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Experience

# HUMAN DEVELOPMENT

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Hill**

**Diane E. Papalia  
Gabriela Martorell**



# EXPERIENCE **Human Development**







# EXPERIENCE **Human Development**

FIFTEENTH EDITION

Diane E. PAPALIA

Gabriela MARTORELL





## EXPERIENCE HUMAN DEVELOPMENT

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# about the authors



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Gabi Martorell

**Gabriela Alicia Martorell** was born in Seattle, Washington, but moved as a toddler to Guatemala. At age 8, she returned to the United States and lived in Northern California until leaving for her undergraduate training at the University of California, Davis. After obtaining her bachelor's degree in Psychology, she earned her PhD in Developmental and Evolutionary Psychology with an interdisciplinary emphasis in Human Development from the University of California, Santa Barbara. She now works as a Professor of Psychology at Virginia Wesleyan University and serves as the co-chair of the Institutional Review Board. Gabi maintains an active teaching schedule and teaches courses in Introductory Psychology, Lifespan Human Development, Infant Development, Child Development, Adolescent Development, Adult Development and Aging, Cross-Cultural Psychology, Evolutionary Psychology, Research Methods and Original Research Project. She is committed to teaching, mentoring, and advising. She recently concluded a 5-year longitudinal National Science Foundation grant focused on the retention of higher education students from traditionally underrepresented groups in science, technology, engineering, and math. She is also a group fitness instructor for the YMCA of South Hampton Roads.





*To Charles Robert Zappa, with love.*

—Diane E. Papalia

*To my parents. Sorry about the teen years.*

*Love you mountains.*

—Gabi Martorell



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This is a chapter-by-chapter list of topics that are new to this edition or have been substantially revised or updated.

## 1 The Study of Human Development

- New information on gatekeeping of scientific thought and research disparities
- Expanded discussion of the concept of childhood across time periods and cultures
- Expanded discussion of and updated statistics on extended families
- New information and updated statistics on single-parent families
- Updated and expanded statistics on global poverty rates
- New information on the influence of COVID-19 on global poverty
- New information on the influence of climate change on global poverty
- New information on the influence of COVID-19 on US poverty rates
- New key terms: individualism and collectivism
- New section on ethnicity and race
- Updated statistics on US demographic trends
- Inclusion of COVID-19 as an example of normative history-graded influences
- New Research in Action feature on intersectionality and inequity in human development

## 2 Theory and Research

- Expanded discussion of positive and negative reinforcement and punishment
- New examples provided for and more discussion of negative reinforcement, negative punishment, and positive punishment
- Expanded discussion of differences between quantitative and qualitative research designs
- New example study provided for cross-sectional design
- New example study provided for longitudinal design
- Expanded section on research issues
- New section on diversity in scientific research

- New Research in Action on diversity in psychological research
- New section on the open science movement and the reproducibility crisis
- New section on research ethics

## 3 Forming a New Life

- New section on cultural beliefs about conception
- New Research in Action on indigenous motherhood
- New section on assisted reproduction technologies
- Updated global and US statistics on multiple births
- Expanded discussion of genetic and chromosomal abnormalities
- Updated statistics and information on Down syndrome
- Revised section on genetic influences on physical health
- Revised section on genetic influences on psychopathology
- New section on cultural beliefs about prenatal development
- New section on perceptual and cognitive development in fetuses
- New information on traditional beliefs about pregnancy
- Updated global statistics on poverty and malnutrition during pregnancy
- New information on folic acid deficiency and anencephaly and spina bifida in Chinese babies
- New example provided for cultural differences in exercising while pregnant
- Updated statistics on opioid use during pregnancy
- New information on cultural barriers to interventions for alcohol use during pregnancy
- Updated statistics on smoking during pregnancy

- New/expanded sections and updated statistics on marijuana, cocaine, and methamphetamine use during pregnancy
- New information on the effect of COVID-19 on global vaccination campaigns
- Updated statistics on measles in the United States
- New information on the influence of COVID-19 on pregnancy outcomes
- Expanded and revised section on maternal emotional state during pregnancy
- Updated global and US statistics on maternal age
- Updated information on disparities in prenatal care

- New information on COVID-19 and breastfeeding
- New section on solid foods
- New section on infant obesity
- New section on malnutrition in infancy and toddlerhood
- New Research in Action on disparities in the use of prenatal care
- New information on hearing in fetuses
- New information on updated motor milestones
- Expanded information on hand control in infancy and toddlerhood
- Expanded information on ethnic and cultural influences on motor development

## 4 Birth and Physical Development during the First Three Years

- Expanded information on childbirth, culture, and change
- Updated statistics on global and US maternal mortality rates, postneonatal death rates, and complications of pregnancy
- Updated statistics and information on cesarean sections
- Updated information on doulas
- New section on childbirth and the COVID-19 pandemic
- Expanded information on cultural differences in infant sleep schedules
- Updated statistics on low-birth-weight and preterm babies
- Revised and updated information on risk factors for and predictors of low birth weight
- Revised and updated information on long-term outcomes of prematurity
- New information on global incidence of stillbirth and updated statistics and information for the United States
- Updated information on racial and ethnic disparities in infant mortality
- New Window on the World on infant sleep customs across cultures
- Updated statistics on accidental deaths in infancy
- Updated statistics and research on global and US levels of immunizations
- New information on vaccine hesitancy
- New information on vaccines and COVID-19
- New information on international variations in vaccine acceptance
- Expanded information on breastfeeding

## 5 Cognitive Development during the First Three Years

- Revised section on conducting research with infants
- New information on cultural differences in HOME inventory relevance and application
- New information on common infant-parent games across cultures
- New information on overimitation
- New information on pictorial representation in infancy and toddlerhood
- Expanded research on cultural differences in learning from books
- New information on differences in picture books in Japan and the United States
- New information on infant understanding of tablet computers and cell phones
- New information on the influence of video calls and interactive media on young children
- New information on cultural differences in scale error
- Revised information on perceptual and attentional processes
- Expanded information on the influence of television on toddlers' development
- New section on cross-modal transfer
- Expanded description of the violation-of-expectations paradigm
- New information on cultural differences in explicit memory systems
- Reorganized and revised section on language development
- New information on the importance of joint attention to language development
- New section on cultural differences in perceptual attunement

- New information on tonal languages
- New information on cultural differences in the use of gestures
- Expanded information on learning nouns and verbs across different languages
- New Research in Action on the strengths-based approach to language development across cultural groups
- New information on socioeconomic differences in language development
- New information on child-directed speech in tonal languages

## 6 Psychosocial Development during the First Three Years

- Revised section on early emotional development
- New research on cross-cultural patterns of infant cry duration
- Revised section on self-conscious emotions, altruistic helping, and empathy
- New section on cultural influences on temperament
- Revised section on the mother's role with expanded content on cultural differences
- Expanded research and information on cultural differences in the father's role
- Revised, updated, and expanded information and research on sex differences in infants and toddlers
- Section on developing attachments reorganized, updated, and revised
- New research on cross-cultural differences in separation anxiety
- New information on cross-cultural research on social referencing
- New research on toddlers' responses to own- versus other-race faces
- New research on cultural differences in the rouge task
- Expanded information on verbal indicators of the development of the self
- New research on neural correlates of self-recognition
- New Research in Action on cultural considerations in the diagnosis of autism
- New section on cultural influences on self-regulation
- New research on cultural differences in eliciting compliance from toddlers
- Revised information on sibling relationships

- New research on sibling relationships across cultures
- New research on cultural differences and commonalities in peer relationships
- Updated statistics and information on working mothers
- New section on cultural variations in early childcare
- Updated statistics and information on child maltreatment
- Expanded research on cultural influences on child maltreatment

## 7 Physical and Cognitive Development in Early Childhood

- Updated statistics on bodily growth and change
- Expanded research on sleep patterns across cultures
- New information on cultural factors related to sleep patterns
- New section on sleep disturbances
- New research on correlates of and cultural influences on sleep disturbances
- New section on bed-wetting
- Revised section on the development of motor skills
- New research on the cross-cultural differences in motor development
- New research on cultural influences on handedness
- New statistics on global and US obesity and overweight
- New information on the influence of COVID-19 on overweight and obesity in children
- New Research in Action on the health risks of screen time during COVID-19
- Updated global and US statistics on food insecurity and malnutrition
- Updated global and US statistics on deaths and accidental injuries
- Sections on socioeconomic status and race/ethnicity revised and updated
- New information on the influence of the COVID-19 pandemic on health care coverage
- Updated global and US statistics on homelessness
- New information on the influence of COVID-19 on homelessness
- Revised section on knowledge about thinking and mental states

- Revised, updated, and expanded section on individual differences in theory of mind development
- New section on cultural differences in theory of mind development
- New section on metamemory
- New section on executive functioning
- New cross-cultural research on parental influences on memory
- New research on the influence of television on cognitive development
- New information on the relationship between poverty and language development
- Revised section on pragmatics and social speech
- New research on the influence of technology and media on emergent literacy
- New section on cultural differences in early education
- Revised section on preschool

## 8 Psychosocial Development in Early Childhood

- New section on race and self-concept
- New Research in Action on BIPOC children's exposure to violent media
- New section on cultural differences in self-concept
- New section on disability and self-concept
- Revised and expanded section on developmental changes in self-esteem
- New section on cultural influences on self-esteem
- New research on cultural differences in mindset
- New section on cultural influences on emotion regulation
- New research on the importance of emotional understanding
- New information on gender as a binary concept and biases in research on gender
- New section on variations in gender identity development
- New key terms: transgender and intersex people
- New information on historical and anthropological evidence of transgender people
- New information on the influence of being gender atypical on peer relationships
- Revised, updated, and expanded introduction to play

- Revised, updated, and expanded section on gender and play
- Expanded research on cross-cultural differences in play
- New section on corporal punishment
- Updated statistics and research on corporal punishment
- New research on cross-cultural differences in disciplinary methods
- New section on cultural differences in parenting styles

## 9

## Physical and Cognitive Development in Middle Childhood

- Updated statistics on physical development in middle childhood
- Updated statistics and revised information on dental health
- Updated statistics and information on eating habits in children
- Expanded information on snoring and sleep apnea
- New section on cross-cultural research on physical activity
- New research on recess across different countries
- Updated statistics on participation in organized sports
- New section on the influence of COVID-19 on physical activity
- Revised and updated statistics on overweight and obesity in middle childhood
- New information on COVID-19 in children and the influence of comorbidities
- Updated statistics on incidence and prevalence of chronic medical conditions
- New international statistics on asthma and updated US statistics
- New international statistics on diabetes and updated US statistics
- New international statistics on hypertension and updated US statistics
- Updated statistics on accidental injuries in middle childhood
- New research on neurological changes associated with Piagetian task performance
- New section on cultural influences on Piagetian task performance
- New section on metamemory

- New research on genetic influences on brain development
- New research on global literacy rates
- Revised and updated information on educational reform
- New research on class size in different countries
- New section on charter schools and homeschooling
- New section on the influence of COVID-19 on education
- New Research in Action on educational access in the age of COVID-19
- Revised and updated section on computer and internet use in classrooms, including new information on COVID-19
- Updated statistics on intellectual and learning disabilities and ADHD

**10**

## Psychosocial Development in Middle Childhood

- Revised, expanded, and updated section on emotional development
- New research on cultural influences on emotional development
- New Research in Action on racial socialization in Black American families
- New section on cultural differences in family dynamics
- New section on family conflict
- Updated statistics on childcare arrangements for working families
- New research on the influence of COVID-19 on employment and family processes
- Updated statistics and research on poverty
- New research on the influence of COVID-19 on poverty rates
- Updated statistics on US and global family structure
- Updated statistics on US and global divorce rates
- New research on divorce in foraging and indigenous cultures
- New section on adjusting to divorce
- Revised section on outcomes of divorce
- Updated US statistics on one-parent families
- Updated US and global statistics on cohabitation
- Updated US and global statistics on gay and lesbian parents

- Updated US and global statistics on adoption
- Revised, expanded, and updated section on peer groups
- New research on peer groups in hunter-gatherer cultures
- New research on the influence of cultural norms on sociometric popularity
- Revised and updated section on aggression and bullying
- Expanded and updated research on cyberbullying
- New section on outcomes of aggression
- Updated statistics and research on disruptive conduct disorders
- Updated statistics and research on anxiety disorders
- Updated statistics and research on childhood depression
- New section on the influence of COVID-19 on child mental health

**11**

## Physical and Cognitive Development in Adolescence

- Revised and updated section on puberty and sexual maturity
- New Research in Action on LGBTQ+ identity development
- New research on historical evidence of and secular trends for pubertal timing
- New research on racial and ethnic variations in pubertal development
- Updated US and global statistics on physical activity in adolescence
- Updated US statistics on sleep duration in adolescence
- Updated US and global statistics on overweight and obesity
- New research on psychological consequences of overweight and obesity
- Updated US and global statistics on anorexia
- Updated US and global statistics on bulimia
- Updated US and global statistics on binge-eating disorder
- New section on diversity and eating disorders
- Updated statistics on US trends in drug use
- New section on alcohol
- Updated US and global statistics on alcohol use in adolescence
- New research on cultural influences on drinking patterns in adolescence

- Updated US statistics on marijuana use and legalization
- Updated US and global statistics on tobacco use
- New research on risk factors for tobacco use in adolescence
- New research and information on e-cigarettes
- New research and information on vaping
- Updated US and global statistics on depression
- New research on the influence of COVID-19 on depression rates
- Updated US and global statistics on death in adolescence
- Revised and updated section on deaths from vehicle accidents
- Updated statistics and research on US and global suicide
- New section on homicide in adolescence
- New research on the influence of social media on the imaginary audience
- New section on culture, religion, and moral reasoning
- Updated statistics on global high school graduation rates
- New section on technological influences on schooling and academics
- New section on the influence of race and ethnicity on academic achievement
- Updated US and global statistics on dropping out of high school
- New section on gender and career choice

**12**

## Psychosocial Development in Adolescence

- New section on identity development in sexual-minority youth
- New section on cultural differences in identity formation
- Updated US statistics on sexual orientation
- Revised, updated, and expanded section on origins of sexual orientation
- Updated US statistics on sexual behavior in adolescence
- New key term: sexting
- New research on sexting
- New section on correlates to adolescent sexual activity
- Updated US and global statistics for contraceptive use in adolescence

- Revised, updated, and expanded section on sexually transmitted infections
- Updated US and global statistics for sexually transmitted infections: human papillomavirus, herpes, hepatitis B, human immunodeficiency virus, chlamydia, and gonorrhea
- New section on viral sexually transmitted infections
- New section on bacterial sexually transmitted infections
- Updated US and global statistics on teen pregnancy and childbearing
- Updated research and information on abstinence-only and comprehensive sexual education programs in the United States
- New Research in Action on LGBTQ+ inclusivity in sexual education
- New section on female genital mutilation
- New section on child marriage
- New research on cultural differences in parent-teen relationships
- New research on the influence of COVID-19 on employment
- Updated statistics on social media and electronics usage in adolescents
- New research on the influence of social media usage on romantic relationships
- Revised and updated section on intimate partner violence
- New research on intimate partner violence in same-sex relationships
- New research on cultural differences in juvenile delinquency

**13**

## Physical and Cognitive Development in Emerging and Young Adulthood

- New research on cross-cultural differences in emerging adulthood
- Updated US and global statistics on health
- New research and information on the risks and consequences of COVID-19 infection in emerging adulthood
- New Research in Action on rheumatoid arthritis in young adults
- Updated US and global statistics on preventable diseases
- Updated US and global statistics on obesity and overweight
- New section on food insecurity

- Updated US statistics on physical activity levels in young adults
- New Window on the World on internet addiction
- Revised and updated section on sleep in emerging adulthood
- Updated US and global statistics on smoking in young adulthood
- New research on global health care expenditures resulting from smoking
- Updated US and global statistics on alcohol use
- New section on the influence of race and ethnicity on health
- New section on health care access
- Revised and updated section on relationships and health
- Updated US and global statistics on alcoholism
- Updated US statistics on drug use
- Updated global statistics on depression
- New research on cross-cultural differences in premarital sex and contraceptive use
- New research and statistics on support for gay marriage
- Updated statistics on sexual orientation in emerging adulthood
- Updated US and global statistics on human immunodeficiency virus
- Updated US and global statistics on sexually transmitted infections
- Revised and updated section on perspectives on adult cognition
- Revised, updated, and expanded section on reflective thinking
- New section on the Three Ethics and cross-cultural differences in moral reasoning
- Updated statistics on college participation in emerging adults
- Updated US and global statistics on entering the workforce in emerging adulthood

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## Psychosocial Development in Emerging and Young Adulthood

- New section on religious identity formation
- New section on sexual and gender identity formation
- Revised and updated section on trait models of personality
- Updated US and global statistics and information on failure to launch
- New Research in Action on interracial dating

- New research on anthropological evidence for romantic love across cultures
- Updated statistics on single life in the United States
- Updated US and global statistics and information on nonheterosexual relationships
- Revised and updated section on cohabitation
- Updated US and global statistics on cohabitation
- New section on cultural and contextual influences on marriage
- New research and information on bride price and dowries
- New research and information on arranged marriages
- New section on global marriage trends
- Revised, updated, and expanded section on marriage satisfaction
- New section on extramarital sexual activity
- New section on cultural and contextual influences on parenthood
- New research on cross-cultural differences in work-life balance
- New section on gender differences in parenting
- New cross-cultural research on the influence of parenting on marriage satisfaction
- Updated US statistics on divorce
- Updated and expanded research on predictors of divorce
- New research on divorce in same-sex couples
- Updated US statistics for remarriage and stepparenthood

**15**

## Physical and Cognitive Development in Middle Adulthood

- Updated US and global statistics on visual impairment
- Updated US and global statistics on hearing loss
- Updated US statistics on losses in taste and smell
- New section on physical fitness
- New section on infertility
- Revised and updated section on changes in male sexual functioning
- Updated US and global statistics on hypertension
- Updated US and global statistics on heart disease
- Updated US and global statistics on diabetes
- New research and information on COVID-19 infections at midlife

- New research on adherence to dietary guidelines, smoking, and vaccination status
- New research and information on health disparities in BIPOC people
- Updated US and global statistics on osteoporosis
- Updated US and global statistics on breast cancer
- Revised and updated section on mental health at midlife
- Updated US statistics on the incidence of depression and depressive symptomatology
- New research and information on COVID-19 and stress responses
- New research on the relationship between personality variables and health
- Updated US statistics on retirement
- New research on the influence of COVID-19 on retirement
- New Research in Action on financial stress at midlife
- Updated US and global statistics on literacy

## 16 Psychosocial Development in Middle Adulthood

- Revised, updated, and expanded section on change at midlife
- New section on cultural influences on generativity
- New section on culture and personality
- Revised, updated, and expanded section on identity process theory
- New Research in Action on body image and well-being at midlife
- New research on cultural influences on identity processes
- Revised, updated, and expanded section on positive mental health at midlife
- New section on emotional influences on well-being
- New section on religiosity and well-being
- New research on cultural differences in social convos
- New section on arranged marriages
- Revised and updated section on gay and lesbian relationships
- Updated US and global statistics on cohabitation at midlife
- Updated US and global statistics on divorce at midlife

- New research on divorce in indigenous populations
- Revised and updated section on parenting adolescent children
- New research on helicopter parenting
- New research on the empty nest across cultures
- New section on voluntary childlessness
- Updated US and global statistics on caring for aging parents
- New section on cultural and ethnic differences in caregiving
- Updated US statistics on caregiving for aging parents
- New section on cultural and ethnic differences in grandparenting

## 17 Physical and Cognitive Development in Late Adulthood

- Updated US and global statistics on aging populations
- Updated US statistics on life expectancy
- New research on the effect of COVID-19 on life expectancy
- Updated US and global statistics on gender differences in mortality rates and life expectancy
- Revised and updated section on regional differences in mortality risk
- New research on COVID-19 and mortality risk
- Revised and updated section on racial and ethnic differences in mortality risk
- Revised, updated, and expanded section on extending the human lifespan
- Updated US and global statistics on visual loss at midlife, including the use of glasses, and cataracts, macular degeneration, and glaucoma
- Updated US and global statistics on hearing loss
- New Research in Action on the psychological consequences of hearing loss
- Updated US statistics on falls in late adulthood
- New section on COVID-19 risk and age
- Updated US and global statistics on chronic health conditions
- Updated US statistics on hypertension, diabetes, arthritis, heart disease, and cancer
- New research on gender differences in disability status
- New section on periodontal disease
- Updated US and global statistics on depression
- Updated US and global statistics on dementia

## Psychosocial Development in Late Adulthood

- Revised and updated section on personality traits in old age
- New section on well-being in sexual minorities
- Revised and updated section on the influence of religion and spirituality on well-being
- New section on aging and job performance
- Updated US and global statistics on retirement
- Updated US and global statistics on retirement benefits
- New research on the influence of COVID-19 on retirement
- Updated US statistics on Medicare usage and poverty rates in women and BIPOC
- Updated US and global statistics on living arrangements in late adulthood
- New Research in Action on technology and aging-in-place
- Updated US and global statistics on institutional care for the elderly
- New section on elder abuse
- Updated US and global statistics on multigenerational family living arrangements
- New section on LGBTQ+ relationships in late adulthood
- Updated US and global statistics on single living and dating in late adulthood
- Updated US and global statistics on cohabitation in late adulthood
- Updated US and global statistics on childlessness in late adulthood

## Dealing with Death and Bereavement

- Updated US and global statistics on cause of death
- Revised and updated section on facing death and loss
- New section on near-death experiences
- New research on Prolonged Grief Disorder
- New Research in Action on cultural variations in conceptions of death
- Revised, updated, and expanded section on responses to death across the lifespan
- New section on responses to death in infancy and childhood
- New research on children affected by parental death due to COVID-19
- New section on responses to death in adolescence
- Updated US and global statistics on suicide
- Revised, updated, and expanded section on assisted suicide
- Revised, updated, and expanded section on international variations in end-of-life decisions
- New section on end-of-life options and diversity concerns
- Updated example of the lifelong process of development

# guide to diversity, equity, and inclusion

People's experiences shape their understanding of the world, and if most research is carried out within only one frame of reference, we risk misunderstanding or minimizing the influence of diverse experiences and thus misrepresenting human psychology. Thus, information in this text draws on research from a wide variety of journals dedicated to investigating the diversity of human psychology. This includes such journals as the *Journal of Cross-Cultural Psychology; Cross-Cultural Research; Psychology and Culture; Cultural Diversity and Ethnic Minority Psychology; American Psychologist; American Journal of Community Psychology; American Sociological Review; Social Policy Report; American Ethnologist; Ethnology; American Anthropologist; Cultural Anthropology; Annual Review of Anthropology; Psychological Anthropologist; International Journal of Intercultural Relations; Journal of Intercultural Relations, Learning, and Individual Differences; International Journal of Psychological Studies; Journal of International Women's Studies; International Journal of Psychology; International Journal of Behavioral Development; Sex Roles; GLQ: Journal of Lesbian and Gay Studies; Sexualities; The Journal of Sexual Medicine; Journal of Intellectual Disability Research; Journal of Communication Disorders; Journal of Attention Disorders; Journal of Affective Disorders; Journal of Autism and Developmental Disorders; Obesity Review; Obesity; Childhood Obesity; and Birth Defects Research.*

Organizations focused on research relevant to diverse populations are also used. This includes the World Bank, the Migration Policy Institute, the Centers for Disease Control and Prevention, the Wilson Sheehan Lab for Economic Opportunity, the Global Nutrition Report, the Guttmacher Institute, the Brookings Institute, and the Pew Research Center.

Last, as follows, studies and researchers representing diverse national and international samples and issues are also included.

## 1 The Study of Human Development

- Discussion of gatekeeping of scientific thought and the importance of diverse voices for scientific integrity
- Discussion of varying conceptions of childhood and adolescence over cultures, time, and place
- Diversity in family structure, with research from Pew Research Center (2015), Kramer et al. (2019), Kramer (2020), Bradbury et al. (2014), Kinsella & Phillips (2005), and Cohn & Passel (2018)
- Poverty and the disproportionate effect of the COVID-19 pandemic on BIPOC people and low- and middle-income countries, including data collected by Lakner et al. (2021), the World Bank Organization (2022), Han et al. (2021), and Parolin et al. (2021)
- Culture, definition and discussion
- Collectivism versus individualism

- Ethnic group, definition and discussion, with data on demographic changes by Alba (2018), Vespa et al. (2018), and Colby & Ortman (2015)
- Black Lives Matter (BLM) movement
- BIPOC, definition
- Race as an important social category and influence, with research from Yudell et al. (2019) and Ossorio & Duster (2005)
- Ethnic gloss, definition
- Children of immigrant families, highlighting research conducted by Budiman (2020), Budiman et al. (2020), Camarota & Ziegler (2016), the Migration Policy Institute (2020), Capps et al. (2016), Kaiser Family Foundation (2020), Grenier (2014), and Jacobi (2012)
- Intersectionality, definition and discussion
- Discussion of the gender, sexuality, and race/ethnicity pay gap, with research from AAUW (2020), Saenz & Sparks (2020), James et al. (2017), James & Salcedo (2017), and Pedulla (2014)

**2**

## Theory and Research

- Vygotsky's sociocultural theory
- WEIRD (Western, educated, industrialized, rich, and democratic) samples and the importance of including diverse, non-WEIRD samples in psychological research
- Ethnographic studies
- Importance of cross-cultural research for determining universality
- Diversity in research, with information drawn from Roberts et al. (2020), Wu (2020), Swartz et al. (2019), and AlShebli et al. (2018)
- BIPOC psychologists and the scientific enterprise, with research from Settles et al. (2020), Cheon et al. (2020), Carey et al. (2020), DiAngelo (2018), Buchanan et al. (2020), Roberts et al. (2020), and Henrich et al. (2010)

**3**

## Forming a New Life

- Cultural beliefs about conception and fertility, including anthropological and historical data collected by Delaney (1991), Gélis & Morris (1991), Weiner (1988), Meigs & Meigs (1984), Montgomery (1974), DeLoache & Gottlieb (2000), and Bean & Shrestha (2020)
- Indigenous motherhood, with research from Palacios & Portillo (2009), Palacios et al. (2012), Schultz & Noyes (2020), Landers et al. (2017), and Reid (2020)
- Artificial reproductive technologies, with global data collected by the European Society of Human Reproduction and Embryology (2020), Kushnir et al. (2017), and Blencowe et al. (2013)
- Global statistics on multiple births, with research from Heino et al. (2016) and Lim (2011)
- Rates of genetic disorders by race/ethnicity, with research from Mai et al. (2019) and Wang et al. (2015)
- Down syndrome, with information from the Centers for Disease Control and Prevention (2021), Mai et al. (2019), Smith et al. (2020), Ruiz-Gonzalez et al. (2019), Lukowki et al. (2019), O'Leary et al. (2018), and de Graaf et al. (2015)
- Cultural beliefs about conception and fertility, including anthropological and historical data collected by Withers et al. (2018), Liamputpong et al. (2005), Choudry (1997), Cosminsky (1982), Pierroutsakos (2000), Okka et al. (2016), Sokoloski (1995), and Maimbolwa et al. (2003)
- Adoption; racial and ethnic diversity in, disabilities and special health care needs, and same-sex parents, with data collected by the

US Department of State (2020) and Kreider & Lofquist (2014)

- Fetal auditory preference for native language and early vocalizations, with research from Pino (2016) and Wermke et al. (2016)
- Folk beliefs about pregnant mothers, with anthropological data collected by Gottlieb (2016)
- Malnutrition, global data and relationship to poverty, conflict, and climate change, with data and research from the World Health Organization (2020), Ritchie & Roser (2017), Martorell & Zogrone (2012), and Berry et al. (1999)
- Working during pregnancy in the Ifaluk, with research from Le (2000)
- Fetal alcohol syndrome, global data, with research from Tsang & Elliot (2017), Popova et al. (2018), Sacks et al. (2015), and Petrenko & Alto (2017)
- Smoking during pregnancy, global data, with research from Reece et al. (2019), Rauh et al. (2004), Froelich et al. (2009), and Mook-Kanamori et al. (2010)
- The influence of maternal emotional state on pregnancy across different countries, with research from Bor et al. (2014), Glover et al. (2018), and Preis et al. (2021)
- Maternal age during pregnancy, global data, with research from the United Nations (2019), OECD Family Database (2019)
- Consequences of prenatal genetic testing across countries, with research from Loane et al. (2013) and Hill et al. (2017)
- Prenatal care around the world, with research from the United Nations (2020), the World Health Organization (2019), UNICEF Millennium Development Goals (2015), and Townsend et al. (2021)

**4**

## Birth and Physical Development during the First Three Years

- Cultural customs and beliefs about childbirth, with research from Lozoff et al. (1988), Behruzi et al. (2013), Yadollahi et al. (2018), Liambuttong (2007), Lozoff et al. (1988), Holmes (1994), Konner & Shostak (1987), Jordan (1993), Barnes (1949), Fontanel & d'Harcourt (1997), Kaewesarn et al. (2003), McGilvray (1982), Gardiner & Kozmitzki (2005), Saunders (1997), and Scholten (1985)
- Racial and ethnic disparities in childbirth risk and maternal mortality, with research from Tikkanen et al. (2020), Lu (2018), and the Centers for Disease Control and Prevention (2020)

- Childbirth in developing countries, with research from Sines et al. (2007) and the World Health Organization (2019)
- Cesarean childbirth, global data, with research from Betran et al. (2021) and Sobhy et al. (2019)
- Doulas, racial, ethnic, and socioeconomic disparities, with research from Kozhimannil et al. (2016), Strauss et al. (2015), and Bryant et al. (2010)
- Infant sleep schedule variations across cultures, with research from Broude (1995), Konner (2017), Mindell et al. (2013), Grandner et al. (2016), and Mindell et al. (2010)
- Low birth weight and outcomes, global data and comparisons, with research from Blencowe et al. (2019), the World Health Organization (2019), Martin et al. (2019), Molitoris et al. (2019), Ostermann et al. (2022), and Giscombe & Lobel (2005)
- Stillborn births, global data, with research from Hug et al. (2020) and Dongawar et al. (2020)
- Stillborn births, racial and ethnic data, with research from Gregory et al. (2018) and McDorman & Gregory (2015)
- Infant mortality, global data, with research from UNICEF (2021) and United Health Foundation (2021)
- Infant mortality, racial, ethnic, and regional differences, with research from Kamal et al. (2019), Ely & Driscoll (2020), Singh & Stella (2019), Lorch & Enlow (2016), Creanga et al. (2017), and Liu & Glynn (2021)
- Infant sleep customs across the world, with research from Konner (2017), Barry & Paxson (1971), Morelli et al. (1992), Colson et al. (2013), Bombard et al. (2018), and Marinelli et al. (2019)
- Accidental deaths, racial and ethnic disparities, with research from the Centers for Disease Control and Prevention (2021) and Hauck et al. (2011)
- Vaccinations, global data, with research from the World Health Organization (2020, 2021)
- Vaccination hesitancy, global research from Machingaidze & Wiysonge (2021)
- Indigenous beliefs about teething in infancy, with research from Fontanel & d'Harcourt (1997), Garve et al. (2016), and Elgamri et al. (2018)
- Breastfeeding, global data, with research from the World Health Organization (2021) and Global Breastfeeding Collective et al. (2018)
- Breastfeeding, racial, ethnic, and socioeconomic differences, with research from McKinney et al. (2016), Dinour & Szaro (2017), Bentley et al. (2003), Dagher et al. (2016), and Hurley et al. (2008)
- Obesity in infancy, racial and ethnic differences, with research from Fryar et al. (2018), Isong et al. (2018), and the World Health Organization (2021)
- Malnutrition, global data and discussion, with research from the World Health Organization (2021), UNICEF (2021), US Department of Agriculture (2022), and Martorell (2016)
- Parental leave, disparities, with research from Jou et al. (2018), Plotka & Busch-Rossnagel (2018), Neckermann (2017), Armenia & Gerstel (2006), and Vohra-Gupta et al. (2020)
- Enriched environments and interventions for children with special needs, with research from Guzzetta et al. (2011), Cue & Dierssen (2020), and Morgan et al. (2013)
- Cultural programming of taste perception, with research from Cooke & Fildes (2011), Ventura & Worobey (2013), Dunn & Lessen (2017), and Paroche et al. (2017)
- Calibration of auditory processes as a function of exposure to native language and music, with research from Minagawa-Kawai et al. (2010), Virtala et al. (2013), and Soley & Hannon (2010)
- Hearing loss in infancy, global data, with research from Shibani Kanungo & Patel (2016)
- Infant visual categorization of own-race and other-race faces, with research from Liu et al. (2015) and Xiao et al. (2013, 2018, 2018)
- Ethnic and cultural influences on motor development, with research from Kelly et al. (2006), Mendonça, et al. (2016), Karasik et al. (2015), Venetsanou & Kambas (2010), Hopkins & Westra (1990), Lancy (2015), Krige (1965), Higgins (1985), Edwards & Liu (1995), Kaplan & Dove (1987), Mendonca et al. (2016), WHO Multicentre Growth Reference Study Group & de Onis (2006), and Ertem et al. (2018)

## 5

### Cognitive Development during the First Three Years

- HOME inventory and the appropriateness of its use across different cultures, with research from Bradley et al. (1996), Fernald et al. (2017), Bradley et al. (2001), Nahar et al. (2012), Straus (2010), and Ember & Ember (2005)
- Differences in imitative abilities in infants cross-culturally, with research from Goertz et al. (2011) and Buttelmann et al. (2013)
- Cross-cultural evidence of overimitation in children, with research from Hoehl et al. (2019)
- The effect of cultural experiences on learning from picture books in toddlers, with research from Walter (2012) and Callaghan et al. (2012)

- Cross-cultural differences in picture book content, with research from Kuwabara et al. (2020)
- Holistic versus analytical styles of visual processing, with research from Buchtel & Norenzayan (2009)
- The influence of culture on explicit memory, with research from Kolling et al. (2016), Goertz et al. (2011), Graf et al. (2014), and Graf et al. (2012)
- The social constructivist approach and guided participation, with research from Ball (2003), Göncü et al. (2000), Rogoff (2003), Rogoff et al. (1993), and Weisberg et al. (2016)
- Acoustic differences in infant cries from different cultures, with research from Mampe et al. (2009), Wermke et al. (2016), and Manfredi et al. (2019)
- Perceptual commitment to native language in toddlers, with research from Kuhl (2014), Byers-Heinlein et al. (2010), Kuhl et al. (1992), Gervain & Mehler (2010), Kuhl & Rivera-Gaxiola (2008), Tsao et al. (2004), and Kuhl et al. (2005)
- Cultural differences in perceptual development in tonal and nontonal languages, with research from Singh & Fu (2016), Yeung et al. (2013), Tsao (2017), Liu & Kager (2014), and Krishnan et al. (2010)
- Infant responses to lullabies from different cultures, with research from Bainbridge et al. (2021)
- Cultural differences in gesture use in toddlers, with research from Kwon et al. (2018), Iverson et al. (2008), and Salomo & Liszkowski (2013)
- Noun and verb learning in different languages, with research from Bornstein et al. (2004) and Imai et al. (2008)
- Language and sign development in deaf children, with research from Lederberg et al. (2013), Petitto & Marentette (1991), Petitto et al. (2001), Hoffmeister & Wilbur (2017), and Kuhl (2010)
- Bilingual language development, with research from Petitto & Kovelman (2003), Hoff (2006), and Barac et al. (2014)
- Code switching, with research from Genesee et al. (1995) and Yow et al. (2018)
- Strengths-based approach to bilingualism, with research from Buchanan et al. (2021), Shieffelin & Ochs (1986), and Adamson et al. (2021)
- The role of social interaction in language learning, with research from Kuhl & Rivera-Gaxiola (2008)
- Language development in children from different socioeconomic statuses, with research from Fernald & Weisleder (2015), Pace et al. (2017), and Barbu et al. (2015)

- Child-directed speech across cultures, with research from Kuhl et al. (1997), Kitamura et al. (2001), Cooper & Aslin (1990), and Ferguson (1964)
- Child-directed speech in tonal languages, with research from Kitamura (2014)
- Cross-cultural differences in linguistic environments, with research from Cristia et al. (2019), Polak (2012), and Richman et al. (2010)
- Reading to children across different cultures

## 6

### Psychosocial Development during the First Three Years

- Cross-cultural responses to infant cries, with research from Bornstein et al. (2017)
- Universality of infant cries across cultures, with research from Wolke et al. (2017) and Barr et al. (1991)
- Collaborative activities and cultural transmission, with research from Hoehl et al. (2019), Tomasello & Moll (2010), Stengelin et al. (2019), and Nielson et al. (2014)
- Cultural belief systems and their effect on infant temperament, with research from Putnam & Gartstein (2017)
- Cultural influences in the interpretation of infant temperament style, with research from Montirossi et al. (2011), Cozzi et al. (2013), Sung et al. (2015), Farkas & Valloton (2016), Gartstein et al. (2016), Gartstein et al. (2010), and Dragan et al. (2011)
- Cultural beliefs about language in infants, with research from DeLoache & Gottlieb (2000)
- Infant care in foraging or pastoralist cultures, with research from Lancy (2015) and LeVine & LeVine (2016)
- Maternal care in hunter-gatherer cultures, with research from Lancy (2015), Hill & Hurtado (1996), LeVine & LeVine (1988), and Konner (2017)
- The influence of child mortality rates on childcare in hunter-gatherer and agricultural cultures, with research from LeVine (1994) and Hewlett et al. (1998)
- Paternal infant care patterns across cultures, with research from Konner (2017), Menon (2001), Lancy (2015), Jankowiak (1992), and Hewlett (1992)
- Cultural factors affecting father involvement, with research from Hewlett & Macfarlan (2010) and Barry & Paxson (1971)
- Variations in who fills the paternal role across cultures, with research from Engle & Breaux (1998) and Townsend (1997)

- Sex differences in empathy, with research from Hoffman (1977) McClure (2000), Rennells & Cummings (2013), Zahn-Waxler et al. (1991), and McHarg et al. (2019)
- Sex differences in aggression, with research from Chaplin & Aldao (2013), Baillargeon et al. (2007), and Moller & Serbin (1996)
- Discussion of innate and socialization influences on gender-role preferences for toys, with research from Alexander et al. (2008), Davis & Hines (2020), Jadva et al. (2010), LoBue & DeLoache (2011), Weisgram et al. (2014), and Lamminmaki et al. (2012)
- Differences in processing of visual information in toddler boys and girls, with research from Quinn & Liben (2014), Wilcox et al. (2012), Lourenco et al. (2011), and Newcombe (2020)
- Gendered treatment of infants, with research from Reby et al. (2016), Mondschein et al. (2000), Brown et al. (2015), Snow et al. (1983), Lamb (1981), Lewis & Lamb (2003), Kelley et al. (1998), Lindsey et al. (2010), and Leaper et al. (1998)
- Cultural influences on infant-parent play styles, with research from Lamb et al. (1982), Roopnarine et al. (1993), Tronick et al. (1992), and Roopnarine & Davidson (2015)
- The universality of infant attachment, with research from Mesman et al. (2016) and van IJzendoorn & Sagi (1999)
- Emergence and patterns of separation anxiety and stranger anxiety across different cultures, with research from Ainsworth et al. (1978), Kagan (1976), Chisholm (2017), Lester et al. (1974), Jacobson & Wille (1984), and Sagi et al. (1991)
- Cultural influences on the development of interactional synchrony, with research from Kärtner et al. (2010)
- Discussion of possible cross-cultural influences on social referencing, with research from Fawcett & Liszkowski (2015)
- The development of own-race face preferences in infants and toddlers, with research from Kelly et al. (2005), Kelly et al. (2007), Liu et al. (2015), Xiao et al. (2018), Quinn et al. (2016), and Lee et al. (2018)
- Cultural values and varying timelines of self-recognition across cultures, with research from Kärtner et al. (2012), Broesch et al. (2011), Keller et al. (2005), and Keller et al. (2004)
- Cultural variations in the “terrible twos,” with research from Mosier & Rogoff (2003)
- Cultural considerations in the diagnosis of autism, with research from Matson et al. (2011), Stoll et al. (2021), Harrison et al. (2017), Rea et al. (2019), Fong et al. (2017), and Wright (2019)
- Cultural values and their influence on the development of self-regulatory capacity, with research from LeCuyer & Zhang (2015), Feldman et al. (2006), and Jaramillo et al. (2017)
- Beliefs about the independent and interdependent views of the self and their influences on socialization processes, with research from Trommsdorff et al. (2012) and Rothbaum & Wang (2010)
- Cultural beliefs about the role of confrontations and conflict on child socialization processes, with research from Levine & Levine (2016)
- Cultural differences in infant care and sibling attachment, with research from LeVine & LeVine (2016), Samuels (1980), Stewart (1983), and LeVine et al. (1994)
- Cultural beliefs and their influence on peer relationships, with research from Chen et al. (2014), Chen et al. (2006), Gray (2011), Lew-Levy et al. (2018), and Hay et al. (2018)
- Consequences of COVID-19 on maternal employment, with research from Bateman & Ross (2020) and the US Bureau of Labor Statistics (2021)
- Cultural variations in early childcare, with research from UNICEF (2019), Roopnarine (2011), Tobin et al. (1989), Tobin (2005), and Hess & Azuma (1991)
- Global estimates of child maltreatment, with research from the World Health Organization (2020)
- Cultural conceptions of what constitutes abuse or neglect, with research from the International Society for the Prevention of Child Abuse and Neglect (2008) and Stoltenborgh et al. (2013)
- Cultural differences in rates of physical abuse and conceptions of what constitutes abuse, with research from Viola et al. (2016) and Korbin & Spilsbury (1999)
- Cultural values associated with child abuse, with research from the World Health Organization (2020), Lansford et al. (2015), and Celis (1990)

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### Physical and Cognitive Development in Early Childhood

- Variations in sleep patterns and sleep disturbances in children across cultures, with research from Broude (1995), Jenni & O'Connor (2005), Mindell et al. (2013), Jeon et al. (2021), and Sadeh et al. (2011)
- Sleep disturbances in children from Asian and Western countries, with research from Sadeh et al. (2011)

- Cultural variations in motor activity and their influence on motor development, with research from Chow et al. (2001), Victora et al. (1990), and Bardid et al. (2015)
- Cultural differences affecting motor development, with research from Chow et al. (2001) and Al-Naquib et al. (1999)
- Obesity and overweight, global data, with research from the World Health Organization (2021) and Chung et al. (2016)
- Obesity and overweight and variations by race/ethnicity and socioeconomic status in the United States, with research from Hales et al. (2017), Ogden et al. (2010), and Skinner et al. (2018)
- Effect of COVID-19 on overweight and obesity in children from urban and low-income homes, with research from Rundle et al. (2020), Conti (2020), Tandon et al. (2012), and Ribner et al. (2021)
- Food insecurity, with research from the Federal Interagency Forum on Child and Family Statistics (2021).
- Undernutrition across the globe, including wasting, stunting, and hidden hunger, with research from the World Health Organization (2021), UNICEF (2021), Martorell et al. (2010), and Liu et al. (2003)
- Socioeconomic differences in allergy risk for children across cultures, with research from Loh & Tang (2018) and Uphoff et al. (2015)
- Accidental injury and death, global data, with research from UNICEF (2021), Thakrar et al. (2018), Murphy et al. (2021), and Sengelge et al. (2011)
- The influence of socioeconomic status and poverty on health care access and utilization, with research from Murray et al. (2013), the Federal Interagency Forum on Child and Family Statistics (2021), Keisler-Starkey & Bunch (2020), Bundorf et al. (2021), Fry-Bowers (2021), and McMorrow et al. (2020)
- BIPOC access to health insurance and health care, with research from Alker & Roygardner (2019), Artiga et al. (2020), and Bernstein et al. (2021)
- Relationship of race/ethnicity and chronic health conditions in children, with research from Isong et al. (2018), Urquhart & Clarke (2020), Mayer-Davis et al. (2017), the Federal Interagency Forum on Child and Family Statistics (2021), and Cheng & Goodman (2015)
- Poverty, homelessness, and consequences for children, with research from the National Coalition for the Homeless (2020), Gultekin et al. (2020), the Federal Interagency Forum for Child and Family Statistics (2021), and Bassuk et al. (2015)
- Racial/ethnic disparities and poverty in children's exposure to environmental pollutants, with research from the Federal Interagency Forum on Child and Family Statistics (2020)
- Global health in the first five years of life, with research from UNICEF (2021, 2020, 2015) and Hug et al. (2018)
- The influence of COVID-19 on the jobless rates in low-income families, with research from the Children's Defense Fund (2020) and Mitchell (2021)
- Exposure to environmental pollution in African American children, children living in poverty, and children living in urban or agricultural centers, with research from the Federal Interagency Forum on Child and Family Statistics (2021)
- Blood lead levels in BIPOC children, with research from the Federal Interagency Forum on Child and Family Statistics (2021)
- The relationship between socioeconomic status and early number skills, with research from Siegler (2009) and Aragon-Mendizabal et al. (2017)
- Religion and children's beliefs about magic, with research from Corriveau et al. (2015) and Woolley & Cox (2007)
- The influence of bilingualism on theory of mind development, with research from Schroeder (2018)
- Variations and similarities in theory of mind development in children across cultures, with research from Devine & Hughes (2014), Oberle (2009), Avis & Harris (1991), Callaghan et al. (2005), Liu et al. (2008), Mayer & Trauble (2013), Shahaeian et al. (2014), Wellman et al. (2006), and Devine & Hughes (2014)
- Formal schooling and theory of mind development, with research from Vinden (1999), Hughes et al. (2014), and Lecce & Hughes (2010)
- Language variations and their influence on theory of mind, with research from Lee et al. (1999) and Kobayashi et al. (2007)
- Parental cultural beliefs and their influence on theory of mind development, with research from Hughes et al. (2018), Nisbett (2004), and Fu et al. (2008)
- Cross-cultural variations in parental elaborative styles and their influence on children's autobiographical memory, with research from Fivush & Haden (2006) and Nelson & Fivush (2004)

- Secular trends in children's IQ in industrialized countries, with research from Flynn (1984, 1987), Sundet et al. (2004), Teasdale & Owen (2008), and Trahan et al. (2014)
- The influence of socioeconomic status and poverty on IQ, with research from Strenze (2007), Falk et al. (2021), Jensen et al. (2017), Jung et al. (2018), Kim-Cohen et al. (2004), and Hanscombe et al. (2012)
- The effect of social services in different countries on heritability estimates of intelligence, with research from Turkheimer et al. (2003) and Tucker-Drob & Bates (2016)
- Socioeconomic status and language development, with research from Hart & Risley (2003) and Fernald et al. (2013)
- Gender differences in conversational style in children, with research from Leman et al. (2005) and Cook-Gumperz & Symanski (2001)
- Speech and language delays, with research from Black et al. (2015), McLaughlin (2011), Sunderaj & Kanhere (2019), Anne et al. (2017), Franken et al. (2012), Mountford & Newbury (2019), Adani & Cepanec (2019), and Rice et al. (2008)
- Global data and discussion on cultural variations in preschool for young children, with research from UNICEF (2019), Rentzou et al. (2019), Roopnarine (2011), Tobin et al. (1991), and Tobin et al. (2009)
- The influence of compensatory preschool programs on poor and BIPOC children, with research from the Administration for Children and Families (2019), Ludwig & Phillips (2007), Puma et al. (2012), McCoy et al. (2017), Schweinhart (2007), Reynolds et al. (2011), Brooks-Gunn (2003), Zigler & Styfco (2001), and Dietreichson et al. (2020)
- Correlates of repeating kindergarten, with research from Winsler et al. (2012), Malone et al. (2006), and Mendez et al. (2014)

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## Psychosocial Development in Early Childhood

- Race and self-concept, with research from Clark & Clark (1965), Byrd et al. (2017), and Spencer (2010)
- The influence of racism on health, academic achievement and well-being, with research from Saleem et al. (2020), Carter et al. (2017), and Benner et al. (2018)
- BIPOC children's exposure to violent media, with research from Nieman (2003), Costello & Klein (2019), Prot et al. (2017), and Dennis (2014)

- Differential socialization parental practices for children of BIPOC status, with research from Hughes et al. (2006)
- The influence of the collectivism-individualism dimension on the understanding of the self, with research from Oyserman et al. (2002) and Wang et al. (2010)
- Variations in descriptions of the self and pictures drawn by children from different cultures, with research from Wang (2004), Gernhardt et al. (2014), DeMaree & Morrison (2012), Rübeling et al. 2011, and Gernhardt et al. (2016)
- The impact of disability status on global and domain-specific self-concept, with research from Chapman (1988), Hall & Hill (1996), Shields et al. (2006), Miyahara & Piek (2006), Fox (2002), and Bear et al. (2002)
- The influence of collectivism-individualism on self-esteem in children, with research from Harwood et al. (2001), Miller et al. (2002), Stevenson et al. (1990), Heine et al. (1999), and Luo et al. (2013)
- Gender differences in self-esteem across cultures, with research from Zeigler-Hill & Myers (2012), Bleidorn (2016), Tropp & Wright (2003), and Wang & Ollendick (2001)
- Mindset and cultural differences in parenting beliefs and their relationship to academic achievement, with research from Shimahara (1986), Stigler & Stevenson (1994), and Ng et al. (2019)
- How cultural values influence the expression of emotions, with research from Fung et al. (2018), Heikamp et al. (2013), Camras et al. (2006), and Furukawa et al. (2012)
- White, cisgender bias in early work on gender and sexuality, with research from Zosuls et al. (2011)
- Gender differences in physical activity, academic and cognitive tasks, and language use, with research from Archer (2004), Baillargeon et al. (2007), Pellegrini & Archer (2005), Nielson et al. (2011), Miller & Halpern (2014), Ardila et al. (2011), Nisbett et al. (2012), Spelke (2005), Lauer et al. (2019), Miller & Halpern (2014), Halpern et al. (2007), Bornstein et al. (2004), Eriksson et al. (2012), Wallentin (2009), Rutter et al. (2004), Leaper & Smith (2004), and Voyer & Voyer (2014)
- The influence of gender roles on gender development, with research from Iervolino et al. (2005) and Campbell et al. (2004)
- Brain differences as a function of gender, with research from Ruigrok et al. (2014), Polunina & Byrun (2017), Zaidi (2010), Kaczkurkin et al. (2019), and Nguyen et al. (2019)

- Hormonal influences on gender development, with research from Roselli (2018), Auyeng et al. (2009), Eisenegger et al. (2011), Turanovic et al. (2017), Pasterski et al. (2011) and Berenbaum et al. (2012)
- Key terms: transgender, intersex and gender dysphoria
- Historical and cross-cultural reports of transgender identity, with research from Zucker (2017), Denny (1996), Martin & Vorhees (1975), Devereux (1937), Towle & Morgan (2002), and Goel (2016)
- Biological variations associated with being transgender, with research from Leinung & Wi (2017), Diamond (2013), Heylens et al. (2012), and Nguyen et al. (2019)
- “Bathroom bills” and transgender people, with research from Maza (2014) and the Office for Justice Programs (2014)
- The influence of traditional gender-role beliefs and household division of labor on children, with research from Kollmaver et al. (2018), Ruble et al. (2006), Sandnabba & Ahlberg (1999), Fagot et al., (2000), Tenenbaum & Leaper (2002), Dawson et al. (2016), and Halpern & Perry-Jenkins (2016)
- The influence of same-sex parents on gender-typing of children, with research from Goldberg et al. (2012) and Goldberg & Garcia (2016)
- Gender atypicality and risk of bullying, with research from Weber et al. (2019), Zosuls et al. (2016), and Lee & Troops-Gordon (2011)
- Social learning theory as an explanatory tool for the role of cultural influences on gender, with research from Skinner (1989) and Spinner et al. (2018)
- Children’s storybooks and gender stereotypes, with research from McCabe et al. (2011), Hamilton et al. (2006), Anderson & Hamilton (2005), and Fitzpatrick & McPhearson (2010)
- Children’s textbooks and gender stereotypes, with research from Deckman et al. (2018), Islam & Asadullah (2018), Incikabi & Ulosoy (2019), Incikabi & Ulosoy (2019), and Concordia (2018)
- Television and the transmission of cultural attitudes on gender, with research from Collins (2011), Eisend (2010), Wallis (2011), Martin (2017), Sink & Mastro (2017), and Kimball (1986)
- Movies and the transmission of cultural attitudes on gender, with research from Smith et al. (2010), Aley & Hahn (2020), England et al. (2011), and Coyne et al. (2016)
- Research and discussion on gender segregation in young children across cultures, with research from Smith (2005), Lew-Levy et al. (2018), and Martin et al. (2011)
- Gender segregation and gender differences in play, with research from Bjorklund & Pellegrini (2002), Goble et al. (2012), Cote & Bornstein (2009), Fabes et al. (2003), and Pellegrini & Archer (2005)
- How gender and cultural salience influence children’s play styles, with research from Hilliard & Liben (2010)
- Developmental changes and cultural differences in sex-typed toy preferences, with research from Pasterski et al. (2011), Golombok et al. (2008), and Todd et al. (2018)
- The influence of cultural values on beliefs about the importance of play, with research from Parmar et al. (2004), Izumi-Taylor et al. (2010), and Bordrova & Leong (2005)
- The relationship between cultural values, children’s behavior, and peer acceptance, with research from Chen (2012), Rogoff (2003), Farver et al. (1995), Burridge (1957), and Boyette (2013)
- Harsh parenting and its influence on aggression and externalizing behaviors across cultures, with research from Gershoff et al. (2010) and Gershoff et al. (2010)
- Corporal punishment across cultures, data and discussion, with research from Runyan et al. (2010), Human Rights Watch (2014), Ripoll-Nunez & Rohner (2006), Heekes et al. (2020), Lansford & Dodge (2008), Xu et al. (2000), Parker & Horowitz (2015), Ellison & Bradshaw (2009), Renteln (2010), Gershoff et al. (2012), Berlin et al. (2009), Gershoff et al. (2010), and Straus (2010)
- Differential use of corporal punishment for BIPOC and children with disabilities in school, with research from the US Department of Education (2017)
- Cultural differences in children’s differing interpretations of and responses to disciplinary methods, with research from Scharf & Goldner (2018) and Olsen et al. (2002)
- Discussion of biased aspects of Baumrind’s parenting styles typology
- Children’s varied interpretations of parenting strategies as a function of cultural values, with research from Zhao (2002), Chao (1994), Chao (2001), Varela et al. (2004), Baumrind (1971), McLeod et al. (1994), Dornbusch et al. (1987), Steinberg et al. (1994), and Pinquart & Rubino (2018)
- Discussion of China’s one-child policy and the implications for only children, with research from Feng et al. (2016), Hesketh et al. (2005),

Yang et al. (1995), Falbo & Hooper (2015), Falbo (2012), and Falbo & Poston (1993)

- Discussion of age segregation versus mixed-age play across cultures, with research from Neyfakh (2014), Rogoff (2003), Gray (2011), Maynard (2002), Odden & Rochat (2004), and Reese (1998)

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### Physical and Cognitive Development in Middle Childhood

- Global statistics and data on dental health, with research from the World Health Organization (2017)
- US statistics and data on dental health, with information on racial and ethnic disparities and research from the Centers for Disease Control and Prevention (2021) and the US Department of Health and Human Services (2020)
- Cross-cultural data on habits and factors contributing to obesity/overweight in children, with research from Monzani et al. (2019), Shriver et al. (2018), Piernas & Popkin (2010), Park et al. (2010), Cairns et al. (2013), Andreyeva et al. (2011), and Bragg et al. (2020)
- Fast-food consumption, race/ethnicity and overweight/obesity, with research from Vikraman et al. (2015)
- The influence of race/ethnicity and poverty on compromised sleep, with research from El-Sheikh et al. (2010) and Beebe (2011)
- Physical activity trends across cultures and features of modern life contributing to its decline, with research from Fühner et al. (2021), Tomkinson & Olds (2007), Tremblay et al. (2016), Manyanga et al. (2018), Gwynn et al. (2010), and Shepherd et al. (2007)
- Cross-cultural research on recess in primary schools, with research from Grao-Cruces et al. (2020)
- Poverty and organized sports participation, with research from The Aspen Institute (2021) and Duke et al. (2003)
- The differential impact of COVID-19 on BIPOC children, with research from The Aspen Institute (2021), Dunton et al. (2020), Bates et al. (2020), Rundle et al. (2020), and Francisco et al. (2020)
- Obesity in low-, middle- and high-income countries, with research from the World Health Organization (2021)
- The influence of urban versus rural and immigration status on physical inactivity,

with research from Johnson & Johnson (2015), the Council on Sports Medicine and Council on School Health (2006), and Singh et al. (2013)

- Increased risk of developing multisystem inflammatory disorder after COVID-19 infection in BIPOC children, with research from Shekerdemian et al. (2020) and Yasuhara et al. (2021)
- Global asthma prevalence and racial/ethnic disparities, with research from the World Health Organization (2021), Ferrante & Grutta (2018), Akinbami (2006), and the Federal Interagency Forum on Child and Family Statistics (2021)
- Global diabetes prevalence and racial/ethnic disparities, with research from Patterson et al. (2019), the Centers for Disease Control and Prevention (2020), Farsani et al. (2013), and Dabalea et al. (2014)
- Global hypertension prevalence, with research from Song et al. (2019), Bucher et al. (2013), and Rosner et al. (2013)
- Cultural influences on Piagetian task performance, with research from Mishra (2001), Dasen (1975, 1994, 1984), Price-Williams et al. (1969), and Shayer et al. (2007)
- Experience in cultural contexts and mathematical abilities, with research from Guberman (1996), Resnick (1989), and Carraher et al. (1988)
- Information on the Kaufman Assessment Battery for Children; designed for children with various special needs and from diverse groups, with research from Singer et al. (2012)
- Cultural critique of IQ testing, with research from Lynn et al. (2007)
- Data and discussion on racial/ethnic differences in IQ, with research from Neisser et al. (1996), Dickens & Flynn (2006), Ang et al. (2010), Rindermann & Pichelmann (2015), Herstein & Murray (1994), Jensen (1969), Gray & Thompson (2004), Sternberg et al. (2005), Nisbett et al. (2012), and Colman (2016)
- Asian American student achievement and cultural values, with research from Nisbett et al. (2012)
- Varying conceptions of intelligent behavior across different cultures, with research from Grigorenko et al. (2001), Cocodia (2014), Rogoff (2003), Wober (1971), Ellis & Siegler (1997)
- Culture-free and culture-fair intelligence testing
- Tacit knowledge in indigenous cultures, with research from Grigorenko et al. (2004) and Sternberg (2004)

- Second-language learners in US school systems, with research from the Federal Interagency Forum on Child and Family Statistics (2021), the National Center for Education Statistics (2017), Padilla et al. (1991), Crawford (2007), and Krashen & McField (2005)
- English-immersion approaches and bilingual education
- Historical, regional, and gender differences in literacy rates across the globe, with research from the UNESCO Institute for Statistics (2017)
- Gender differences in school achievement, with research from Voyer & Voyer (2014), Halpern et al. (2007), Freeman (2004), Scheiber et al. (2015), Camarata & Woodcock (2006), Reilly et al. (2015), Lindberg et al. (2010), Else-Quest et al. (2010), and Nisbett et al. (2012)
- Indirect influences of socioeconomic status on academic achievement, with research from Kena et al. (2014), Johnston et al. (2015), Reardon (2011), and Paschall et al. (2018)
- The influence of growing up in poverty on brain development, with research from Hackman et al (2010), Blair & Raver (2016), and Hair et al. (2015)
- Racial/ethnic gaps in school achievement, with research from Lee & Reeves (2012), the National Center for Education Statistics (2007, 2021), and Hernandez & Macartney (2008)
- Class size across different countries and student populations, with research from the Organisation for Economic Co-Operation and Development (2013, 2021), Nandrup (2016), Zyngier (2014), and Watson et al. (2013)
- Variations in philosophy and implementation of charter schools
- Statistics on homeschooling, including outcomes, and racial, ethnic, and religious differences, with research from White et al. (2021), Betts & Tang (2016), Berends (2015), Clark et al. (2015), National Center for Education Statistics (2008), and Redford et al. (2016)
- The influence of COVID-19 on disadvantaged and BIPOC students, with research from the Legal Information Institute (2021), the National Institutes of Health (2021), Poletti & Raballo (2021), Dunn et al. (2020), Graves et al. (2021), UNICEF and the International Telecommunications Union (2020), Friedman et al. (2021), Allen et al. (2020), McKinsey & Company (2021), Fraiman et al. (2021), and Kahambing (2021)
- Differential access of BIPOC and poor children to educational technology, with research from Common Sense Media (2020)
- Differential access to educational technology, global data, with research from the Organisation for Economic Co-Development and Learning (2021)
- Causes, interventions, and outcomes for children with intellectual disabilities, with research from the American Psychiatric Association (2013), Zablotsky et al. (2015), Olusanya et al. (2020), and Woodruff et al. (2004)
- Gender differences in dyslexia, with research from Arnett et al. (2017)
- Racial/ethnic and gender differences in prevalence for ADHD, with research from the Centers for Disease Control and Prevention (2020) and Xu et al. (2018)
- Identifying and assessing gifted children, with research from McClain & Pfeiffer (2012) and the National Center for Education Statistics (2018)
- Educating gifted children, with research from Vogl & Preckel (2014)

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### Psychosocial Development in Middle Childhood

- Differences in the development of industry across cultures
- The transmission of cultural values in parental socialization efforts, with research from Friedlmeier et al. (2011)
- The influence of cultural values on emotional experience, with research from Hareli et al. (2015) and Cole et al. (2002)
- The expression of guilt, shame, and pride as a function of culture, with research from Furukawa et al. (2012), Cole et al. (2002), and Cole et al. (2006)
- “The Talk” and racial socialization in Black families, with research from Anderson et al. (2021) and Jones & Neblett (2016)
- Socialization of aggression via cultural messages about important values, with research from Mayer & Mayer (1970), Chagnon (1968), Kulick (1997), and Lancy (2015)
- Differential consequences of parenting style as a function of cultural values, with research from Pinquart (2016, 2017, 2017), Pinquart & Fischer (2021), Pinquart & Kauser (2018), Rudy & Grusec (2006), Kordi & Baharudin (2010), Soenens & Beyers (2012), Halgunseth et al. (2006), Domenech Rodriguez et al. (2009), Kazemi et al. (2010), Garcia & Garcia (2009), and Calafat et al. (2014)
- Discussion on bias in research on maternal employment

- Differential consequences of the COVID-19 pandemic on maternal employment, with data from the US Bureau of Labor Statistics (2021), Alon et al. (2021), and Zamarro & Prados (2021)
- Data and discussion on direct and indirect influences of poverty on child outcomes, with research from the Federal Interagency Forum on Child and Family Statistics (2020), Chadry & Wimer (2016), Morris et al. (2017), and Yoshikawa et al. (2012)
- The influence of COVID-19 on BIPOC and female-headed households, with research from Chen & Thompson (2021) and Parolin (2021)
- Demographic changes in family structure, global data, with research from the Organisation for Economic Co-Operation and Development (2021)
- Variations in family structure and their influence on child outcomes, with research from the Federal Interagency Forum on Child and Family Statistics (2020), Brown (2010), and Artis (2007)
- Divorce rates, global and US data and discussion, with research from Wang & Schofer (2018), the Organisation for Economic Co-Operation and Development (2021), Amato (2014), Cherling (2010), Centers for Disease Control and Prevention (2021), Jones (2015), and Clark & Brauner-Otto (2015)
- Divorce in foraging and agrarian cultures, with research from Lancy (2014), Howell (2017), Jones et al. (2017), Marlowe (2010), Enwereji (2008), Greaves & Kramer (2018), and Hurtado & Hill (1996)
- US statistics on single-parent families, including variations in race and ethnicity, with research from Kramer (2019) and Hemez & Washington (2021)
- Child outcomes in single-parent families, with research from Brown (2010), Duriancik & Goff (2019), Lerman et al. (2017), Heiland & Liu (2006), Craigie et al. (2012), Waldfogel et al. (2010), and Bjarnason et al. (2012)
- Global cohabitation rates across countries, with research from the Social Trends Institute (2011)
- Cohabiting and socioeconomic variables, with research from the US Census Bureau (2021), Manning (2017), Mather (2010), and Kroeger & Smock (2014)
- Cultural issues related to marriage norms and cohabitation, with research from Pelletier & Schnor (2017)
- Gay and lesbian parents, global and US data, with research from the Pew Research Center (2019), Gates (2015), and the US Census Bureau (2021)
- Gay and lesbian parents and child outcomes, with research from Golombok et al. (2013), Meezan & Rauch (2005), Pawelsi et al. (2006), Biblarz & Stacey (2010), Perrin et al. (2013), Fedewa et al. (2015), Manning et al. (2014), and Schumm & Crawford (2019)
- Racial/ethnic demographics of adopted children over time, data and discussion, with research from Brodzinsky & Pinderhughes (2002) and the US Department of Health and Human Services (2020)
- International and transracial adoption, with research from Vandivere et al. (2009), Budiman & Lopez (2017), Bosch et al. (2003), Palacios & Brodzinsky (2010), and Lee et al. (2006)
- Sibling care across cultures, with research from Cicirelli (1994), Hafford (2010), and Weisner (1993)
- Immigrant children and the reduction of prejudice, with research from Nesdale (2011), Tropp et al. (2014), Tezanos-Pinto et al. (2010), Cameron et al. (2006), van Zalk & Kerr (2014), Beelmann & Heinemann (2014), and Jones & Rutland (2018)
- Gender-typed styles of children's play, with research from Rose & Rudolf (2006), McHale et al. (2004), Rose & Smith (2018), Oberle et al. (2010), and Rose & Asher (2017)
- Gender segregation in play in indigenous and agrarian cultures, with research from Lew-Levy et al. (2018) and Messing (1957)
- Bullying, global data and discussion, with research from UNESCO (2019, 2017) and Richardson & Hiu (2018)
- Risk factors for victimization across cultures, with research from Hodges et al. (1999), Veenstra et al. (2005), Nansel et al. (2001), Schwartz et al. (2000), Boulton & Smith (1994), Olweus (1995), Berger (2007), Bacchini et al. (2015), Van Geel et al. (2014), Centers for Disease Control and Prevention (2021), and UNESCO (2019)
- Cross-cultural research on violent media and video game exposure and aggressive behavior, with research from Anderson et al. (2017), Anderson et al. (2010), Anderson et al. (2003), Gentile (2011), Huesmann (2007), Ferguson (2015), and Gentile (2017)
- Mental health consequences of the COVID-19 pandemic on children from different cultures, with research from Polanczyk et al. (2015), Van Lancker & Parolin (2020), Orgiles et al. (2020), Jiao et al. (2020), Rojas-Flores et al. (2017), and Putnam et al. (2013)

## Physical and Cognitive Development in Adolescence

- Adolescence as a social construction
- Puberty and LGBTQ+ identity development, with research from Lopez (2013), Hall et al. (2021), Hanckel et al. (2019), Munro et al. (2019), Newcombe & Mustanski (2010), Bouchey & Furman (2003), Harper et al. (2016), Ghosh (2020), Garg & Volerman (2021), and Robertson (2014)
- Gender differences in the adolescent growth spurt, with research from Susman & Rogol (2004) and Gans (1990)
- Secular trend for age at puberty, with research from Doe et al. (2019), Arthur et al. (2016), Lewis et al. (2016), and Papadimitriou (2016)
- Cross-cultural differences in age at puberty, with research from Anderson et al. (2003), Euling et al. (2008), Meng et al. (2017), Pathak et al. (2014), and Garenne (2020)
- Factors associated with earlier or later pubertal development across countries, with research from Soliman et al. (2014), Slyper (2006), and Tremblay et al. (2014)
- Factors associated with earlier or later pubertal development in boys and girls, with research from Anderson et al. (2003), Lee et al. (2007), Davison et al. (2003), Li et al. (2017), Shaitlin & Kiess (2017), Reinehr & Ross (2019), Busch et al. (2020), and Wang (2002)
- Life stressors and early puberty in girls, with research from Maisonet et al. (2010), Belsky et al. (2007), Ellis et al. (1999), Mendle et al. (2006), Tither & Ellis (2008), Belsky et al. (2015), Ellis & Del Giudice (2014), and Bleil et al. (2013)
- Variations in pubertal timing by race/ethnicity, with research from Biro et al. (2013), Biro & Wein (2010), Cabrera et al. (2014), Papadimitriou (2016), and Herman-Giddens et al. (2012)
- Cross-cultural tendency for teens' risk-taking, with research from Duelle et al. (2018)
- Trends in adolescent physical activity, global data, with research from the World Health Organization (2020), Guthold et al. (2020), Elgar et al. (2015), and Rossi et al. (2021)
- Data on and variations in physical activity in US teens by gender and age, with research from Guthold et al. (2020), Merlo et al. (2020), and Kann et al. (2018)
- Adolescent overweight and obesity prevalence, global data, with research from the World Health Organization (2021), UNICEF (2019), Bentham et al. (2017), and Murray & Ng (2017)

- Adolescent overweight and obesity prevalence, US data and racial/ethnic and socioeconomic differences, with research from the Centers for Disease Control and Prevention (2020), Ogden et al. (2018), and Delamater et al. (2013)
- Racial/ethnic and gender differences in body satisfaction and their influence on eating disorders, with research from Loth et al. (2015), Berge et al. (2015), Buccianeri et al. (2016), and Gillen & Lefkowitz (2012)
- Eating disorders in BIPOC, data and discussion, with research from Cheng et al. (2019), Beccia et al. (2019), Sonnevile & Lipson (2018), Becker et al. (2003), Uri et al. (2021), and Lee-Winn et al. (2014)
- Eating disorders in sexual minorities, with research from McClain & Peebles (2016), Meneguzzo et al. (2018), Simone et al. (2020), Diemer et al. (2015), and Nagata et al. (2020)
- Alcohol use, global and US data and correlates, with research from the World Health Organization (2019), Kuntsche et al. (2017), and Dir et al. (2017)
- Adolescent tobacco use, global and US data, with research from Eriksen et al. (2013) and Gabhainn & Francois (2000)
- Greater risk from smoking for African American teens, with research from Moolchan et al. (2006)
- Peer influences on smoking in collectivistic and individualistic cultures, with research from Liu et al. (2017)
- Global data on depression, with research from the World Health Organization (2020)
- Gender differences in adolescent depression, with research from Breslau et al. (2017), Birmaher et al. (1996), Hankin et al. (2007), Al Omari et al. (2020), Baird et al. (2020), and Tang et al. (2021)
- Adolescent death, global and US data, with research from the World Health Organization (2021) and Heron (2021)
- Seat belt usage and race/ethnicity, with research from Yellman et al. (2020)
- Adolescent suicide, global data, with research from the World Health Organization (2021)
- Race/ethnicity and suicide risk, with research from Curtin (2018)
- Suicide risk and sexual minorities, with research from Caputi et al. (2017), Toomey et al. (2018), and Herman et al. (2014)
- Firearm deaths in the United States and other countries, with research from Heron (2018), Cunningham et al. (2018), Blum & Qureshi (2011), and the AAP Committee on Injury and Poison Prevention (2000)

- Disparities in adolescent firearm deaths by race/ethnicity and gender, with research from Price & Khubchandani (2017) and the Centers for Disease Control and Prevention (2020)
- The influence of culturally relevant activities on formal reasoning skills, with research from Gardiner & Kozmitzki (2005), Hollos & Richards (1993), and Retschitzki (1989)
- Gender-based critique of Kohlberg's moral development theory, with research from Gilligan (1982, 1993) and Jaffee & Hyde (2000)
- The three ethics of moral development across cultures, with research from Schweder et al. (1997)
- Variations in developmental trajectories of the three ethics as a function of culture, with research from Jensen (2011)
- Religious influences on moral development, with research from Jensen (1998, 2011), Fahmy (2018), and Scuipac et al. (2020)
- Cultural differences in the socialization of morality in girls, with research from Flannagan et al. (1998)
- Prosocial behavior and well-being, cross-cultural data, with research from Aknin et al. (2013) and Chan et al. (2014)
- Graduation rates across Organisation for Economic Co-operation and Development (OECD) countries, with research from OECD (2008) and the National Center for Education Statistics (2019)
- Motivations for academic achievement in different countries, with research from Larson & Wilson (2004)
- Social and economic barriers to education in developing countries
- Cross-cultural variations in math and reading scores for girls and boys, with research from OECD (2019)
- Brain differences in boys and girls and their interaction with academic achievement, with research from Halpern et al. (2007), Ingahalikar et al. (2014), Ruigrok et al. (2014), and Luders et al. (2014)
- Trends in gender disparities in higher educational degrees awarded to men and women, with research from Hyde & Mertz (2009) and Okahana & Zhou (2017)
- Race/ethnicity and high school graduation rates, data and discussion, with research from Garcia-Coll et al. (1996), Irwin et al. (2021), and Benner & Graham (2009)
- High school achievement across countries and between boys and girls, with research from Psacharopoulos & Patrinos (2018), the World Bank (2018), and van Lancker & Parolin (2020)

- US high school drop-out rates and race/ethnicity, with research from Irwin et al. (2021)
- Gender, discrimination, and career choice, with research from Chervan et al. (2017), Eccles (2004), the Organisation for Economic Co-Operation and Development (2021), Funk & Parker (2018), and Wang et al. (2013)
- Non-college-bound students, with research from Bozick & DeLuca (2011) and the National Research Council (1993)

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### Psychosocial Development in Adolescence

- Religious identity formation, with research from Lippman & MacIntosh (2010)
- Gender differences in identity processes over time and across cultures, with research from Fischer (1981), Hodgson & Fischer (1979), Kroger (2003), Årseth et al. (2009), Beyers & Seiffge-Krenke (2010), and Kerpelmen et al. (2012)
- Identity development in and outcomes of sexual minority youth, with research from Bregman et al. (2013), Ryan et al. (2010), Baiocco et al. (2016), and Rosario et al. (2011)
- Transgender identity development processes, with research from Flores et al. (2017), Meerwijk & Sevelius (2017), Boskey (2014), Diamond et al. (2011), and Grossman et al. (2005)
- Contextual factors in and outcomes of racial and ethnic identity formation, with research from Phinney (1998), Yip et al. (2006), Phinney & Ong (2007), French et al. (2006), Syed & Juan (2012), Portes et al. (2000), Umana-Taylor et al. (2009), Smith & Silvia (2011), and Rivas-Drake et al. (2014)
- Influence of perceived discrimination on racial and ethnic identity formation, with research on Benner & Kim (2009), Greene et al. (2006), Myrick & Martorell (2011), and Brody et al. (2006)
- Cultural socialization practices, definition and discussion of influence on ethnic identity formation, with research from Juang & Syed (2010), Hughes et al. (2006), and Else-Quest & Morse (2015)
- Individualism-collectivism, the stability of the self, and self-construal, with research from Markus & Kitayama (1991), Dhawan et al. (1995), Rhee et al. (1995), Trafimow et al. (1991), Dabul et al. (1995), and Ma and Schoeneman (1997)

- LGBTQ+ prevalence, including racial and ethnic US data, with research from the Guttmacher (2019), Glick et al. (2015), Brown (2017), and Kann et al. (2018)
- Biological correlates of sexual orientation, with research from Blanchard (2017), Bogaert (2006), VanderLaan et al. (2015), Skorska et al. (2017), Grimbos et al. (2010), Bao & Swaab (2010), Savic & Lindstrom (2008), Savic et al. (2005), Berglund et al. (2006), Safron et al. (2017), and Safron et al. (2018)
- LGBTQ+ risks for negative outcomes, with research from Kann et al. (2018), Mongelli et al. (2019), and Morgan et al. (1993)
- Transgender risks for negative outcomes, with research from Goldblum et al. (2012), Johns et al. (2019), Borgogna et al. (2018), Grossman et al. (2011), Grossman & D'Augelli (2007), and Grossman et al. (2005)
- Variations in sexual behavior across different cultures, with research from Liang et al. (2019)
- Gender and race/ethnicity differences in sexual behavior in US adolescents, with research from the Centers for Disease Control and Prevention (2020, 2017), Guttmacher Institute (2018), Habel et al. (2018), Remez (2000), Madigan et al. (2018), Patchin & Hinduja (2019), Houck et al. (2014), Burrus (2018), Meade & Icovic (2005), and Mori et al. (2019)
- Religiosity, peer group norms, and sexual behavior, with research from Haglund & Fehring (2010), Vasilenko & Espinosa-Hernandez (2019), Abma et al. (2010), and Landor et al. (2011)
- Contraceptive availability across countries, with research from Sully et al. (2020)
- Sexually transmitted infections, global data and causes, with research from the World Health Organization (2021) and Advocates for Youth (2010)
- Vaccines and HPV risk, global data, with research from Chibwesha & Stringer (2019)
- HPV, HIV, and other sexually transmitted infections, global and US data, with research from the Centers for Disease Control and Prevention (2022, 2021, 2020, 2014), UNAIDS (2021, 2013), the World Health Organization (2021), and Rowley et al. (2019)
- Teen pregnancy, sexual assault, abortion, and childbirth in developing and developed countries, with research from the World Health Organization (2020)
- Global variations in teen pregnancy and abortion rates, with research from the Guttmacher Institute (2013), Lindberg et al. (2016), and Sedgh et al. (2015)
- Teen pregnancy, US data and discussion, with research from Ventura et al. (2014), Hamilton et al. (2021), and Kost et al. (2017)
- Racial/ethnic and socioeconomical influences on teen pregnancy, with research from Hamilton et al. (2021), Nash & Dreweke (2019), Centers for Disease Control and Prevention (2019), Madigan et al. (2014), and Fasula et al. (2019)
- Sexual education and contraceptive access across different cultures, with research from Fonner et al. (2014) and Santelli et al. (2017)
- LGBTQ+ inclusivity in sexual education, with research from Santelli et al. (2017), Rabbitte (2020), SEICUS (2021), Keiser et al. (2019), and Proulx et al. (2019)
- Female genital mutilation, with research from the World Health Organization (2022)
- Child marriage, global data and discussion, with research from the United Nations Population Fund (2022)
- Variations in adolescent discretionary time use by culture, with research from Larson & Verma (1999), Verma & Larson (2003), Larson & Wilson (2004), Larson (2001), Rideout et al. (2010), Fredericks & Eccles (2010), and Sharp et al. (2015)
- Cultural differences in individuation processes, with research from Dwairy & Achoui (2010), Bornstein & Putnick (2018), Giordano et al. (1993), Hardway & Fuligni (2006), and Telzer & Fuligni (2009)
- Cultural findings on the link between family climate and adolescent disclosure, with research from Yau et al. (2009) and Yun et al. (2016)
- Outcomes of poverty and maternal unemployment, with research from Han et al. (2010), Bauer et al. (2012), Morrissey (2013), Kalil & Ziol-Guest (2005), Brand & Thomas (2014), and Sobelewski & Amato (2005)
- Single mothers and challenges of COVID-19, with research from Taylor et al. (2021) and Whittle et al. (2020)
- Sibling care across cultures, with research from Weisner et al. (1977) and Maynard (2004)
- Sexting across cultures, with research from Madigan et al. (2018)
- Internet use by LGBTQ adolescents, with research from Korchnaros et al. (2015)
- Cyberbullying, global data, with research from Brochado et al. (2017)

- Existence of romantic love across cultures, with research from Jankowiak & Fischer (1992)
- Intimate partner violence (IPV), global data, with research from Coll et al. (2020) and UNICEF (2021)
- The prevalence of IPV as a function of race/ethnicity and gender, with research from the Centers for Disease Control and Prevention (2021), Halpern et al. (2003), and Vagi et al. (2015),
- The prevalence of IPV as a function of sexual orientation or gender identity, with research from Edwards et al. (2015), Halpern et al. (2003), Reuter et al. (2017), and Black et al. (2011)
- Poverty and disadvantaged communities as a risk factor for antisocial behavior, with research from Piotrowska et al. (2015), Macmillan et al. (2004), Rekker et al. (2015), Odgers et al. (2015), Chung & Steinberg (2006), Stewart & Simons (2010), Slatterly & Meyers (2014), Criss et al. (2017), and Odgers et al. (2009)
- The influence of culture on antisocial tendencies in youth, with research from Murray et al. (2018)
- Treatment programs for behaviorally disturbed youth, with research from Piquero et al. (2016), Reynolds et al. (2011), Yoshikawa (1994), Loeber et al. (2003), Tolan et al. (2003), Petrosino et al. (2013), Petitclerc et al. (2013), and Dodge et al. (2006)

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## Physical and Cognitive Development in Emerging and Young Adulthood

- Historical changes in the patterns of adulthood, with research from Lundberg & Pollack (2014) and Daugherty & Copen (2016)
- Cultural differences in entry into adulthood, with research from Arnett (2014), Crockett et al. (2015), Zhong & Arnett (2014), and Buhl & Lanz (2007)
- Global data on causes of death, with research from Blum & Nelson-Mmari (2004)
- Racial/ethnic, regional, and socioeconomic differences in health in the United States, with research from Perreira et al. (2019), Braveman et al. (2010), and Caldwell et al. (2016)
- Rheumatoid arthritis, consequences of, and hidden disability, with research from Wasserman (2011), Valeras (2010), Josefsson & Gard (2010), Nikolaus et al. (2010), Lapsley et al. (2002), and Evans et al. (2013)

- Global data on preventable diseases, with research from the World Health Organization (2021) and Afshin et al. (2019)
- Global data on obesity and overweight in adults, with research from UNICED/WHO/World Bank Group (2019)
- Global data and information on food insecurity, with research from the World Health Organization (2021)
- US data and information on food insecurity, with research from Nagat et al. (2019) and Arenas et al. (2019)
- Stress levels across different races/ethnicities, with research from the American Psychological Association (2021)
- Gender differences in reported stress and coping strategies in college students, with research from Crăciun (2013), Nolen-Hoeksema & Aldao (2011), and Broughan et al. (2009)
- Global data and discussion on internet addiction, with research from Meeker (2018), Cash et al. (2012), Cheng & Li (2014), Kuss et al. (2014), Su et al. (2019), Blachnio et al. (2019), Seabra et al. (2017), Bozoglan et al. (2013), Chung et al. (2019), Laconi et al. (2018), and the United Nations (2018)
- Global data on smoking prevalence and health and economic consequences, with research from the World Health Organization (2021) and Goodchild et al. (2018)
- US data on smoking prevalence rates across racial/ethnic groups, with research from Centers for Disease Control and Prevention (2020, 2021)
- Effectiveness of smoking cessation campaigns across different cultures/countries, with research from the World Health Organization (2021)
- US data on prevalence rates for alcohol use across racial/ethnic groups and genders, with research from Wallace et al. (2005) and the National Institute on Alcohol Abuse and Alcoholism (2021)
- Socioeconomic status, education, and health, with research from Williams et al. (2016), National Center for Health Statistics (2020), Lago et al. (2018), SAMHSA (2020), Mohai et al. (2009), and Bellinger (2008)
- Disparities in health and health care access for BIPOC, with research from Zimmerman & Anderson (2019), Williams et al. (2016), Kirk et al. (2006), NCHS (2017), Williams (2012), Caraballo et al. (1998), Magesh et al. (2021), and Hooper et al. (2020)

- Influence of discrimination and systemic racism on health, with research from Williams et al. (2019), Smedley et al. (2003), Van Ryn et al. (2011), and White & Borrell (2011)
- Global data on the importance of relationship to health across countries, with research from Santini et al. (2015)
- Global data on alcoholism, with research from the World Health Organization (2018)
- Global data on depression, with research from Moreno-Agostino et al. (2021)
- Global and US data on gender differences in depression, with research from Salk et al. (2017), Salk et al. (2016), Gorman (2006), and Franconi et al. (2007)
- Global variations in sexual behavior and attitudes, with research from the Pew Research Center (2014, 2017) and Chamie (2018)
- Support for marriage equality and religious affiliation, with research from Daugherty & Copen (2016) and Pew Research Center (2019)
- US prevalence of homosexuality, bisexuality, and transgender status, with research from Copen et al. (2016), Flores et al. (2017), Meerwijk & Sevelius (2017), Pew Research Center (2013), and Grov et al. (2006)
- Global data on HIV status with research, from the World Health Organization (2021, 2019) and Marcus et al. (2020)
- Sexually transmitted infections across racial and ethnic groups in the United States, with research from the Centers for Disease Control and Prevention (2019)
- Campus diversity and cognitive and academic consequences, with research from Bowman (2010, 2013), Antonio et al. (2004), Bowman (2010), Fischer (2008), Gurin et al. (2003), and Zhang (2004)
- Shweder's three ethics of moral values across cultures, with research from Shweder et al. (1997), Guerra & Giner-Sorolla (2015), Haidt et al. (1993), Jensen (1998), and Jensen (2011)
- Historical access to college educations for women and BIPOC, with research from Harper et al. (2009) and Conway (1974)
- Postsecondary enrollment rates across countries, with research from the Buchman & DiPrete (2006), Sen et al. (2005), and McFarland et al. (2019)
- Gender differences in majors and postgraduation employment, with research from Funk & Parker (2018), Wang & Degol (2017), McFarland et al. (2019), Halpern

- et al. (2007), Miller et al. (2015), and Pew Research Center (2018)
- Socioeconomic status, race/ethnicity, and access to college, with research from Cahalan et al. (2018), Dey & Hurtada (1999), and Hamilton & Hamilton (2006)
- College graduation rates by race/ethnicity, with research from McFarland et al. (2019) and Montgomery & Cote (2003)
- Wage disparities as a function of degree obtained, with research from the McFarland et al. (2019) and Hamilton & Hamilton (2006)
- Cross-cultural data on economic self-sufficiency, with research from Bell et al. (2007)
- Gender gap in earning, with research from the National Center for Education Statistics (2019) and the US Bureau of Labor Statistics (2021)

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### Psychosocial Development in Emerging and Young Adulthood

- Paths to adulthood characterizing common US trajectories, with research from Arnett (2014), Scales et al. (2016), Oesterle et al. (2010), Oesterle et al. (2011), Boden et al. (2008), Dariotis et al. (2011), Assini-Meytin & Green (2015), Driscoll (2014), Gomez-Scott & Cooney (2014), Mitchell & Syed (2015), Eliason et al. (2015), and Schulenberg et al. (2005)
- Identity processes and cultural context, with research from Berman et al. (2011), Cheng & Berman (2012), and Schlegel (2013)
- Ethnic identity development in minority adults, with research from Phinney (2003), Tajfel (1981), and Phinney (2006)
- Benefits of an achieved and positive ethnic identity, with research from Rivas-Drake et al. (2014), Rivas-Drake et al. (2014), Smith & Silva (2011), Yip (2014), Phinney (1989), Phinney et al. (1997), Phinney et al. (2007), and Schwartz et al. (2013)
- Global data and discussion of religious identity formation, with research from Pew Research Center (2018), Koenig et al. (2008), Benson et al. (2012), Smith et al. (2010), and Smith & Snell (2009)
- Data and discussion on sexual and gender identity formation, with research from Savin-Williams (2011) and Morgan (2013)
- Cultural influences on sexual identity formation, with research from Floyd & Bakeman (2006), Halpern & Kaestle (2014), and Eliason (1995)

- Transgender identity development, with research from Diamond et al. (2011), Katz-Wise et al. (2017), Connolly et al. (2016), Bockting (2014), Connolly et al. (2016), Katz-Wise et al. (2017), and Riggle et al. (2011)
- Barriers to intimacy for people with disabilities, with research from English et al. (2018)
- Gender differences in identity status achievement, with research from Kahn et al. (2014) and Boden et al. (2010)
- Cultural and historical differences in the timing of the social clock, with research from Arnett (2010) and Martin et al. (2021)
- Racial and ethnic differences in the receipt of assistance from parents, with research from Country Services Financial Security Index (2018)
- Cultural differences in the establishment of a separate household for young adults, with research from Arnett (2015), Lennartz et al. (2016), Victor (2015), Seiffge-Krenke (2016), and Jackson et al. (2020)
- Gender differences in friendships, with research from Hall (2011), Rosenbluth & Steil (1995), Helms et al. (2003), and Bowman (2009)
- Fictive kin relationships in single, unmarried, gay or lesbian, or unconventional adults, with research from Muraco (2006), Casper et al. (2016), and Demir et al. (2018)
- Interracial dating, with research from Livingston & Brown (2017), Gillmer (2017), Johnson & Kredier (2013), Ranzini & Rosenbaum (2020), and Brym & Lenton (2020)
- Evidence of romantic love across cultures, with research from Jankowiak & Fischer (1992)
- Global data on single adulthood, with research from Geist (2017) and UN Women (2019)
- Global data on the legalization of and support for same-sex marriage, with research from Saez (2011), Human Rights Campaign (2022), Poushter & Kent (2020), Council on Foreign Relations (2017), and Flores (2019)
- US data on the legalization of and support for same-sex marriage, with research from Cooperman et al. (2016), Neidorf & Morin (2011), McCarthy (2021), the Pew Research Center (2019), Riggle et al. (2010), and Walker & Taylor (2021)
- Relationship dynamics and quality of same-sex relationship, with research from Farr et al. (2010), Kurdek (2005, 2006), Roiman et al. (2008), Balsam et al. (2017), and Pope et al. (2010)
- Global cohabitation prevalence rates and information, with research from Lopez-Gay et al. (2014), Organisation for Economic Co-operation and Development (2016), United Nations (2011), Lesthaeghe (2010), Raymo et al. (2015), Treas et al. (2014), Yu & Xie (2015), Dominguez-Folgueras & Castro-Martin (2013), and Le Bourdais & Lapierre-Adamcyk (2004)
- Differences in cohabitation rates across racial and ethnic American emerging adults, with research from Manning (2013), Gurrentz (2018), and Horowitz et al. (2019)
- Global data on country income level and marriage rates, with data from Anukriti & Dasgupta (2017)
- Bride price and dowry transactions, with research from Conteh (2016), Dean (2018), Corno & Voena (2016), and Diamond & Smith et al. (2008)
- Arranged marriage, with research from Anukriti & Dasgupta (2017), Regan et al. (2012), Myers et al. (2005), Buunk et al. (2010), Bejayan et al. (2015), Levine et al. (1995), Allendorf & Ghimire (2013), and Naito & Geilen (2005)
- Gender differences in marriage attitudes in American adults, with research from Parker & Stepler (2017), Wang & Parker (2014), Murray-Close & Heggeness (2018), and Cohn & Fry (2010)
- Age at first marriage across different countries, with research from UNICEF (2021), Geist (2017), and Corselli-Nordblad & Gereoffy (2015)
- Age at first marriage in American adults across time, gender, and ethnicity, with research from Cohn et al. (2011), Wang & Parker (2014), Horowitz et al. (2019), Cohen (2016), and Kiersz (2017)
- Gender equity and marriage (Geist 2017)
- Wedding traditions across the world, with research from Smithsonian (2014), Monger (2013), Lacey (1969), Chesser (1980), Bingyao (2017), and Dundes (1996)
- Gender differences in underlying factors for marriage satisfaction, with research from Lavee & Ben-Ari (2004), Sullivan et al. (2010), and (Wilcox & Nock (2006)
- Cross-cultural differences in attitudes about extramarital sex, with research from Poushter (2014)
- Global data on parenthood, with research from Roser (2017) and the Organisation for Economic Co-operation and Development (2021)
- Ethnic and cultural differences in age at first birth, with research from Martin et al. (2018)
- US LGBTQ+ parenthood prevalence rates, with research from Gates (2015) and the US Census Bureau (2019)
- The gender gap and employment, with research from Murray-Close & Heggeness (2018)

- Individualism/collectivism, parenthood, and well-being across cultures, with research from Haar et al. (2014) and Glass et al. (2016)
- Historical changes in the labor force participation rates for mothers with children, with research from the US Bureau of Labor Statistics (2021), Bianchi et al. (2006), and Livingston (2018)
- Gender differences in time spent with children, with research from Livingston & Parker (2019), Parker & Wang (2013), Yeung et al. (2001); and across different countries, with research from Craig & Mullan (2011), García-Mainar et al. (2011), and Oshio et al. (2013)
- Cultural differences in the decline in marriage satisfaction following parenthood, with research from Onyishi et al. (2012)
- Gender differences in divorce risk, with research from Killewald (2016), Ruppanner et al. (2018), Sayer et al. (2011), Amato (2010), and Martin & Parashar (2006)
- Racial and ethnic differences in divorce risk, with research from Raley et al. (2020) and Bratter and King (2008)
- Sexual-minority status and divorce risk, with research from Bennett (2017) and Raley et al. (2020)

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## Physical and Cognitive Development in Middle Adulthood

- Midlife as a social construct, with research from Cohen (2012) and Lachman (2004)
- Midlife in traditional and indigenous cultures, with research from Menon (2001)
- Global data on visual impairment, with research from Fricke et al. (2018) and Berdahl et al. (2020)
- Racial/ethnic and gender differences in hearing loss, with Ozmeral et al. (2016) and Goman & Lin (2016)
- Racial/ethnic and gender differences in loss of taste and smell, with research from Liu et al. (2016) and Ajmani et al. (2017)
- Average age at menopause across different countries, with research from Monteleone et al. (2018)
- Racial and socioeconomic variations in hot flashes in menopausal women, with research from Col et al. (2009) and Avis et al. (2015)
- Cultural and racial/ethnic differences in the beliefs about and experience of menopause, with research from Scheid (2007), Jones et al. (2012), Minkin et al. (2015), Lock (1993), Mueck

- & Ruan (2017), Islam et al. (2017), and Tepper et al. (2016)
- Incidence of erectile dysfunction across countries, with research from McCabe et al. (2016)
- Global data on hypertension, with research from the World Health Organization (2021)
- US data on racial and ethnic differences in hypertension, with research from Fryar et al. (2017)
- Global data on heart disease, with research from the World Health Organization (2021)
- US data on racial/ethnic and gender differences in heart disease prevalence and presentation, with research from National Center for Health Statistics (2021), Khamis et al. (2016), and Patel et al. (2004)
- Global data on diabetes, with research from the World Health Organization (2021)
- US data on racial/ethnic and socioeconomic differences in diabetes, with research from the Centers for Disease Control and Prevention (2020)
- US data on the interaction of race/ethnicity and obesity risk, with research from Hales et al. (2020)
- Racial/ethnic and educational differences in adherence to recommended dietary guidelines, with research from Rehm et al. (2016)
- Discussion of the relationship between socioeconomic status, stress, and health, with research from National Center for Health Statistics (2018), Algren et al. (2018), Mooney et al. (2016), Lachman & Firth (2004), Marmot & Fuhrer (2004), and Wright et al. (2009)
- Genetic influences on health across racial groups, with research from Hinds et al. (2005) and Antonarakis & Cooper (2019)
- Correlates of ethnicity and their influence on health, with research from Smedley & Smedley (2005), Mode et al. (2016), and Rodriguez et al. (2019)
- The influence of race/ethnicity on health, with research from National Center for Health Statistics (2016, 2018), Smedley & Smedley (2005), Martorell & Martorell (2006), Berchick et al. (2018), Colen et al. (2018), and Williams et al. (2016)
- Gender differences in health, with research from Murphy et al. (2021), the World Health Organization (2019), Warraich & Califf (2019), Goldin & Lleras-Muney (2019), Hara et al. (2015), Mahalik et al. (2013), Courtenay (2011),

National Center for Health Statistics (2018), Cleary et al. (2004), Addis & Mahalik (2003), Seidler et al. (2016), Siegel et al. (2015), and Maranon & Reckelhoff (2013)

- Prevalence of osteoporosis across different countries, with research from Salari et al. (2021)
- Global data on breast cancer, with research from the World Health Organization (2021) and Porter (2008)
- Discrimination and stress, with research from the American Psychological Association (2021)
- Differential impact of COVID-19 on patterns of retirement across age, race, and socioeconomic status, with research from Baily et al. (2020), Gould (2021), Davis (2021), and Davis & Radpour (2021)
- Financial stress at midlife in economically disadvantaged adults, with research from Lusardi et al. (2011), Mani et al. (2013), Mullainathan & Shafir (2014), Petitta et al. (2020), Wickens (1996), Jiang & Lavayesse (2018), McKee-Ryan & Harvey (2011), Richardson et al. (2013), Sinclair et al. (2020), and Sinclair et al. (2021)
- Intergenerational transmission of financial stress, with research from Chetty et al. (2016), Chetty et al. (2018), Bond & Galinsky (2011), and Leana et al. (2012)
- Global data on literacy rates, with research from UNESCO (2017) and Rampay et al. (2016)

- Cultural influences on the social clock, with research from Pekel-Uladagh & Akbas (2016) and Johnson et al. (2017)
- Interaction of gender and cultural differences in the social clock, with research from Koropeckyj-Cox et al. (2007), Pekel-Uladagh & Akbas (2019), Billari et al. (2010), Leridon (2008), Barret & Toothman (2017), and Zoutewell-Terovan & Liefbroer (2018)
- Cultural differences in developmental trends in well-being, with research from Blanchflower (2021) and Graham & Pozuelo (2017)
- Cross-cultural research on experiencing a midlife crisis, with research from Chang (2018) and Kwon & Oh (2021)
- Body image, stigma, and well-being at midlife, with research from Schafer & Ferraro (2011), Hunger et al. (2015), Andreyeva et al. (2008), Tylka et al. (2014), Crandall (1994), Bacon & Aphramor (2011), and Bacon et al. (2005)
- The interaction between cultural ideals and self-esteem, with research from Westerhof et al. (2003) and Westerhof & Barrett (2005)
- Generativity and identity processes in women, with research from Allen & Finklestein (2014), Vandewater et al. (1997), DeHaan & MacDermid (1994), Peterson & Stewart (1996), Peterson & Duncan (2007), Peterson (2002), and Zucker et al. (2002)
- Income across and within countries and its relationship to well-being, with research from Cheung & Lucas (2015) and Ng & Diner (2018)
- Well-being in BIPOC and immigrants, with research from Ryff et al. (2004), Horton & Schweder (2004), Yamaguchi et al. (2016), and Ferrari et al. (2015)
- The influence of religiosity on well-being across different cultures, with research from Green & Elliot (2010), Hayward & Elliot (2014), Lipka & McClendon (2017), Zuckerman (2009), Weber et al. (2012), Galen & Kloet (2011), Van Cappellan et al. (2016), and Caldwell-Harris et al. (2011)
- Influence of culture and gender on social network size, with research from Wrzus et al. (2013) and Schwartz & Litwon (2018)
- Global data on same-sex marriage, with research from the Pew Research Center (2019), Lipka & Masci (2019), Keleher & Smith (2012), and Hicks & Lee (2006)
- Internalization of negative stereotypes and relationship quality in gay and lesbian adults, with research from Perales & Baxter (2018),

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### Psychosocial Development in Middle Adulthood

- Cultural differences in generativity across countries, with research from Hofer et al. (2008), Au et al. (2019), and de Espanes et al. (2015)
- Differences in generativity for religious and nonaffiliated adults, with research from Emmons & Paloutzian, (2003) and Dillon et al. (2003)
- Differences in generativity across race/ethnicity, with research from Hart et al. (2001)
- The Big 5 across cultures, with research from McCrae & Costa (1997), McCrae & Terracciano (2005), Chopik & Kitayama (2018), and Schmitt et al. (2008)
- Personality structure in hunter/gather groups, with research from Gurven et al. (2013)
- Racial/ethnic, socioeconomic, and gender influences on the subjective sense of aging, with research from Toothman & Barrett (2011) and Barrett & Toothman (2017)

- Cao et al. (2017), Frost & Meyer (2009), Feinstein et al. (2012), and Reczek (2020)
- The influence of marriage on health in gay and lesbian partners, with research from Liu et al. (2021), Wight et al. (2013), Chen & van Ours (2018), Ponce et al. (2010), Carpenter et al. (2018), and Downing and Cha (2020)
  - Relationship stability in gay and lesbian couples, with research from Rosenfeld (2014)
  - Arranged marriage, with research from Rubio (2013), Allendorf & Pandian (2016), Regan et al. (2012), Myers et al. (2005), and Arif & Fatima (2015)
  - The influence of marriage on health across different countries, with research from Tatangelo et al. (2017), Umberson et al. (2013), Kaplan & Kronick (2006), Wang et al. (2020), Robles et al. (2014), Chung & Kim (2014), Robarbs et al. (2012), and Rendall et al. (2011)
  - Global data and information on cohabitation, with research from the Organisation for Economic Co-operation and Development (2016), Odimegwu et al. (2018), Pereira (2005), Amato (2014), and Perelli-Harris et al. (2017)
  - Global data on divorce, with research from Wang & Schofer (2018) and the World Population Review (2021)
  - The influence of socioeconomic status on divorce risk, with research from Kaplan & Herbst (2015), Jalovaara (2003), Esping-Anderson (2016), Coulter & Thomas (2019), Dew (2011), Archuleta et al. (2011), Dew et al. (2012), Wilmoth & Koso (2002), and Lin et al. (2017)
  - Divorce in indigenous cultures, with research from Bird-David (1987), Kira & Hewlett (2018), Marlowe (2004), and Jones et al. (2017)
  - Parenting across cultures, with research from Chang & Greenberger (2012), Cohen & Bocos (2016), and Delveccio et al. (2016)
  - Racial/ethnic differences in leaving the nest, with research from Fingerman et al. (2011)
  - Cultural differences in norms regarding leaving the nest, with research from Buhl & Lance (2007), Rosenberger (2007), Fierro & Moreno (2007), He et al. (2020), Bouchard (2014), Zhang et al. (2020), and Goldsneider & Goldscheider (1999)
  - Cultural influences on the effect of childlessness on health, with research from Huijts et al. (2013), Zhang & Hayward (2001), Kendig et al. (2007), and Wenger et al. (2007)
  - Global research and discussion on the sandwich generation, with research from

- Parker & Patten (2013), Parker (2012), Alburez-Gutierrez et al. (2021), National Institutes of Health (2007), Ren & Treiman (2014), and the American Psychological Association (2007)
- Ethnic and cultural variations in caregiving, with research from Cohen et al. (2019), Ellison & Xu (2016), Dilworth-Anderson et al. (2002), Mitchell (2014), and Miyawaki (2016)
  - Cultural and ethnic differences in grandparenthood, with research from Kinsella & Velkoff (2001), Ban et al. (2017), Piperno (2012), Uhlenberg & Cheuk (2010), Glaser et al. (2013), Iacovou & Skew (2011), Del Boca (2015), Compton & Pollak (2014), Blieszner & Roberto (2006), Doblin-McNah & Hayslip (2014), and Dunifon et al. (2014)

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## Physical and Cognitive Development in Late Adulthood

- Cultural differences in the conceptions of old age, with research from Levy (2003)
- Global data on aging, with research from the United Nations (2019), the World Health Organization (2018), and He et al. (2016)
- US data on racial/ethnic diversity in aging populations, with research from the Administration for Community Living (2021)
- Global data on elder care, with research from HelpAge International (2015)
- Global data on life expectancy, with research from Islam et al. (2021), He et al. (2016), Kontis et al. (2017), Carmel (2019), the World Health Organization (2018, 2016), and the United Nations (2020)
- Gender differences in life expectancy, with research from the National Center for Health Statistics (2021)
- Racial/ethnic differences in mortality risk, with research from Yaya et al. (2020), Razai et al. (2021), Carter et al. (2019), Williams et al. (2019), and the National Center for Health Statistics (2021)
- Socioeconomic status and mortality risk, with research from Chetty et al. (2016)
- Global data on longevity, with research from the World Health Organization (2019)
- Socioeconomic influences on longevity, with research from Cho et al. (2015) and Fuller-Iglesias et al. (2015)

- Global data on visual impairment, including cataracts, macular degeneration, and glaucoma, with research from the World Health Organization (2021), Lee & Afshari (2017), Pascolini & Mariotti (2012), Mitchell et al. (2018), and Tham et al. (2014)
- Global data on hearing loss, with research from the World Health Organization (2021)
- Influence of hearing loss on well-being, with research from Ciorba et al. (2012), Davis et al. (2016), Gopinath et al. (2012), McArdle et al. (2005), and the National Institute on Deafness and Other Communication Disorders (2021)
- Global data on COVID-19 deaths, with research from Worldometer (2020), Centers for Disease Control and Prevention (2022), and Adam (2022)
- Global data on common chronic conditions, with research from Ritchie & Roser (2022)
- Racial/ethnic variations in chronic conditions, with research from the Federal Interagency Forum on Aging-Related Statistics (2020)
- Disabilities and functional limitations, with research from the Federal Interagency Forum on Aging-Related Statistics (2020) and Aitken et al. (2010)
- Global data on periodontal disease, with research from Nazir et al. (2020)
- Global data on mental and neurological disorders, with research from the World Health Organization (2018)
- Global data on depression, with research from the World Health Organization (2021)
- Socioeconomic status and depression, with research from the World Health Organization (2021)
- Global data on dementia, with research from the World Health Organization (2021) and Patterson (2018)
- Racial/ethnic variations in dementia risk, with research from Alzheimer's Association (2019)
- Well-being in sexual minorities, with research from Van Wagenen et al. (2013), Rice et al. (2019), Frederick-Goldsen et al. (2011), and Abatiell & Adams (2011)
- Religiosity, culture, and well-being, with research from Pew Research Center (2018, 2015), Marshall (2019), Koenig (2012), Seybold & Hill (2001), Bjørkløf et al., 2013, Green & Elliot (2010), Taylor et al. (2017), Chatters et al. (2015), and Ai et al. (2013)
- Religiosity, race/ethnicity, and well-being, with research from Tabak & Mickelson (2009), Hill et al. (2005), Park et al. (2018), Krause (2004), Ellison et al. (2017), and Ellison et al. (2008)
- Global aging stereotypes, with research from Quine et al. (2007), Ng et al. (2015), Vauclair et al. (2017), Ackerman & Chopnik (2021), North & Fiske (2015), and Scheve & and Venzon (2017)
- Gender differences in forgetting, with research from Peterson et al. (2010)
- Discrimination, egalitarianism, and ageism in the workplace, with research from Martin & North (2021)
- The US Age Discrimination in Employment Act, with research from Landy (1994), Neumark (2008), and Chou & Choi (2011)
- Global data on retirement trends, with research from the Organisation for Economic Co-operation and Development (2019) and Axelrad (2018)
- Retirement trends, race/ethnicity, and age, with research from Fry (2020), Morrisey (2020), and the US Bureau of Labor Statistics (2020)
- Financial concerns at retirement and poverty, with research from the Social Security Administration (2021), the Federal Interagency Forum on Aging-Related Statistics (2020), Larrimore et al. (2018), Administration on Aging (2020), Semega et al. (2017), and Sawicki (2005)
- Living arrangements across cultures, with research from Kinsella & Phillips (2005)
- Racial/ethnic variations in living arrangements, with research from the Federal Interagency Forum on Aging-Related Statistics (2020)
- Global data on aging in place, with research from Aurand et al. (2014)
- Technology and aging in place for the elderly, with research from Rogers et al. (2001), Wang et al. (2019), Lee (2014), Getson & Nejat (2021), Mois & Beer (2020), Cameron (2018), Faber &

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### Psychosocial Development in Late Adulthood

- Cross-cultural data on personality change in late adulthood, with research from Costa et al. (2019)
- Cross-cultural variations in developmental patterns of well-being, with research from Barger et al. (2009), Steptoe et al. (2015), and Oishi & Kesebir (2015)

- van Lierop (2020), Charness et al. (2018), and Yu et al. (2019)
- Cross-cultural and historical data on living with adult children, with research from the World Health Organization (2021), Bongaarts & Zimmer (2002), Hank (2007), and Kinsella & Phillips (2005)
- Global data on institutionalization of the elderly, with research from the World Health Organization (2019), Kinsell & Velkoff (2001), and Martikainen et al. (2009)
- Global data on elder abuse, with research from Yon et al. (2017), Pillemer et al. (2015), and Krug et al. (2002)
- Global data on the developmental course of loneliness, with research from Mund et al. (2019) and Luhmann & Hawley (2016)
- Burden of intergenerational care and women, with research from Gonyea (2013) and Cook & Cohen (2018)
- Cultural differences in intergenerational care, with research from Kalmijn & Saraceno (2008), Tomassini et al. (2007), Johnson (1995), United Nations (2019), and Costanzo & Hoy (2007)
- Racial/ethnic differences in intergenerational care, with research from Cohn & Passel (2018) and Dunifon et al. (2014)
- Gender differences in widowhood, with research from Andrew et al. (2018), the Federal Interagency Forum on Aging-Related Statistics (2020), Nihtila & Martikainen (2008), and Shor et al. (2012)
- Gender gap in divorce and remarriage, with research from Livingston (2014), Bulcroft & Bulcroft (1991), and Tucker et al. (1993)
- Global data on single life in old age, with research from Kinsella & Phillips (2005)
- LGBTQ+ relationships in old age, with research from Fredriksen-Goldsen & Muraco (2010), Reid (1995), Friend (1991), Kim & Fredriksen-Golden (2016), Goldsen et al. (2017), Orel (2004), Knochel et al. (2011), Rawlings (2012), and Addis et al. (2009)
- Global data on living apart together, with research from Liefbroer et al. (2015)
- Cohabitation and income level, with research from Vespa (2012), Brown et al. (2012), and Vespa (2013)
- Global trends in family size and living with adult children, with research from Dobriansky et al. (2007), Kinsella & Phillips (2005), Hank (2007), Deindl & Brandt (2017),

Verdery et al. (2019), Stanca (2016), and Tanaka & Johnson (2016)

- Immigrants and living with adult children, with research from Glick & Van Hook (2002)
- Global data on sibling relationships, with research from Viana et al. (2013)

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## Dealing with Death and Bereavement

- Commonalities in the response to death across cultures, with research from Parkes et al. (2015), Bechert & Quandt (2013), and Lobar et al. (2006)
- Cultural variations in funeral customs, with research from Ausubel (1964), Rahman (2011), Holloway (2014), Kerala (2005), The Week (2012), and Benadetti (2017)
- Cultural changes in attitudes toward death and dying, with research from McCue (1995)
- Global data on the terminal drop, with research from Johansson et al. (2004), Singer et al. (2003), Rabbitt et al. (2002), and Small et al. (2003)
- Rates of cognitive decline and education, with research from Bendavan et al. (2017)
- Near-death experiences across cultures, with research from Tassel-Matamua (2013)
- Terror management theory and cultural worldviews, with research from Juhl & Routledge (2016) and Burke et al. (2010)
- Cultural variations in the conception of death, with research from Vlok & de Witt (2012) and Bang (2015)
- Racial/ethnic differences in the number of children who experienced the COVID-19-related death of a caregiver, with research from Hillis et al. (2021)
- Cross-cultural differences in children's understanding of death, with research from Barrett & Behne (2005), Harris (2011), Astuti & Harris (2008), Gimenez & Harris (2005), and Hopkins (2014)
- Mortality risk and widowhood, with research from Shor et al. (2012) and Liu et al. (2020)
- Global data on gender differences in outcomes of becoming widowed, with research from Streeter (2020) and Lloyd-Sherlock et al. (2015)
- Gender differences in the response to widowhood, with research from Isherwood

- et al. (2017), Kinsella & Velkoff (2001), and Kang & Ahn (2014)
  - Global statistics on suicide, with research from the World Health Organization (2021)
  - Gender differences in suicide risk, with research from Curtin et al. (2016), the World Health Organization (2021), and Nock et al. (2008)
  - Racial/ethnic differences in suicide risk, with research from Xu et al. (2021)
- International and cultural variations in end-of-life options and decisions, with research from Steck et al. (2013), Bosshard et al. (2005), van der Heide et al. (2003), Bilsen et al. (2007), Pomfret et al. (2018), Bulmer et al. (2017), Stack & Kposawa (2011), Verbakel & Jaspers (2010), and Emanuel et al. (2016)
  - End-of-life decisions and diversity concerns, with research from Pew Research Center (2013), APA Working Group on Assisted Suicide (2005), and Lipka (2014)

# EXPERIENCE THE Human Side

*Experience Human Development* helps students experience the human side of development by exposing them to culture and diversity, immersing them in practical application, and helping them study smarter through personalized learning and reporting. *Experience Human Development* takes a practical approach to research and recognizes that just as people develop in their own way, your students also learn in their own ways.

## Diversity, Equity, and Inclusion

In response to requests from faculty like you, substantial space has been devoted to addressing issues of diversity, equity, and inclusion. When relevant, each chapter includes current US statistics drawn from census data and national governmental databases, including not just major population trends but also demographic and statistical information on ethnic and racial groups. In many cases, information on global statistics, trends, and cultural differences has been included as well.

Additionally, each chapter includes a Research in Action and a Window on the World feature. In the Research in Action features, a diverse group of young psychology scholars have been commissioned to discuss research on topics influenced by race, ethnicity, gender, sexual orientation, age, religion, disability, socioeconomic status, political orientation, and so forth. (For a complete list of scholars and topics, see pages lv-lix.) In the Window on the World features, a cross-cultural issue of interest is addressed from a global perspective. These research-based features address a wide variety of topics, including, for example, factors affecting access to education during the COVID-19 pandemic and cultural differences in beliefs about conception and fertility.

Other forms of diversity have also been included. For example, the influence of socioeconomic status is highlighted for topics such as low birth weight, health outcomes, tested IQ, and family relationships. Information is also included on people with disabilities and on different family structures, including LGBTQ+ parents, stepparents, divorced parents, and families in which adults remain single by choice.

A complete list of diversity, equity, and inclusion topics can be found on pages xxvii-xlix.

# of Development

Paired with McGraw Hill Education **Connect**, a digital assignment and assessment platform that strengthens the link between faculty, students, and course work, instructors and students accomplish more in less time. Connect Psychology includes assignable and assessable videos, quizzes, exercises, and interactivities, all associated with learning objectives. Interactive assignments and videos allow students to experience and apply their understanding of psychology to the world with fun and stimulating activities.



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## A PERSONALIZED EXPERIENCE THAT LEADS TO IMPROVED LEARNING AND RESULTS

How many students think they know everything about human development but struggle on the first exam? Students study more effectively with Connect and SmartBook.

Connect's assignments help students contextualize what they've learned through application, so they can better understand the material and think critically. Connect reports deliver information regarding performance, study behavior, and effort so instructors can quickly identify students who are having issues or focus on material that the class hasn't mastered.

SmartBook™ personalizes student learning to individual student needs, continually adapting to pinpoint knowledge gaps and focus learning on topics that need the most attention. Study time is productive and, as a result, students are better prepared for class and coursework. For instructors, SmartBook tracks student progress and provides insights that can help guide teaching strategies.

SmartBook is now optimized for mobile and tablet and is accessible for students with disabilities. Content-wise, it has been enhanced with improved learning objectives that are measurable and observable to improve student outcomes.





## APPLY CONCEPTS AND THEORY IN AN IMMERSIVE LEARNING ENVIRONMENT

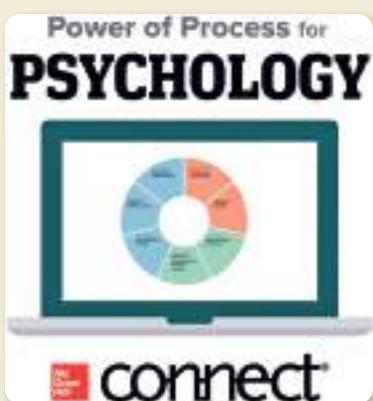
An engaging and innovative learning game, **Quest: Journey through the Lifespan**, provides students with opportunities to apply content from their human development curriculum to real-life scenarios. Students play unique characters of different ages who make decisions that apply key concepts and theories for each age as they negotiate events in an array of authentic environments. Additionally, as students analyze real-world behaviors and contexts, they are exposed to different cultures and intersecting biological, cognitive, and socioemotional processes. Each quest has layered replayability, allowing students to make new choices each time they play—or offering different students in the same class different experiences. Fresh possibilities and outcomes shine light on the complexity of and variations in real human development. This new experiential learning game includes follow-up questions, assignable in Connect and auto-graded, to reach a higher level of critical thinking.

## REAL PEOPLE, REAL WORLD, REAL LIFE



At the higher end of Bloom's taxonomy (analyze, evaluate, create), the McGraw Hill **Milestones** video series is an observational tool that allows students to experience life as it unfolds, from infancy to late adulthood. This groundbreaking, longitudinal video series tracks the development of real children as they progress through the early stages of physical, social, and emotional development in their first few weeks, months, and years of life. Assignable and assessable within Connect Psychology, Milestones also includes interviews with adolescents and adults to reflect development through the entire life span.

New to this edition, Milestones are available in a more engaging, WCAG-compliant format. Ask your McGraw Hill representative about this upgrade.



## PREPARE STUDENTS FOR HIGHER-LEVEL THINKING

Also at the higher end of Bloom's taxonomy, **Power of Process** helps students improve critical-thinking skills and allows instructors to assess these skills efficiently and effectively in an online environment. Available through Connect, preloaded journal articles are available for instructors to assign. Using a scaffolded framework such as understanding, synthesizing, and analyzing, Power of Process moves students toward higher-level thinking and analysis.

## INFORM AND ENGAGE ON PSYCHOLOGICAL CONCEPTS

At the lower end of Bloom's taxonomy, students are introduced to **Concept Clips**—the dynamic, colorful graphics and stimulating animations that break down some of psychology's most difficult concepts in a step-by-step manner, engaging students and aiding in retention. They are assignable and assessable in Connect or can be used as a jumping-off point in class. For example, there are Concept Clips on topics such as object permanence and conservation, as well as theories and theorists such as

Bandura's social cognitive theory, Vygotsky's sociocultural theory, Buss's evolutionary theory, and Kuhl's language development theory.

New to this edition, Concept Clips feature a more modern visual style, updated scripts and assessment items, and enhanced accessibility.

At varied levels of Bloom's taxonomy:

- **Newsflash.** Located in Connect, **NewsFlash** is a multimedia assignment tool that ties current news stories, TedTalks, blogs, and podcasts to key psychological principles and learning objectives. Students interact with relevant news stories and are assessed on their ability to connect the content to the research findings and course material. NewsFlash is updated twice a year and uses expert sources to cover a wide range of topics, including emotion, personality, stress, drugs, COVID-19, ableism, disability, social justice, stigma, bias, inclusion, gender, LGBTQ+, and many more.
- **Interactivities.** Assignable through Connect, **Interactivities** engage students with content through experiential activities. New and updated activities include Neurons, Research Ethics, Prenatal Development, Kohlberg's Moral Reasoning, and Gardner's Theory of Multiple Intelligences.



## WRITING ASSIGNMENTS

New to this edition and found in Connect, **Writing Assignments** offer faculty the ability to assign a full range of writing tasks to students with just-in-time feedback.

You may set up manually scored assignments in a way that students can:

- automatically receive grammar and high-level feedback to improve their writing before they submit a project to you;
- run originality checks and receive feedback on “exact matches” and “possibly altered text” that includes guidance about how to properly paraphrase, quote, and cite sources to improve the academic integrity of their writing before they submit their work to you.

## POWERFUL REPORTING

Whether a class is face-to-face, hybrid, or entirely online, Connect provides tools and analytics to reduce the amount of time instructors need to administer their courses.

Easy-to-use course management tools allow instructors to spend less time administering and more time teaching, while easy-to-use reporting features allow students to monitor their progress and optimize their study time.

- The **At-Risk Student Report** provides instructors with one-click access to a dashboard that identifies students who are at risk of dropping out of the course due to low engagement levels.
- The **Category Analysis Report** details student performance relative to specific learning objectives and goals, including APA outcomes and levels of Bloom's taxonomy.
- The **SmartBook Reports** allow instructors and students to easily monitor progress and pinpoint areas of weakness, giving each student a personalized study plan to achieve success.

The resources listed here accompany *Experience Human Development*, Fifteenth Edition. Please contact your McGraw Hill representative for details concerning the availability of these and other valuable materials that can help you design and enhance your course.

**Instructor's Manual** Broken down by chapter, this resource provides chapter outlines, suggested lecture topics, classroom activities and demonstrations, suggested student research projects, essay questions, and critical-thinking questions.

**PowerPoint Presentations** The PowerPoint presentations, now with improved accessibility, highlight the key points of the chapter and include supporting visuals. All the slides can be modified to meet individual needs.

**Test Bank and Test Builder** Organized by chapter, the questions are designed to test factual, conceptual, and applied understanding; all test questions are available within Test Builder. Available in Connect, Test Builder is a cloud-based tool that enables instructors to format tests that can be printed, administered within a Learning Management System, or exported as a Word document of the test bank. Test Builder offers a modern, streamlined interface for easy content configuration that matches course needs, without requiring a download. Test Builder allows you to:

- Access all test bank content from a particular title
- Easily pinpoint the most relevant content through robust filtering options
- Manipulate the order of questions or scramble questions and/or answers
- Pin questions to a specific location within a test
- Determine your preferred treatment of algorithmic questions
- Choose the layout and spacing
- Add instructions and configure default settings

Test Builder provides a secure interface for better protection of content and allows for just-in-time updates to flow directly into assessments.

**Remote Proctoring and Browser-Locking Capabilities** Remote proctoring and browser-locking capabilities, hosted by Proctorio within Connect, provide control of the assessment environment by enabling security options and verifying the identity of the student.

Seamlessly integrated within Connect, these services allow instructors to control students' assessment experience by restricting browser activity, recording students' activity, and verifying students are doing their own work. Instant and detailed reporting gives instructors an at-a-glance view of potential academic integrity concerns, thereby avoiding personal bias and supporting evidence-based claims.

# acknowledgments

## Research in Action

In this new edition of *Experience Human Development*, McGraw Hill has partnered with a diverse set of emerging voices in academia. I am grateful to the following graduate students and early career academics for their contributions to an entirely new series of Research in Action features, all focused on issues relevant to diversity in scientific research.

### Intersectionality and Inequity in Human Development (Chapter 1)

**Kristen Jaramillo** is a PhD student at Texas A&M University. Her research interests include diversity and discrimination in the workplace with a focus on how the intersection of multiple identities differentially impacts individuals at work. Upon graduation, she hopes to become a professor in Industrial/Organizational Psychology.



Christine Wright

### Broadening the Narrative: Diversity in Psychological Research (Chapter 2)

**Nevita George** is a doctoral student in the Clinical Health Psychology program at the University of Colorado, Denver. Nevita's interests include amplifying minority voices to responsively address health and health care disparities burdening young women of color, particularly South Asian women. She hopes to continue working with minority youth as a clinical health psychologist in an academic medical setting.



Nevita George

### Indigenous Motherhood (Chapter 3)

**Alana Egan** is a first-year PhD student in the University of Rhode Island's Clinical Psychology program. Her research focuses on health disparities in indigenous populations with a special interest in Native Hawaiians.



Alana Egan



Erica Boucher

### Should I Stay or Should I Go? Disparities in the Use of Parental Leave (Chapter 4)

**Erica Boucher** is a PhD student in the Industrial and Organizational Psychology program at Clemson University. Her research focuses on discrimination and equality issues in the workplace with a primary focus on gender discrimination.



Robert Ewing

### Strength versus Deficit: Contextualizing Research in Language Development (Chapter 5)

**Marissa Castellana** is a Developmental Psychology PhD student at Arizona State University. She studies dual language development in infants and children, examining the role of language input in children's bilingual language learning. She plans to become a professor and improve education policy for children learning English as a second language.



Adrianna E. Crossing

### Cultural Considerations in the Diagnosis of Autism Spectrum Disorder (Chapter 6)

**Adrianna E. Crossing, MA**, a predoctoral intern at Massachusetts General Hospital and Harvard Medical School, is completing their PhD in School Psychology from Michigan State University. Their research interests include critical race theory applications in psychology, evidence-based psychological interventions for children, and social justice training for graduates and early-career professionals in health service psychology.



Sejal Mistry-Patel

### Health Risks of Screen Time during COVID-19 (Chapter 7)

**Sejal Mistry-Patel** is a PhD student in the Cognition and Cognitive Neuroscience program at Texas A&M University. Her work aims to clarify the neurobehavioral trajectories of childhood anxiety risk, with a focus on maternal health, parent-child associations, and environmental contributions. Ultimately, Sejal's goal is to work to enhance positive emotional outcomes for families.

### **Lights, Camera, Representation: BIPOC Children’s Exposure to Violent Digital Media (Chapter 8)**

**Kidist Beker** is a Clinical Psychology student at the University of Tulsa. She is particularly interested in minority mental health and resiliency. Upon graduation, she seeks to provide mental health services to underserved communities.



Kidist Beker

### **Compounding Disadvantage: Educational Access in the Age of COVID-19 (Chapter 9)**

**Timothy Regan** is a PhD student in Clinical Psychology at Texas A&M University. He is currently a Psychology Resident at the University of Mississippi Medical Center. His interests include executive functioning, substance use, and technology interventions. His professional goal is to implement computer-mediated interventions for health behavior change in an academic medical setting.



Timothy Regan

### **“The Talk”: Racial Socialization in African American Families (Chapter 10)**

**Tahra Cassidy Anglade** is a student in the Experimental Psychology MS program at Seton Hall University. Her research interests include exploring racial socialization and racial/ethnic identity as protective factors against racism-related stress/trauma. Tahra will continue her research as a student in Howard University’s Clinical Psychology PhD Program.



Tahra Cassidy Anglade

### **Who Are You? Puberty and LGBTQ+ Identity Development (Chapter 11)**

**Jaidelynn Rogers** is a PhD candidate in Counseling Psychology at Southern Illinois University Carbondale. Her research interests broadly align with LGBTQ+ themes, relationship satisfaction and couples therapy, and fatphobia and weight stigma research. Jaidelynn hopes to open her own private practice providing LGBTQ+ care, couples therapy, and assessments in the St. Louis area.



Jaidelynn Rogers



### LGBTQ+ Inclusivity in Sex Education (Chapter 12)

**Sarah Wheat** is a PhD student in Experimental Social Psychology at New Mexico State University. Her research focuses on how we learn about sex, specifically on sexual shame and the experiences of LGBTQ+ youth in formal and informal sexual education. Sarah is passionate about undergraduate psychology curriculum development and public policy.

Sarah Wheat



### Hidden Disability: Rheumatoid Arthritis in Young Adults (Chapter 13)

**Nelcida Garcia** recently earned a Ph.D. in Development Psychology from Florida International University. Her dissertation examined the role of mothers and the home environment on children's early spatial skills. Currently, she works in the Research and Evaluation department of a large nonprofit focused on positive child and youth development and teaches child development courses.

Nelcida Garcia



### Interracial Dating (Chapter 14)

**Naquan Ross** has an MS from Seton Hall University and is currently in Ohio University's PhD Experimental Psychology program. His research interests are in attraction, emotional regulation, dating, and relationship formation in nonplatonic relationships. His goal is to lead and conduct user experience research around dating to foster better relationships in society.

Andi Guarin



### Hard Times: Financial Stress at Midlife (Chapter 15)

**Baylor Graham** is a doctoral student at Clemson University in the Industrial and Organizational Psychology program. She focuses on Occupational Health Psychology, and her research interests include employee health and well-being, economic stress, work-family interface, and diversity, equity, and inclusion. Her goals include producing impactful research and inspiring others through teaching, mentorship, and worker advocacy.

Baylor Graham

### **Body Image and Well-Being at Midlife (Chapter 16)**

**Samantha Philip** is a doctoral student in Clinical Psychology at Texas A & M University. Her research and clinical interests lie at the intersection of weight stigma and health behaviors. Upon graduation, Samantha aspires to work at an academic medical center, where her work will contribute to dismantling weight stigma and diet culture.



Samantha Philip

### **The Psychological Consequences of Hearing Loss (Chapter 17)**

**Taylor Roberts** attended the Master's in Counseling Psychology program at Tennessee State University. Her research interests include working with adults experiencing individual and interpersonal reactions to stress and trauma such as COVID-19, occupational health, and disability status. In the future, she plans to work primarily with adults in a medium-sized hospital or Veterans Administration medical center.



Taylor Roberts

### **Technology and Aging in Place (Chapter 18)**

**Claire Textor** is a PhD candidate in Human Factors Psychology at Clemson University. Claire's research centers on human-automation interaction, specifically how individual differences relate to variations in performance and trust. She also conducts research into human-autonomy teaming with a focus on how unethical behavior affects trust. Claire hopes to evaluate, design, and improve systems for human use.



Claire Textor

### **Cultural Variations in Conceptions of Death (Chapter 19)**

**Kamal Middlebrook** received his MS in Educational Psychology from Georgia State University. Kamal is interested in examining psychometric evidence of educational and psychological measures to determine whether the measures and their interpretations are equitable and relevant to a diverse population. Kamal's goal is to work as a researcher, specializing in research methodology and analysis and survey research.



Kamal Middlebrook

### **The Fifteenth Edition**

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Kim Shifren, Towson University  
Dan Velisek, Waubonsee Community College

—Gabi Martorell



# EXPERIENCE **Human Development**



## outline

Human Development: An Evolving Field

Basic Concepts in Human Development

Influences on Development

The Life-Span Developmental Approach

## learning objectives

Describe human development and how its study has evolved.

Describe the domains and periods of human development.

Give examples of the influences that make one person different from another.

Discuss the principles of the life-span perspective.

# The Study of Human Development



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## did you know?

- As the world has become more diverse, the science of psychology has increasingly recognized the contributions of culture and context in shaping the developing human.
- In some societies, there is no concept of adolescence or middle age.
- Many scholars today agree that race is not a concept that can be defended on a biological basis.

*In this chapter, we set the stage for the many diverse aspects of human development discussed in this text. We identify key influences of development and show how they interrelate, outlining major developments during each period of life and the contexts in which each occurs. We also look at cultural, social, and economic influences on development, highlighting the immense diversity of experiences and people that make up our world.*



**T**he only lasting truth is change.

—Octavia Butler (1947–2006)

# Human Development: An Evolving Field

Development is lifelong. From the moment of conception, human beings begin a process of change that will continue until the last flicker of life ends. A single cell divides and divides again, over and over, in an orchestrated, organized fashion. Although each child born of this process is a unique individual, development is nonetheless patterned and orderly and follows a blueprint laid out by our evolutionary history. Eventually, a living, breathing, squalling infant is born and begins to be influenced by and to influence the surrounding world. Babies grow and become children, and then adolescents, and then adults. It is not until the heart ceases beating and the neurons of the brain stop firing that our stories end. These patterns of development are explored in this book.

The field of **human development** focuses on the scientific study of the systematic processes of change and stability in people. Developmental scientists look at ways in which people change from conception through maturity as well as at characteristics that remain fairly stable. The work of developmentalists can have a dramatic impact on people's lives. Research findings often have applications to child rearing, education, health, and social policy.

## STUDYING THE LIFE SPAN

When the field of developmental psychology emerged as a scientific discipline, most researchers focused their energies on infant and child development. Growth and development are more obvious during these times given the rapid pace of change. As the field matured, however, it became clear that development included more than infancy and childhood. Now researchers consider **life-span development** to be from "womb to tomb," comprising the entire human life span from conception to death. Moreover, they acknowledge that **development can be either positive** (e.g., becoming toilet trained or enrolling in a college course after retirement) or **negative** (e.g., once again wetting the bed after a traumatic event or isolating after retirement). For these reasons, events such as the timing of parenthood, maternal employment, and marital satisfaction are now also studied as part of developmental psychology.

Moreover, as the field of human development itself developed, its goals came to include not just description but also explanation, prediction, and intervention. For example, to **describe** when most children say their first word or how large their vocabulary is at a certain age, developmental scientists observe large groups of children and establish norms, or averages, for behavior at various ages. They then attempt to **explain** how children acquire language and why some children learn to speak later than usual. This knowledge may make it possible to **predict** future behavior, such as the likelihood that a child **will have serious speech problems**. Finally, an understanding of how language develops may be used to **intervene** in development, for example, by giving a child speech therapy.

The scientific study of human development is ever evolving. The questions that developmental scientists try to answer, the methods they use, and the explanations they propose are more sophisticated and more varied than they were even five years ago. These shifts reflect progress in understanding as new investigations build on or challenge those that went before. They also reflect advances in technology. Scientists now have access to **sensitive instruments** that measure eye movement, heart rate, and muscle tension. They are able to use digital technology to analyze how mothers and babies communicate. Advances in brain



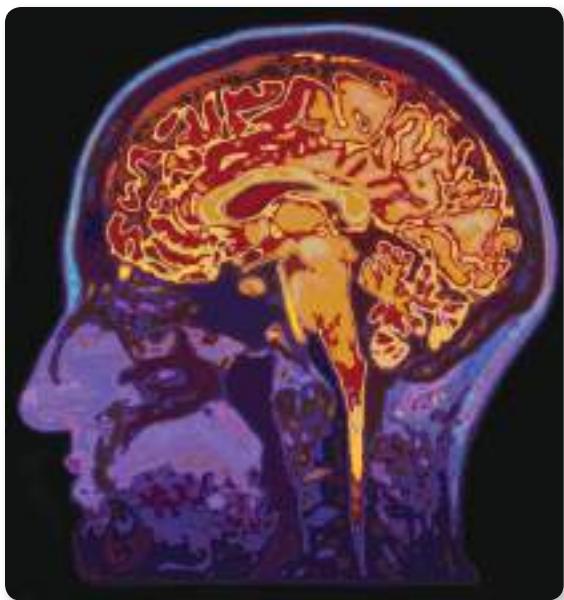
Research in developmental psychology often has implications for life outside of the laboratory. For example, Mamie and Kenneth Clark were among first psychologists to testify in court, presenting their research on racial self-awareness in children in the historic Brown v. Board of Education case ending segregation in the United States.

### human development

Scientific study of processes of change and stability throughout the human life span.

### life-span development

Concept of human development as a lifelong process, which can be studied scientifically.



*Brain imaging techniques, such as functional magnetic resonance imaging (fMRI), positron emission tomography (PET), and electroencephalogram (EEG), are used to map where certain thought processes take place within the structure of the brain.*

SpeedKingz/Shutterstock

*Disparities in science exist online too: A recent study involving over a half a million scholars showed women's research is mentioned far less frequently than that of men (Vásárhelyi et al., 2021).*



## checkpoint can you...

- Identify four goals of the scientific study of human development?
- Describe the evolution of the field of developmental psychology?
- Discuss the importance of diversity for scientific research?

### physical development

Growth of body and brain, including patterns of change in sensory capacities, motor skills, and health.

imaging make it possible to probe the mysteries of temperament or to compare a normally aging brain with the brain of a person with dementia.

Additionally, as the field has progressed, it has become increasingly apparent that the traditional canon of researchers is insufficient for any true understanding of the complexity of human development. Majority group members, most often white men, were the predominant gatekeepers of scientific thought and the producers of the bulk of theory and research (Roberts et al., 2020). However, the science of developmental psychology should be as diverse and varied as the people it studies. The inclusion of diverse voices is important not just because the science is higher quality when such voices are heard but also so the field of developmental psychology reflects the experiences and concerns of the diverse, interconnected societies and cultures of today.

Last, development is messy. It's complex and multifaceted and shaped by interacting arcs of influence. Thus, development is best understood with input from a variety of theoretical and research orientations and is most appropriately studied using multiple disciplines. Not surprisingly, the study of development has been interdisciplinary almost from the start (Parke, 2004). Students of human development draw collaboratively from a wide range of disciplines, including psychology, psychiatry, sociology, anthropology, biology, genetics, family science, education, history, and medicine. This text includes findings from research in all these fields.

# Basic Concepts in Human Development

Developmentalists study processes of change and stability in all domains, or aspects, of development throughout all periods of the life span.

## DOMAINS OF DEVELOPMENT

Developmental scientists study three major domains, or aspects, of the self: physical, cognitive, and psychosocial. Growth of the body and brain, sensory capacities, motor skills, and health are parts of **physical development**. Learning, attention, memory, language, thinking, reasoning, and creativity make up **cognitive development**. Emotions, personality, and social relationships are aspects of **psychosocial development**.

Although in this book we talk separately about physical, cognitive, and psychosocial development, these domains are intricately interconnected. But to understand their complexity, we need to establish boundaries somewhere. Thus, we separate these spheres of influence. Despite this, it is important to remember that each aspect of development affects the others. Human development is a complex and tangled web of multiple influences, and understanding these influences requires thinking carefully about their interactions. Just as a fly caught on one thread of a spider web sends reverberations across the entire structure, development in one area sends ripples through all other areas.

For example, physical development affects cognitive and psychosocial development. A child with frequent ear infections may develop language more slowly than a child without this physical problem. During puberty, dramatic physical and hormonal changes affect the developing sense of self. Physical changes in the brains of some older adults may lead to intellectual and personality deterioration.

Similarly, cognitive advances and declines are related to physical and psychosocial development. A child who is precocious in language development may bring about positive reactions in others and thus gain self-worth. Memory development reflects gains or losses in physical connections in the brain. An adult who has trouble remembering people's names may feel shy in social situations.

And finally, psychosocial development can affect cognitive and physical functioning. Indeed, without meaningful social connections, physical and mental health suffer. Motivation and self-confidence are important contributors to school success, whereas negative emotions such as anxiety can impair performance. Researchers have even identified possible links between a conscientious personality and length of life.

## PERIODS OF THE LIFE SPAN

Division of the life span into periods is a **social construction**: a concept or practice that is an invention of a particular culture or society. Although we may consider stages of the lifespan such as childhood, adolescence, adulthood, and old age to be invariant chronological categories, the reality is these concepts may not exist in many cultures or, if they do exist, are conceptualized differently.

For instance, because the concept of childhood is a social construction, the form it takes varies across cultures, and there are suggestions that childhood as we know it is a relatively new invention. In early hominids, bone analyses of skeletons suggest children participated in adult activities such as hunting and tool use and that middle childhood as we understand it now did not exist in such populations (Thompson & Nelson, 2011). In the Middle Ages, an analysis of figurative art suggested childhood was viewed as being composed of two stages. Children were first seen as babies/toddlers, a stage in which they were not expected to care for themselves or speak. Then, once past this stage, children were viewed as nascent adults, and although they were not expected to carry out the full duties of adulthood, they were expected to work alongside their elders (Aries, 1962). Similarly, in contrast to the relative freedom children have in the United States today, young children in Colonial times were expected to do adultlike tasks such as knitting socks and spinning wool (Ehrenreich & English, 2005). By contrast, Inuit parents in the Canadian Arctic believe that young children are not yet capable of thought and reason and therefore are lenient when their children cry or become angry. But parents on the Pacific Island of Tonga regularly beat 3- to 5-year-olds, whose crying is attributed to willfulness (Briggs, 1970; Morton, 1996). These examples collectively illustrate the variability with which different cultures have viewed childhood.

A similar construction involves adolescence, which is a recent concept that emerged as society became more industrialized. Until the early twentieth century, young people in the United States were considered children until they left school, married, or got a job, and entered the adult world. By the 1920s, with the establishment of comprehensive high schools to meet the needs of a growing economy and with more families able to support extended formal education for their children, the teenage years became a distinct, and longer, period of development (Keller, 1999). By contrast, in many cultures, including those in rural Morocco, some Inuit tribes, and rural Chinese villages, marriage quickly follows puberty (Lancy, 2014). In some preindustrial societies, such as the Chippewa Indians, the concept of adolescence still does not exist. The Chippewa have only two periods of childhood: from birth until the child walks and from walking to puberty. What we call adolescence is part of adulthood (Broude, 1995).

In this book, we follow a sequence of eight periods generally accepted in Western industrial societies. After describing the crucial changes that occur in the first period, before birth, we trace all three domains of development through infancy and toddlerhood, early childhood, middle childhood, adolescence, emerging and young adulthood, middle adulthood, and late adulthood (Table 1). For each period after infancy and toddlerhood, we have combined physical and cognitive development into a single chapter.



*These children are engaging in all three domains of development: sensory perception (physical development), learning (cognitive development), and social relationships building (psychosocial development).*

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### cognitive development

Pattern of change in mental abilities, such as learning, attention, memory, language, thinking, reasoning, and creativity.

### psychosocial development

(1) Pattern of change in emotions, personality, and social relationships. (2) In Erikson's eight-stage theory, the socially and culturally influenced process of development of the ego, or self.

### social construction

A concept or practice that may appear natural and obvious to those who accept it but that in reality is an invention of a particular culture or society.

**TABLE 1** Typical Major Developments in Eight Periods of Human Development

Age Period	Physical Developments	Cognitive Developments	Psychosocial Developments
<b>Prenatal Period (conception to birth)</b>	<p>Conception occurs by normal fertilization or other means.</p> <p>The genetic endowment interacts with environmental influences from the start.</p> <p>Basic body structures and organs form; brain growth spurt begins.</p> <p>Physical growth is the most rapid in the life span.</p> <p>Vulnerability to environmental influences is great.</p>	Abilities to learn and remember and to respond to sensory stimuli are developing.	Fetus responds to mother's voice and develops a preference for it.
<b>Infancy and Toddlerhood (birth to age 3)</b>	<p>All senses and body systems operate at birth to varying degrees.</p> <p>The brain grows in complexity and is highly sensitive to environmental influence.</p> <p>Physical growth and development of motor skills are rapid.</p>	<p>Abilities to learn and remember are present, even in early weeks.</p> <p>Use of symbols and ability to solve problems develop by end of second year.</p> <p>Comprehension and use of language develop rapidly.</p>	<p>Attachments to parents and others form.</p> <p>Self-awareness develops.</p> <p>Shift from dependence toward autonomy occurs.</p> <p>Interest in other children increases.</p>
<b>Early Childhood (ages 3 to 6)</b>	<p>Growth is steady; appearance becomes more slender and proportions more adultlike.</p> <p>Appetite diminishes, and sleep problems are common.</p> <p>Handedness appears; fine and gross motor skills and strength improve.</p>	<p>Thinking is somewhat egocentric, but understanding of other people's perspectives grows.</p> <p>Cognitive immaturity results in some illogical ideas about the world.</p> <p>Memory and language improve.</p> <p>Intelligence becomes more predictable.</p> <p>Preschool experience is common, and kindergarten experience is more so.</p>	<p>Self-concept and understanding of emotions become more complex; self-esteem is global.</p> <p>Independence, initiative, and self-control increase.</p> <p>Gender identity develops.</p> <p>Play becomes more imaginative, more elaborate, and usually more social.</p> <p>Altruism, aggression, and fearfulness are common.</p> <p>Family is still the focus of social life, but other children become more important.</p>
<b>Middle Childhood (ages 6 to 11)</b>	<p>Growth slows.</p> <p>Strength and athletic skills improve.</p> <p>Respiratory illnesses are common, but health is generally better than at any other time in the life span.</p>	<p>Egocentrism diminishes.</p> <p>Children begin to think logically but concretely.</p> <p>Memory and language skills increase.</p> <p>Cognitive gains permit children to benefit from formal schooling.</p> <p>Some children show special educational needs and strengths.</p>	<p>Self-concept becomes more complex, affecting self-esteem.</p> <p>Coregulation reflects gradual shift in control from parents to child.</p> <p>Peers assume central importance.</p>

**TABLE 1** Typical Major Developments in Eight Periods of Human Development

Age Period	Physical Developments	Cognitive Developments	Psychosocial Developments
<b>Adolescence (ages 11 to about 20)</b>	<p>Physical growth and other changes are rapid and profound.</p> <p>Reproductive maturity occurs.</p> <p>Major health risks arise from behavioral issues, such as eating disorders and drug abuse.</p>	<p>Ability to think abstractly and use scientific reasoning develops.</p> <p>Immature thinking persists in some attitudes and behaviors.</p> <p>Education focuses on preparation for college or vocation.</p>	<p>Search for identity, including sexual identity, becomes central.</p> <p>Relationships with parents are generally good.</p> <p>Peer group may exert a positive or negative influence.</p>
<b>Emerging and Young Adulthood (ages 20 to 40)</b>	<p>Physical condition peaks, then declines slightly.</p> <p>Lifestyle choices influence health.</p>	<p>Thought and moral judgments become more complex.</p> <p>Educational and occupational choices are made, sometimes after period of exploration.</p>	<p>Personality traits and styles become relatively stable, but changes in personality may be influenced by life stages and events.</p> <p>Intimate relationships and personal lifestyles are established but may not be lasting.</p> <p>Most people marry, and most become parents.</p>
<b>Middle Adulthood (ages 40 to 65)</b>	<p>Slow deterioration of sensory abilities, health, stamina, and strength may begin, but individual differences are wide.</p> <p>Women experience menopause.</p>	<p>Mental abilities peak; expertise and practical problem-solving skills are high.</p> <p>Creative output may decline but improve in quality.</p> <p>For some, career success and earning powers peak; for others, burnout or career change may occur.</p>	<p>Sense of identity continues to develop; midlife transition may occur.</p> <p>Dual responsibilities of caring for children and parents may cause stress.</p> <p>Launching of children leaves empty nest.</p>
<b>Late Adulthood (age 65 and over)</b>	<p>Most people are healthy and active, although health and physical abilities generally decline.</p> <p>Slowing of reaction time affects some aspects of functioning.</p>	<p>Most people are mentally alert.</p> <p>Although intelligence and memory may deteriorate in some areas, most people find ways to compensate.</p>	<p>Retirement from workforce may occur and may offer new options for use of time.</p> <p>People develop more flexible strategies to cope with personal losses and impending death.</p> <p>Relationships with family and close friends can provide important support.</p> <p>Search for meaning in life assumes central importance.</p>

The age divisions shown in Table 1 are approximate and somewhat arbitrary. This is especially true of adulthood, when there are no clear-cut social or physical landmarks, such as starting school or entering puberty, to signal a shift from one period to another.

Although individual differences exist in the way people deal with the characteristic events and issues of each period, developmentalists suggest that certain basic needs must be met and certain tasks mastered for typical development to occur, at least within the context of modern life. Infants, for example, are dependent on adults for food, clothing, and shelter as well as for human contact and affection. They form attachments to parents and caregivers, who also become attached to them. With the development of speech and self-locomotion, toddlers become more self-reliant; they need to assert their autonomy but also need parents to set limits on their behavior. During early childhood, children gain more self-control and become more interested in other children. During middle childhood, control over behavior gradually shifts from parent to child, and the peer group becomes increasingly important. A central task of adolescence is the search for identity—personal, sexual, and occupational. As adolescents become physically mature, they deal with conflicting needs and emotions as they prepare to leave the parental nest.

During emerging adulthood, an exploratory period in the early to midtwenties, many people are not yet ready to settle down to the typical tasks of young adulthood: establishing independent lifestyles, occupations, and families. By the thirties, most adults have successfully fulfilled those tasks. During middle adulthood, some decline in physical capabilities is likely. At the same time, many middle-aged people find excitement and challenge in life changes—launching new careers and adult children—while some face the need to care for elderly parents. In late adulthood, people need to cope with losses in their faculties, the loss of loved ones, and preparations for death. If they retire, they must deal with the loss of work-based relationships but may get increased pleasure out of friendships, family, volunteer work, and the opportunity to explore previously neglected interests. Many older people become more introspective, searching out the meaning of their lives.

## checkpoint can you...?

- Identify the three domains of development and give examples of how they are interrelated?
- Name eight periods of human development and list several key issues or tasks of each period?

# Influences on Development

What makes each person unique? Although students of development are interested in the universal processes of development experienced by all normal human beings, they also study **individual differences** in characteristics, influences, and developmental outcomes. People differ in gender, height, weight, and body build; in health and energy level; in intelligence; and in temperament, personality, and emotional reactions. The contexts of their lives differ too: the homes, communities, and societies they live in, the relationships they have, the schools they go to (or whether they go to school at all), and how they spend their free time. Every person has a unique developmental trajectory, an individual path to follow. One challenge in developmental psychology is to identify the universal influences on development and then apply those to understanding individual differences in developmental trajectories.

## HEREDITY, ENVIRONMENT, AND MATURATION

Influences on development can be described in two primary ways. Some influences are internal and driven by **heredity** and biological processes. Heredity can be conceptualized as the genetic roll of the dice. It consists of the inborn traits and characteristics provided by a child's biological parents. Other influences stem from the **environment** outside the body, starting at conception with the prenatal environment in the womb and continuing throughout life. The relative influence of nature (heredity and biological processes) and nurture (environmental influences) is fiercely debated, and theorists differ in the weight they assign to each.

### heredity

Inborn traits or characteristics inherited from the biological parents.

### environment

Totality of nonhereditary, or experiential, influences on development.

Today scientists have found ways to measure more precisely the roles of heredity and environment in the development of specific traits within a population. When we look at a particular person, however, research with regard to almost all characteristics points to a blend of inheritance and experience. For example, although intelligence is strongly influenced by heredity, it is also affected by parental stimulation, education, peer influences, and other variables. Contemporary theorists and researchers are more interested in finding ways to explain how nature and nurture work together than in arguing about which factor is more important.

Many typical changes of infancy and early childhood, such as the abilities to walk and talk, are tied to **maturity** of the body and brain—the unfolding of a natural sequence of physical changes and behavior patterns. As children grow into adolescents and then into adults, individual differences in innate characteristics and life experience play a greater role. Throughout life, however, maturation continues to influence certain biological processes, such as brain development.

Even in processes that all people undergo, rates and timing of development vary. Throughout this book, we talk about average ages for the occurrence of certain events: the first word, the first step, the first menstruation or nocturnal emission, the development of logical thought, and menopause. But these ages are merely averages, and there is wide variation among people with respect to these norms. Only when deviation from the average is extreme should we consider development exceptionally advanced or delayed.

To understand development then, we need to look at the inherited characteristics that give each person a start in life. We also need to consider the many environmental factors that affect development, especially such major contexts as family, neighborhood, socioeconomic status, race/ethnicity, and culture. We need to consider how heredity and environment interact. We need to understand which developments are primarily maturational and which are not. We need to look at influences that affect many or most people at a certain age or a certain time in history and also at those that affect only certain individuals. Finally, we need to look at how timing can accentuate the impact of certain influences.

## CONTEXTS OF DEVELOPMENT

Human beings are social beings. From the beginning, they develop within a social and historical context. For an infant, the immediate context normally is the family, but the family in turn is subject to the wider and ever-changing influences of neighborhood, community, and society. There is no one dominant family form. There are increasing numbers of single and childless adults, unmarried parents, gay and lesbian households, and mixed-race households (Krogstad, 2014). Families are best described as being characterized by diversity.

**Family** The **nuclear family** is a household unit consisting of one or two parents and their children, whether biological, adopted, or stepchildren. Historically, the two-parent nuclear family was the normative family unit in the United States and other Western societies. In the United States in 1960, 73 percent of children lived in families with two married parents in their first marriage, and 37 percent of households were composed of nuclear families. In 2014, only 69 percent of children and 16 percent of households could be described in the same fashion (Pew Research Center, 2015). Globally, this pattern can be found in approximately 51 percent of families with children under the age of 18 (Kramer et al., 2019).

In many societies in Asia, Africa, and Latin America and among some US families that trace their lineage to those countries, the **extended family**—a multigenerational network of grandparents, aunts, uncles, cousins, and more distant relatives—is the traditional family form. Many people live in extended-family households, where they have daily contact with kin. Adults often share breadwinning and child-raising responsibilities, and older children are responsible for younger brothers and sisters.



Take calluses as an example. To get a callus, you have to have "callus-making" genes of some sort. However, without the environmental input of repeated friction on your skin, a callus would never form. So are calluses more nature or more nurture? The answer is they are both: They would not exist without both influences.

### maturation

Unfolding of a natural sequence of physical and behavioral changes.

### nuclear family

Two-generational kinship, economic, and household unit consisting of one or two parents and their biological children, adopted children, or stepchildren.

### extended family

Multigenerational kinship network of parents, children, and other relatives, sometimes living together in an extended-family household.

*How do the changes in family structure affect society? Most people in the US—about 45 percent—don't think it makes much of a difference. About 30 percent think the increased diversity in family structure is a good thing, and 16 percent don't like it (Thomas, 2020).*



#### **polygamy**

Family structure in which one spouse, most commonly a man, is married to more than one partner.

#### **socioeconomic status (SES)**

Combination of economic and social factors describing an individual or family, including income, education, and occupation.

*An extended-family household might include grandparents, aunts, and cousins.*

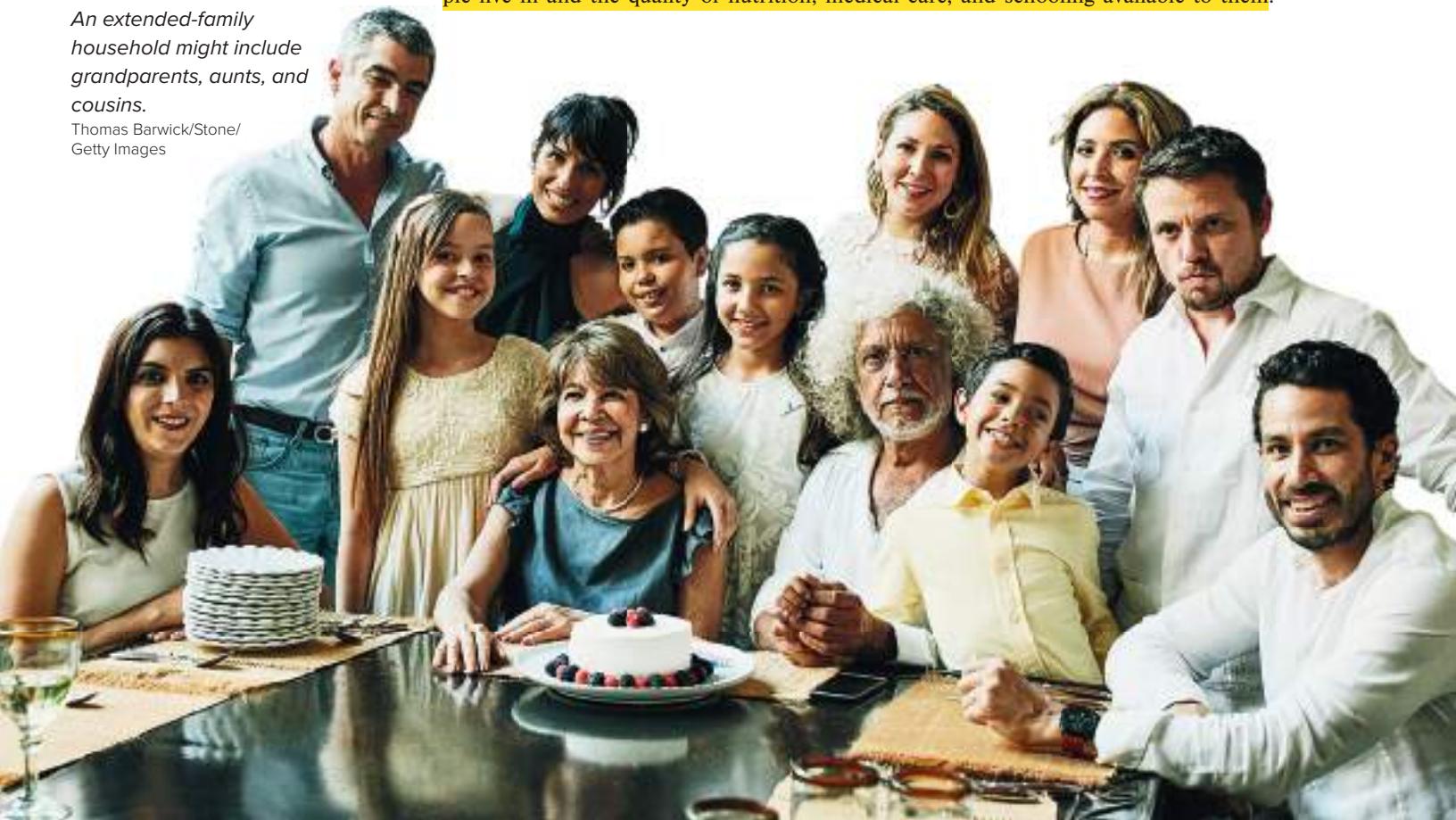
Thomas Barwick/Stone/  
Getty Images

Extended family living arrangements are the most common globally and are found in approximately 38 percent of the total population (Kramer, 2020) and 51 percent of families with children (Kramer et al., 2019). Today the extended-family household is becoming slightly less typical in some developing countries (Bradbury et al., 2014) due in part to industrialization and migration to urban centers (Kinsella & Phillips, 2005). Meanwhile, in the United States, economic pressures, housing shortages, and out-of-wedlock childbearing have helped to fuel a trend toward three- and even four-generation family households. In 2016, a record 20 percent of the US population, or 64 million people, lived in multi-generational families. This number has been steadily increasing since the low reached in the early 1980s (Cohn & Passel, 2018).

Multigenerational households have become more common in countries like the United States for a variety of reasons. First, both men and women are marrying at later ages and thus remaining at home for longer than was previously typical. Second, there has been an influx of immigrant populations since 1970, and these immigrants are more likely than native-born families to seek out multigenerational homes for reasons of practicality as well as preference. Indeed, even among nonimmigrants, race and ethnicity play a part. Latinos, African Americans, and Asians are all more likely to live in multi-generational families than are Whites. Another reason for the increase in multigenerational households is that people are living longer, and elderly parents may sometimes benefit from inclusion in their children's households (Krogstad, 2015). Last, a decrease in marriage and an increase in single parenthood are also fueling the change to extended family living patterns (Pilkauskus & Cross, 2018).

Other types of family structures are more rare. Worldwide, only about 7 percent of families with children are headed by a single parent. The United States, at 23 percent, has the highest rate of single-parent families across the globe (Kramer, 2020). Polygamy, a family structure in which one parent (most commonly the father) is married to multiple spouses, is even more unusual. Polygamous families are found in about 3 percent of households, primarily within Muslim countries (Kramer et al., 2019).

**Socioeconomic Status** A family's socioeconomic status (SES) is based on family income and the educational and occupational levels of the adults in the household. Many developmental processes are affected by SES. For example, SES affects developmental processes and outcomes indirectly through the kinds of homes and neighborhoods people live in and the quality of nutrition, medical care, and schooling available to them.



In 2017, approximately 689 million people in the world, half of whom were children, lived on less than \$1.90 a day. While this is a staggering number, it nonetheless represented slow but steady improvement in global poverty rates over the last two decades. In 2020, however, the **COVID-19** pandemic reversed that trend. Estimates are that as many as 90 million additional people were forced into extreme poverty as a result of the pandemic (Lakner et al., 2022; Figure 1). Middle-income countries that had made recent gains, such as India and Nigeria, were the most profoundly affected. Additionally, while prior to COVID-19, the majority of people living in extreme poverty were young, poorly educated, and lived in rural areas (World Bank, 2019), the “new poor” are likely to be from urban areas most affected by lockdowns and restrictions (World Bank, 2022).

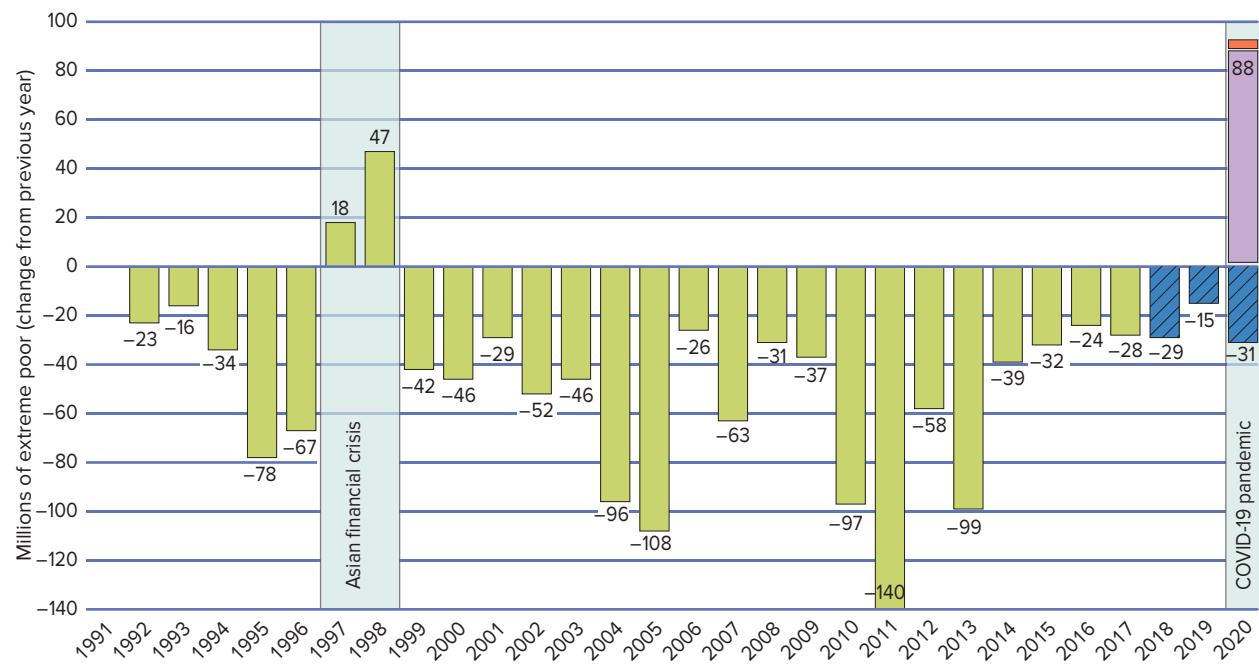
In addition to the pandemic, climate change is exerting a negative effect on attempts to raise people out of poverty. Estimates are that by 2030, between 68 to 132 million additional people will be driven into extreme poverty by climate change, most notably in areas such as sub-Saharan Africa and South Asia (World Bank, 2021). Moreover, the 2022 war in Ukraine and growing inflation are also predicted to exacerbate existing problems, particularly at the lowest income levels (Mahler et al., 2022).

Poverty is also an issue in the United States. Race or ethnicity are often associated with SES. In 2020, African American children (31 percent), Native American (31 percent), and Hispanic children (23 percent) were far more likely to live in poverty than their White or Asian counterparts (10 percent) (Annie E. Casey Foundation, 2021).

The COVID pandemic also affected poverty in the United States. Although government aid initially shielded many Americans from financial ruin, the reduction in aid in August 2020 led to historically rapid increases in poverty in the succeeding months. From June to December 2020, 6.7 million Americans fell beneath the poverty line.

#### COVID-19

A novel coronavirus disease causing fatigue, loss of sense of smell, fever, and respiratory distress; the source of the 2019 pandemic.



Note: Projections for the years 2018–2020 are based on updated estimates of Lakner et al. (2021). For 2020, we show both (a) the number of people that were expected to move out of extreme poverty had the COVID-19 pandemic not happened (pre-COVID-19 estimate of -31) and (b) the number of people who were expected to become poor due to COVID-19.

**FIGURE 1**

Annual Change in the Number of Extreme Poor (in Millions), 1992–2020

Source: Lakner et al. (2021).

One of the key symptoms reported by people infected with early variants of COVID-19 was loss of taste and smell. In late 2021, as COVID swept through the population, negative online reviews for Yankee Candles complaining of "no smell" for their scented products spiked alongside infections (Beauchamp, 2021).



#### risk factors

Conditions that increase the likelihood of a negative developmental outcome.

#### culture

A society's or group's total way of life, including customs, traditions, beliefs, values, language, and physical products—all learned behavior, passed on from parents to children.

#### individualistic culture

A culture in which people tend to prioritize personal goals ahead of collective goals and to view themselves as distinct individuals.

#### collectivistic culture

A culture in which people tend to prioritize collaborative social goals ahead of individual goals and to view themselves in the context of their social relationships.

#### ethnic group

A group united by ancestry, race, religion, language, or national origins, which contribute to a sense of shared identity.

#### ethnic minorities

Ethnic groups with national or cultural traditions different from the majority of the population.

Declines were most noticeable for Black people and people with low levels of education, exacerbating existing disparities (Han et al., 2020). In response, President Joe Biden signed the America Rescue Plan into law in March 2021, disbursing approximately 161 million payments of up to \$1,400 per person and an extension of pandemic unemployment benefits in some states. The provision of child tax credits benefits to lower- and middle-income families in the bill reduced child poverty by approximately half (Parolin et al., 2021).

This is important because poverty can damage children's and families' physical, cognitive, and psychosocial well-being. Poor children are more likely than other children to go hungry, to have frequent illnesses, to lack access to health care, to experience violence and family conflict, and to show emotional or behavioral problems (National Academies of Sciences Engineering and Medicine, 2019; Schickedanz et al., 2015; Eckenoede et al., 2014; Yoshikawa et al., 2012). Their cognitive potential and school performance suffer as well (Wolf et al., 2017; Hair et al., 2015).

The harm poverty does is often indirect through its impact on parents' emotional state and parenting practices and on the home environment. Threats to well-being multiply if, as often happens, several risk factors, conditions that increase the likelihood of a negative outcome, are present. Moreover, the earlier poverty begins, the longer it lasts, and the higher the concentration of poverty in the community in which children live, the worse the outcomes for those children are (Chaudry & Wimer, 2016).

However, negative effects of poverty are not inevitable. Positive development can still occur despite serious risk factors. For example, factors such as supportive parenting (Morris et al., 2017; Brody et al., 2017; Barton et al., 2018) or particular temperament profiles (Moran et al., 2017; Rudasill et al., 2017) can buffer children against ill effects. Consider Pulitzer Prize-winning author Maya Angelou; singer, songwriter, and activist Dolly Parton; rapper, songwriter, and record producer Jay-Z; and television talk show host and producer Oprah Winfrey, all of whom grew up in poverty.

**Culture** Culture refers to a society's or group's total way of life, including its customs, traditions, laws, knowledge, beliefs, values, language, and physical products, from tools to artworks—all of the behavior and attitudes that are learned, shared, and transmitted among members of a social group. Culture is constantly changing, often through contact with other cultures. Today cultural contact has been enhanced by computers and telecommunications. Email, texting, and social media sites offer almost instantaneous communication across the globe, and digital services such as iTunes give people around the world easy access to one another's music and movies.

Although cultures can vary in a multitude of ways, one of the primary contrasts involves the tension between individual and group goals. Some cultures, such as the United States, are individualistic. Individualistic cultures place a priority on personal goals and encourage people to view themselves as distinct individuals. Other cultures are collectivistic and are more concerned with collective goals and group dynamics. In these cultures, people are more likely to view themselves with respect to their relationships with others. These different orientations have far-reaching effects on psychological processes.

**Ethnicity and Race** An ethnic group consists of people united by a distinctive culture, ancestry, religion, language, or national origin, all of which contribute to a sense of shared identity and shared attitudes, beliefs, and values. Within large societies, ethnic groups may also be characterized by minority status. Ethnic minorities are those ethnic groups with national or cultural traditions different from the majority of the population, and they are often affected by prejudice and discrimination. An increasing number of the children being born today come from mixed racial or ethnic backgrounds (Alba, 2018). According to a 2016 estimate, 2.6 percent of the US population is of two or more races (Vespa et al., 2020).

By 2060 the US population is predicted to hit 417 million people (Colby & Ortman, 2015; Figure 2a and 2b). By around 2044, due to rising immigration and high birthrates

## INTERSECTIONALITY AND INEQUITY IN HUMAN DEVELOPMENT

Not all psychological influences are equally distributed. One important influence that affects BIPOC and White people differently is racism and discrimination. A large literature has documented the negative effects of discrimination and prejudice on both physical and mental health (Pascoe et al., 2009). Despite the efforts of advocates, racism, sexism, homophobia, and xenophobia are still prevalent. Moreover, discriminatory practices and behaviors can be directed in any one of these areas. So what happens when a person experiences multiple forms of discrimination at the same time by virtue of being in more than one identity category?

**Intersectionality** is an analytic framework focused on how a person's identities—including characteristics such as race, gender, age, sexuality, disability, socioeconomic status, and ethnicity—combine to create differences in discrimination or privilege (Hill & Bilge, 2020). This idea was first explored through the lens of Black women, examining the combination of racism and sexism they experience as distinct from that experienced by either Black men or White women (Crenshaw, 1989; King, 1988). For instance, after the Civil Rights Act of 1964 was passed, General Motors refused to hire Black women, arguing this was not discriminatory as they had hired both Black men and White women (Crenshaw, 1989). The intersection of multiple identities can lead to unique forms of discrimination and inequity, phenomena that continue to disproportionately impact some individuals today (Hebl et al., 2020).

Intersectionality can also be observed in the gender pay gap in America. On average, White women make 79% of what White, non-Hispanic men make in the same position. The influence of gender is further exacerbated by race, with Black women earning 63% and Latina women earning 55% of a White man's income (AAUW, 2020).

among immigrant families, ethnic minorities in the United States—roughly one-third of the population in 2008—are expected to become the majority. Because of this, the term traditionally used to describe these populations—minorities—may no longer be appropriate. More recently, in part as a response to the **Black Lives Matter** (BLM) movement resurgence of 2020, the person-first acronym **BIPOC** (Black, indigenous, and people of color) has been adopted to refer to these groups.

Ethnic and cultural patterns affect development by their influence on the composition of a household, its economic and social resources, the way its members act toward one another, the foods they eat, the games children play, the way they learn, how well they do in school, the occupations adults engage in, and the way family members think and perceive the world (Parke, 2004). For example, one study found that Hispanic

Unemployment can be investigated through an intersectional lens as well. The unemployment rate for transgender men and women is 15%, while the national unemployment average is 5% (James et al., 2016). This inequity is further compounded by race and ethnicity, as 20% of Black and 21% of Latin and Hispanic transgender men and women are unemployed (James et al., 2017; James & Salcedo, 2017).

The impact of intersecting identities was also evident during the COVID-19 pandemic. People of color were more likely to be unemployed when compared to their White counterparts. Women were also more likely to be jobless than men, and this was especially true for women of color (Sáenz & Sparks, 2020). Latina women experienced the highest rates of unemployment during the pandemic (20.8%), followed by Black women (14.2%).

Compounding identities do not always interact in a solely negative way. For example, gay Black men are seen as more hirable than heterosexual Black men; conversely, gay White men are considered less hirable than straight White men (Pedulla, 2014). Additionally, Asian women are paid 87% of what a White man earns (AAUW, 2020). Though this is still significantly lower than what a White man earns, it is higher than the earnings of the average White woman (79%), illustrating the numerous ways identities can interact (AAUW, 2020).



How do you think stereotypes influence the findings on intersectionality and inequity? How do your identities interact and impact your life?

### intersectionality

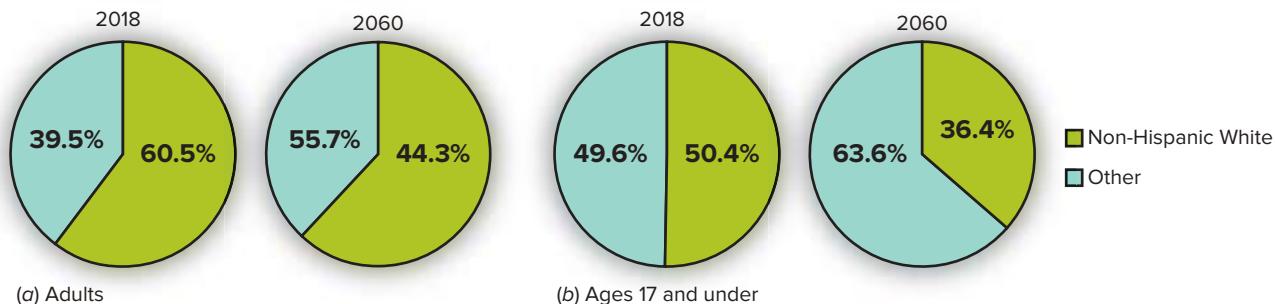
An analytic framework focused on how a person's multiple identities combine to create differences in privilege or discrimination.

### Black Lives Matter

A political and social movement focused on eliminating racially based violence against Black people through nonviolent protest and activism.

### BIPOC

Acronym standing for Black, indigenous and people of color.



**FIGURE 2**

## Population Projections for Non-Hispanic White and Minority Groups, 2018–2060

According to Census Bureau projections, the United States will become a minority-majority country by 2045, when minorities will comprise over 50 percent of the US population. The White population is overall older, slowly growing, and predicted to decline.

Sources: Colby & Ortman (2015); Frey, W. (2018).

immigrant parents were less likely to spank their young children than Hispanic parents born in the United States (Lee & Altschul, 2015). Presumably, those Hispanic families who had lived in the United States for longer had adopted US cultural norms on the appropriateness of corporal punishment as a disciplinary strategy for young children (Taylor et al., 2016). See Window on the World for a closer look at immigration patterns in the United States.

Categories of culture, race, and ethnicity are fluid and continuously redefined by social and political forces. Geographic dispersion and intermarriage together with adaptation to varying local conditions have produced a great heterogeneity of physical and cultural characteristics within populations (Smedley & Smedley, 2005). Thus, President Barack Obama, who has a Black, African father and a White, American mother, falls into more than one racial/ethnic category and may identify more strongly with one or another at different times (Hitlin et al., 2006).

It is worth considering what we mean when we speak of race. All humans belong to the same taxonomic classification—*Homo sapiens*. However, there are important differences in outward appearance of people from different geographical regions; note, for instance, the different skin color of people from northern Europe and from Africa.

However, there is no clear scientific consensus on the definition of race, and it is impossible to measure reliably (Yudell et al., 2019). Human genetic variation occurs along a broad continuum, and 90 percent of such variation occurs within rather than among socially defined races (Ossorio & Duster, 2005). In other words, the differences between two people on the opposite ends of a distribution within one race are larger than the differences between two people of different races. Thus, we cannot define race using biological differences. It is not a biological category. However, it is nonetheless important to development because of its role as an important social category.

It is also worth noting that across broad ethnic and racial dimensions, there is still vast diversity within the categories themselves. For example, the term *Hispanics* encompasses a variety of different types of people: Cuban Americans; Central Americans, including Mexicans; South Americans; and those Hispanics who were born in the United States. Moreover, within these

### race

A grouping of humans distinguished by their outward physical characteristics or social qualities from other groups. Not a biological construct.

### ethnic gloss

Overgeneralization about an ethnic or cultural group that obscures differences within the group.



The existence of Marcia and Millie Biggs, who as fraternal twins share approximately 50 percent of their genes, calls into question the concept of race as a biological construct.

Worldwide Features/Barcroft Media/Getty Images

# Window on the world

## THE WORLD WITHIN OUR BORDERS: IMMIGRATION

The United States is often called a nation of immigrants, known for its cultural diversity and appeals to those seeking refuge, freedom, financial security, or a second chance. In 2019, almost 14 percent of the US population were immigrants (Budiman, 2020). Most immigrants are naturalized citizens or lawful permanent residents. However, approximately a quarter of immigrants are unauthorized (Budiman et al., 2020).

In 1910, most US immigrants came from Europe and Canada. By 2010, the largest numbers of immigrants were from Mexico, Asia, and the Caribbean. Since then, the largest percentage increases have occurred in immigration from southern Asia, the Middle East, and northern Africa (Camarota & Zeigler, 2016). Until recently, Mexico accounted for the largest proportion of immigrants; however, China and India are now the top countries of origin for immigrants (Budiman et al., 2020).

One-fourth (25.8 percent) of US children lived in immigrant families in 2019, and 87.9 percent of these children were born in the United States, making them US citizens (Migration Policy Institute, 2020). Immigrant children are the fastest growing group of children in the United States. Approximately 5.2 million children under the age of 18 years—27 percent of children of immigrants and 7 percent of all children—have at least one parent who is undocumented (Capps, et al., 2016).

Poverty is higher in children from immigrant families. In 2019, 45 percent of immigrant children lived in poverty, as compared with 35 percent of all children in the United States (Batalova et al., 2020). Having undocumented parents is an even greater risk; 75 percent of these children live in poverty (Capps et al., 2016). Access to health care is also an issue, and health insurance coverage rates of documented (79 percent) and undocumented (65 percent) immigrant

children still lag behind those of children with nonimmigrant parents (95 percent; Kaiser Family Foundation, 2020). The COVID-19 pandemic is exacerbating these inequities between immigrant and native-born populations. For instance, immigrants, most notably those from Central America, suffered greater job losses during the initial stages of the pandemic (Capps et al., 2020).

Immigrants bring racial, cultural, and ethnic diversity to the country. This allows Americans to experience different ways of life, languages, religions, and foods. Immigrants also bring innovative ideas and economic benefits. One-fourth of all US engineering and technology companies founded between 1995 and 2005 had at least one immigrant founder (Wharton School at the University of Pennsylvania (2016)). More than half of all patent grants in 2014 were to foreign-born individuals (Grenier, 2014). Immigrants often work in farming, food service, maintenance, construction, and manufacturing industries. Many of these industries would collapse without immigrant labor (Jacobi, 2012).

Immigration will continue to bring a depth and richness to the nation and its culture. As immigration adds to the dramatic changes in the US population, developmental issues affecting children in immigrant families will become increasingly important areas of research.



Are you (or any members of your family) immigrants or children of immigrants? If so, what factors helped or hindered your (or their) adjustment to life in the United States? How do you imagine life may be different for children of immigrants 40 years from now?

groupings, individuals may be White, Black, Native American, or of mixed descent.

When a term such as *Hispanics* is used to describe this diverse group as a single entity, this is known as an ethnic gloss. An **ethnic gloss** is an overgeneralization that obscures or blurs such variations.

**The Historical Context** At one time developmentalists paid little attention to the historical context—the time in which people live. However, over time investigators began to focus on how influences tied to time and place affect the course of people's lives.

### checkpoint can you . . .

- Give examples of the influences of family and neighborhood composition, socioeconomic status, culture, and race/ethnicity?



A major normative history-graded influence for today's children is the COVID-19 pandemic.

FG Trade/E+/Getty Images

#### normative

Characteristic of an event that occurs in a similar way for most people in a group.

#### historical generation

A group of people strongly influenced by a major historical event during their formative period.

#### cohort

A group of people born at about the same time.

#### nonnormative

Characteristic of an unusual event that happens to a particular person or a typical event that happens at an unusual time of life.

During the COVID-19 pandemic, about 7 out of 10 American parents reported their children spent more time on electronics than previously, and 39 percent reported becoming less strict about screen time (McClain et al., 2021).



## checkpoint can you . . .

- Give examples of normative age-graded, normative history-graded, and nonnormative influences?

## NORMATIVE AND NONNORMATIVE INFLUENCES

To understand similarities and differences in development, we need to look at two types of **normative** influences: biological or environmental events that affect many or most people in a society in similar ways and events that touch only certain individuals (Baltes & Smith, 2004).

Normative age-graded influences are highly similar for people in a particular age group. The timing of biological events is fairly predictable within a normal range. For example, people don't experience puberty at age 35 or menopause at 12.

Normative history-graded influences are significant events (such as World War II or the COVID-19 pandemic) that shape the behavior and attitudes of a **historical generation**: a group of people who experience the event at a formative time in their lives. For example, the education of approximately 80 percent of the world's children was disrupted during the COVID-19 pandemic when schools

shut down in an attempt to stem the spread of the virus. School shutdowns are likely to result in higher food insecurity (as many children rely on school lunches for nutrition) and greater educational inequality between children of higher and lower socioeconomic status (Van Lancker & Parolin, 2020).

Depending on when and where they live, entire generations may feel the impact of **famines, nuclear explosions, or terrorist attacks**. In Western countries, medical advances as well as improvements in nutrition and sanitation have dramatically reduced infant and child mortality. As children grow up today, they are influenced by computers, digital television, the internet, and other technological developments. Social changes, such as the increase in employed mothers and the increase in single-parent households, have greatly altered family life.

A historical generation is not the same as an age **cohort**, a group of people born at about the same time. A historical generation may contain more than one cohort, but cohorts are part of a historical generation only if they experience major, shaping historical events at a formative point in their lives (Rogler, 2002).

Nonnormative influences are unusual events that have a major impact on individual lives because they disturb the expected sequence of the life cycle. They are either typical events that happen at an atypical time of life (such as the death of a parent when a child is young) or atypical events (such as surviving a plane crash). Some of these influences are largely beyond a person's control and may present rare opportunities or severe challenges that the person perceives as turning points. On the other hand, people sometimes help create their own nonnormative life events—say, by deciding to have a baby in their midfifties or taking up a risky hobby such as skydiving—and thus participate actively in their own development.

Taken together, the three types of influences—normative age-graded, normative history-graded, and nonnormative—contribute to the complexity of human development as well as to the challenges people experience in trying to build their lives.

## TIMING OF INFLUENCES

In a well-known study, Konrad Lorenz (1957), an Austrian zoologist, showed that newly hatched goslings will instinctively follow the first moving object they see, whether it is a member of their species or not. This phenomenon is called **imprinting**. Usually, this automatic and irreversible bond is with the mother. However, when the natural course of events is disturbed, other attachments, such as the ones the goslings made to Lorenz, or none at all can form. Imprinting, said Lorenz, is the result of the readiness of an organism's nervous system to acquire certain information **during a brief critical period in early life**.

A **critical period** is a specific time when a given event, or its absence, has a specific impact on development. If a necessary event does not occur during a critical period of maturation, normal development will not occur, and the resulting abnormal patterns may be irreversible (Kuhl et al., 2005).

Do human beings experience critical periods, as goslings do? One example of a critical period occurs during gestation. If a pregnant person receives X-rays, takes certain drugs, or contracts certain diseases at certain times during pregnancy, the fetus may show specific ill effects, depending on the nature of the insult, its timing, and characteristics of the fetus itself.

However, the concept of critical periods in humans is controversial. Because many aspects of development, even in the physical domain, have been found to show **plasticity**, or modifiability of performance, it may be more useful to think about **sensitive periods**, times when a developing person is especially responsive to certain kinds of experiences (Bruer, 2001).

There are individual differences in plasticity of responses to environmental events. Some children—especially those with difficult temperaments, those who are highly reactive, and those with particular gene variants—may be more profoundly affected by childhood experiences, whether positive or negative, than other children (Belsky & Pluess, 2009). This research suggests that characteristics generally assumed to be negative—such as a difficult or reactive temperament—can be adaptive (positive) when the environment is supportive of development. For example, one study found that children who were highly reactive to environmental events showed, as expected, negative responses such as aggression and behavior problems when faced with stressors such as marital conflict in their families. Surprisingly, however, when the levels of family adversity were low, highly reactive children showed even more adaptive profiles than children low in reactivity. These highly reactive children were more prosocial, more engaged in school, and showed lower levels of externalizing symptoms (Obradovic et al., 2010). Research such as this clearly points to a need to reconceptualize the nature of plasticity in early development with an eye toward examining issues of resilience as well as risk.



Newborn goslings follow and become attached to the first moving object they see, which in this case happened to be ethologist Konrad Lorenz. Lorenz called this behavior imprinting.

Album/Alamy Stock Photo

#### imprinting

Instinctive form of learning in which, during a critical period in early development, a young animal forms an attachment to the first moving object it sees, usually the mother.

#### critical period

Specific time when a given event or its absence has a specific impact on development.

#### plasticity

(1) Range of modifiability of performance. (2) Modifiability, or “molding,” of the brain through experience.

#### sensitive periods

Times in development when a person is particularly open to certain kinds of experiences.

## The Life-Span Developmental Approach

Paul B. Baltes (1936–2006) and his colleagues (Baltes & Smith, 2004) have identified seven key principles of a life-span developmental approach that sum up many of the concepts discussed in this chapter. Together these principles serve as a widely accepted conceptual framework for the study of life-span development:

1. **Development is lifelong.** Development is a lifelong process of change. Each period of the life span is affected by what happened before and will affect what is to come. Each period has unique characteristics and value. No period is more or less important than any other.
2. **Development is multidimensional.** It occurs along multiple interacting dimensions—biological, psychological, and social—each of which may develop at varying rates.
3. **Development is multidirectional.** As people gain in one area, they may lose in another, sometimes at the same time. Children grow mostly in one direction—up—both in size and in abilities. Then the balance gradually shifts. Adolescents typically gain in physical abilities, but their facility in learning a new language

checkpoint  
can you . . .

- Contrast critical and sensitive periods and give examples?

Seeking dangerous activities may be influenced by our genes. Specifically, a mutation in genes that code for dopamine appears to be related to risk-taking behaviors (Derringer et al., 2011).



typically declines. Some abilities, such as vocabulary, often continue to increase throughout most of adulthood; others, such as the ability to solve unfamiliar problems, may diminish; but some new attributes, such as wisdom, may increase with age.

4. ***Relative influences of biology and culture shift over the life span.*** The process of development is influenced by both biology and culture, but the balance between these influences changes. Biological abilities, such as sensory acuity and muscular strength and coordination, weaken with age, but cultural supports, such as education, relationships, and technologically age-friendly environments, may help compensate.
5. ***Development involves changing resource allocations.*** Individuals choose to invest their resources of time, energy, talent, money, and social support in varying ways. Resources may be used for growth (for example, learning to play an instrument or improving one's skill), for maintenance or recovery (practicing to maintain or regain proficiency), or for dealing with loss when maintenance and recovery are not possible. The allocation of resources to these three functions changes throughout life as the total available pool of resources decreases. **In childhood and young adulthood, the bulk of resources typically goes to growth; in old age, to regulation of loss. In midlife, the allocation is more evenly balanced among the three functions.**
6. ***Development shows plasticity.*** Many abilities, such as memory, strength, and endurance, can be improved significantly with training and practice, even late in life. However, even in children, plasticity has limits that depend in part on the various influences on development. One of the tasks of developmental research is to discover to what extent particular kinds of development can be modified at various ages.
7. ***Development is influenced by the historical and cultural context.*** Each person develops within multiple contexts—circumstances or conditions defined in part by maturation and in part by time and place. Human beings not only influence but also are influenced by their historical-cultural context. As we discuss throughout this book, developmental scientists have found significant cohort differences, for example, in **intellectual functioning, in women's midlife emotional development, and in the flexibility of personality in old age.**

## checkpoint can you...

- Summarize the seven principles of the life-span developmental approach?

# summary and key terms

## Human Development: An Evolving Field

- Human development is the scientific study of processes of change and stability.
- Developmental research has important applications in various fields.
- As researchers have become interested in following development through adulthood, life-span development has become a field of study.

- The study of human development seeks to describe, explain, predict, and, when appropriate, intervene in development.
- Students of human development draw on such disciplines as psychology, psychiatry, sociology, anthropology, biology, genetics, family science, education, history, philosophy, and medicine.
- Methods of studying human development are still evolving, making use of advanced technologies.

- Human development is multiply influenced; thus, the field benefits from incorporating diversity into its people, practices, and products, as well as from knowledge drawn from multiple perspectives in the social and biological sciences.

**human development** (3)

**life-span development** (3)

## Basic Concepts in Human Development

- Developmental scientists study change and stability in all domains of development throughout the life span.
- The three major domains of development are physical, cognitive, and psychosocial. Each affects the others.
- The concept of periods of development is a social construction. In this book, the life span is divided into eight periods: prenatal, infancy and toddlerhood, early childhood, middle childhood, adolescence, emerging and young adulthood, middle adulthood, and late adulthood. In each period, people have characteristic developmental needs and tasks.

**physical development** (4)

**cognitive development** (4)

**psychosocial development** (4)

**social construction** (5)

## Influences on Development

- Influences on development come from both heredity and environment. Many typical changes during childhood are related to maturation. Individual differences tend to increase with age.
- In some societies, the nuclear family predominates; in others, the extended family.
- Socioeconomic status (SES) affects developmental processes and outcomes through the quality of home and neighborhood environments, nutrition, medical care, and schooling. Existing disparities were exacerbated by the COVID-19 pandemic.
- Important environmental influences stem from culture, race/ethnicity, and historical context. Race is viewed by most scholars as a social construction.
- Influences may be normative (age-graded or history-graded) or nonnormative.

- There is evidence of critical or sensitive periods for certain kinds of early development.
- individual differences** (8)  
**heredity** (8)  
**environment** (8)  
**maturation** (9)  
**nuclear family** (9)  
**extended family** (9)  
**polygamy** (10)  
**socioeconomic status (SES)** (10)  
**COVID-19** (11)  
**risk factors** (12)  
**culture** (12)  
**individualistic culture** (12)  
**collectivistic culture** (12)  
**ethnic group** (12)  
**ethnic minorities** (12)  
**intersectionality** (13)  
**Black Lives Matter** (13)  
**BIPOC** (13)  
**race** (14)  
**ethnic gloss** (15)  
**normative** (16)  
**historical generation** (16)  
**cohort** (16)  
**nonnormative** (16)  
**imprinting** (16)  
**critical period** (17)  
**plasticity** (17)  
**sensitive periods** (17)

## The Life-Span Developmental Approach

- The principles of the life-span developmental approach include the propositions that (1) development is lifelong, (2) development is multidimensional, (3) development is multidirectional, (4) the relative influences of biology and culture shift over the life span, (5) development involves changing resource allocations, (6) development shows plasticity, and (7) development is influenced by the historical and cultural context.

# chapter 2

# Theory and Research

## outline

Basic Theoretical Issues  
Theoretical Perspectives  
Research Methods  
Research Issues

## learning objectives

Describe the purpose of a theory in research and two theoretical issues on which developmental scientists differ.

Summarize the main theories of human development.

Describe the methods developmental researchers use to collect data and the advantages and disadvantages of each.

Describe current research issues including diversity, the open science movement, and ethical issues.



BSIP/Universal Images Group via Getty Images

## did you know?

- Theories are never “set in stone”; they are always open to change as a result of new findings.
- Cross-cultural research enables us to investigate which aspects of development are universal and which are culturally influenced.
- As the world has become more diverse, the field of psychology has increasingly recognized the contributions of diverse theorists and researchers.

*In this chapter, we present an overview of major theories of human development and of the research methods used to study it as well as current issues in research. Although traditional theorists and researchers brilliantly contributed to our wealth of knowledge, researchers from diverse groups and those investigating issues related to diversity are often not represented. Where possible, we include their contributions here as well.*



**T**he good thing about science is that it's true whether or not you believe in it.

—Neil deGrasse Tyson (b. 1958)

## Basic Theoretical Issues

A scientific **theory** of development is a set of logically related concepts or statements that seek to describe and explain development and to predict the kinds of behavior that might occur under certain conditions. Theories organize and explain data, the information gathered by research. As painstaking research adds, bit by bit, to the body of knowledge, theoretical concepts help us make sense of, and see connections between, isolated pieces of data.

Theory and research are interwoven strands in the seamless fabric of scientific study. Theories inspire further research and predict its results. They do this by generating **hypotheses**, explanations or predictions that can be tested by further research. Research can indicate whether a theory is accurate in its predictions but cannot conclusively show a theory to be true. Sometimes research supports a hypothesis and the theory on which it was based. At other times, scientists must modify their theories to account for unexpected data. The willingness of scientists to reevaluate their beliefs in light of new data is one of science's greatest strengths. Research findings often suggest additional hypotheses to be examined and provide direction for dealing with practical issues. It is the emergence of new data, and our willingness to consider it, that moves us forward.

Theories share some common themes. The way theorists explain development depends in part on their assumptions about two basic issues: (1) whether people are active or reactive in their own development, and (2) whether development is continuous or occurs in stages.

### ISSUE 1: IS DEVELOPMENT ACTIVE OR REACTIVE?

Psychologists who believe in reactive development conceptualize the developing child as a hungry sponge that soaks up experiences and is shaped by this input over time. Psychologists who believe in active development argue that people create experiences for themselves and are motivated to learn about the world around them.

**Mechanistic Model** The philosophical debate over the nature of development eventually led to psychologists to develop two contrasting models, or images, of development: mechanistic and organismic. In the first view, the **mechanistic model**, people are like machines that react to environmental input (Pepper, 1961).

Machines do not operate of their own will; they react automatically to physical forces or inputs. Fill a car with gas, turn the ignition key, press the accelerator, and the car will move. In the mechanistic view, human behavior is much the same: It results from the operation of biological parts in response to external or internal stimuli. If we know enough about how the human "machine" is put together and about the forces acting on it, we can predict what the person will do.

Mechanistic researchers want to identify the factors that make people behave as they do. For example, to explain why some college students drink too much alcohol, a mechanistic theorist might look for environmental influences, such as advertising and whether the student's friends are heavy drinkers.



People generally think theories are less well supported than laws, but in scientific terms, the opposite is true. Laws are observations without explanations. Theories, by contrast, are observations and explanations. So theories have more support, not less. Theories are the backbone of science.

### checkpoint can you . . .

- Explain the relationships among theories, hypotheses, and research?

#### theory

Coherent set of logically related concepts that seeks to organize, explain, and predict data.

#### hypotheses

Possible explanations for phenomena, used to predict the outcome of research.

#### mechanistic model

Model that views human development as a series of predictable responses to stimuli.

These issues are also applicable to the real world. For instance, if you believe in the worth of programs such as Head Start, that implies you believe in the power of environmental influences. If you think such programs are not worth the financial investment, that implies you feel heredity is more important. Do your political beliefs match your implicit beliefs about development?



Quantitative change is like counting apples; there might be fewer or more apples, but they're still all apples. Qualitative change is like comparing apples to oranges. You're counting completely different things.



#### organismic model

Model that views human development as internally initiated by an active organism and as occurring in a sequence of qualitatively different stages.

#### quantitative change

Change in number or amount, such as in height, weight, size of vocabulary, or frequency of communication.

#### qualitative change

Discontinuous change in kind, structure, or organization.

### FIGURE 1

#### Quantitative and Qualitative Change

A major difference among developmental theories is (a) whether development proceeds continuously, as learning theorists and information-processing theorists propose, or (b) whether it occurs in distinct stages, as Freud, Erikson, and Piaget maintained.

**Organismic Model** The organicist model sees people as active, growing organisms who set their own development in motion (Pepper, 1961). They initiate events; they do not just react. Thus, the driving force for change is internal. Environmental influences do not cause development, though they can speed or slow it.

Because human behavior is viewed as an organic whole, it cannot be predicted by breaking it down into simple responses to environmental stimulation. An organicist theorist, in studying why some students drink too much, looks at what kinds of situations they choose to participate in and with whom. Do they choose friends who prefer to party or to study?

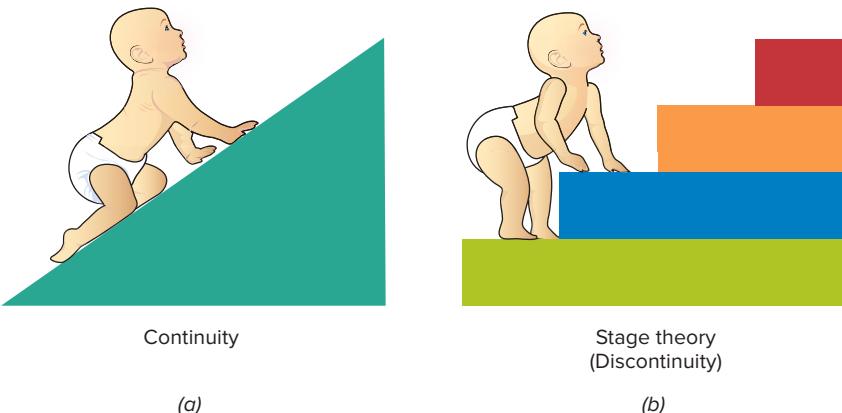
For organicists, development has an underlying, orderly structure, though it may not be obvious from moment to moment. As a fertilized egg cell develops into an embryo and then into a fetus, it goes through a series of changes not overtly predictable from what came before. Swellings on the head become eyes, ears, mouth, and nose. The brain begins to coordinate breathing, digestion, and elimination. Sex organs form. Similarly, organicists describe development after birth as a progressive sequence of stages, moving toward full maturation.

### ISSUE 2: IS DEVELOPMENT CONTINUOUS OR DISCONTINUOUS?

The mechanistic and organicist models also differ on the second issue: Is development continuous, that is, gradual and incremental, or discontinuous, that is, abrupt or uneven? Mechanist theorists see development as continuous: as occurring in small incremental stages (Figure 1a). Development is always governed by the same processes and involves the gradual refinement and extension of early skills into later abilities, allowing one to make predictions about future characteristics on the basis of past performance. This type of change is known as quantitative change—a change in number or amount, such as height, weight, or vocabulary size.

Qualitative change, by contrast, is discontinuous and marked by the emergence of new phenomena that could not be easily predicted on the basis of past functioning. Development at different points in the life span is, in this view, fundamentally different in nature. It is a change in kind, structure, or organization, not just in number.

As an example of the difference between quantitative and qualitative change, take pregnancy. Being 2 months pregnant versus being 6 months pregnant is a quantitative change: It involves being more or less pregnant. However, not being pregnant in comparison to being pregnant is a qualitative change. You can't be a little bit pregnant: You either are or you are not. It is fundamentally a different state, not just a different level of the same state.



Organismic theorists are proponents of stage theories in which development is seen as occurring in a series of distinct stages, like stairsteps (Figure 1b). At each stage, what is going on is fundamentally different from previous stages. Moreover, stages build upon each other. Stages cannot be skipped, and development only proceeds in a positive direction. It is believed that these processes are universal and account for the development of all humans everywhere, although the particular timing may vary a bit.

# Theoretical Perspectives

Five major perspectives underlie much influential theory and research on human development: (1) psychoanalytic, which focuses on unconscious emotions and drives; (2) learning, which studies observable behavior; (3) cognitive, which analyzes thought processes; (4) contextual, which emphasizes the impact of the historical, social, and cultural context; and (5) evolutionary/sociobiological, which considers evolutionary and biological underpinnings of behavior. Following is a general overview of each of these perspectives and some leading theorists. These are summarized in Table 1.

## PERSPECTIVE 1: PSYCHOANALYTIC

Sigmund Freud (1856–1939) was a Viennese physician and the originator of the **psychoanalytic perspective**. He believed in reactive development, as well as qualitative changes over time.

**Psychosexual Development** Freud (1920) believed that people are born with biological drives that must be redirected to make it possible to live in society. He proposed three hypothetical parts of the personality: the id, the ego, and the superego. Newborns are governed by the id, which operates under the pleasure principle—the drive to seek immediate satisfaction of their needs and desires. When gratification is delayed, as it is when infants have to wait to be fed, they begin to see themselves as separate from the outside world. The ego, which represents reason, develops gradually during the first year or so of life and operates under the reality principle. The ego's aim is to find realistic ways to gratify the id that are acceptable to the superego, which develops at about age 5 or 6. The superego includes the conscience and incorporates socially approved "shoulds" and "should nots" into the child's value system. The superego is highly demanding; if its standards are not met, a child may feel guilty and anxious. The ego mediates between the impulses of the id and the demands of the superego.

Freud proposed that personality forms through unconscious childhood conflicts between the inborn urges of the id and the requirements of civilized life. These conflicts occur in a sequence of five stages of **psychosexual development** (Table 2), in which sensual pleasure shifts from one body zone to another—from the mouth to the anus and then to the genitals. At each stage, the behavior that is the chief source of gratification (or frustration) changes—from feeding to elimination and eventually to sexual activity.

Freud considered the first three stages to be crucial for personality development. According to Freud, if children receive too little or too much gratification in any of these stages, they are at risk of fixation, an arrest in development that can show up in adult personality. Babies whose needs are not met during the oral stage, when feeding is the main source of pleasure, may grow up to become nail-biters or smokers. A person who, as a toddler, had too-strict toilet training may be fixated at the anal stage and be obsessively clean, rigidly tied to schedules and routines, or defiantly messy.

According to Freud, a key event in psychosexual development occurs in the phallic stage of early childhood. Boys develop sexual attachment to their mothers and girls to their fathers, and they have aggressive urges toward the same-sex parent, whom they regard as a rival. Freud called these developments the Oedipus and Electra complexes.

Children eventually resolve their anxiety over these feelings by identifying with the same-sex parent and move into the latency stage of middle childhood, a period of relative

- Discuss two issues regarding human development?
- Contrast the mechanistic and organismic models?
- Compare quantitative and qualitative change?

### psychoanalytic perspective

View of human development as shaped by unconscious forces that motivate human behavior.

### psychosexual development

In Freudian theory, an unvarying sequence of stages of childhood personality development in which gratification shifts from the mouth to the anus and then to the genitals.



In 1933, Inez Prosser became the first African American woman to earn her PhD. Her research focused on the adjustment of African American students in segregated and desegregated schools.



Sigmund Freud developed a theory of psychosexual development. His daughter, Anna, shown here, followed in his footsteps and constructed her own theories of personality development.

Imago/Hulton Archive/Getty Images

**TABLE 1** Five Perspectives on Human Development

Perspective	Important Theories	Basic Propositions	Stage-Oriented	Causal Emphasis	Active/Reactive Individual
<b>Psychoanalytic</b>	Freud's psychosexual theory	Behavior is controlled by powerful unconscious urges.	Yes	Innate factors modified by experience	Reactive
	Erikson's psychosocial theory	Personality is influenced by society and develops through a series of crises.	Yes	Interaction of innate and experiential factors	Active
<b>Learning</b>	Behaviorism, or traditional learning theory (Pavlov, Skinner, Watson)	People are responders; the environment controls behavior.	No	Experience	Reactive
	Social learning (social cognitive) theory (Bandura)	Children learn in a social context by observing and imitating models; they are active learners.	No	Experience modified by innate factors	Active and reactive
<b>Cognitive</b>	Piaget's cognitive-stage theory	Qualitative changes in thought occur with development. Children are active initiators of development.	Yes	Interaction of innate and experiential factors	Active
	Vygotsky's sociocultural theory	Social interaction is central to cognitive development.	Yes (for concept formation)	Experience	Active
	Information-processing theory	Human beings are processors of symbols.	No	Interaction of innate and experiential factors	
<b>Contextual</b>	Bronfenbrenner's bioecological theory	Development occurs through interaction between a developing person and five surrounding, interlocking contextual systems of influences.	No	Interaction of innate and experiential factors	Active
<b>Evolutionary/sociobiological</b>	Evolutionary psychology; Bowlby's attachment theory	Human beings are the product of adaptive processes, which interact with the current environment to shape behavior.	No	Interaction of innate and experiential factors	Active and reactive (theorists vary)

emotional calm and intellectual and social exploration. They redirect their sexual energies into other pursuits, such as schoolwork, relationships, and hobbies.

The genital stage, the final stage, lasts throughout adulthood. The sexual urges repressed during latency now resurface to flow in socially approved channels, which Freud defined as heterosexual relations with persons outside the family of origin.

**TABLE 2** Developmental Stages According to Various Theories

Psychosexual Stages (Freud)	Psychosocial Stages (Erikson)	Cognitive Stages (Piaget)
<i>Oral (birth to 12–18 months).</i> Baby's chief source of pleasure involves mouth-oriented activities (sucking and feeding).	<i>Basic trust versus mistrust (birth to 12–18 months).</i> Baby develops sense of whether world is a good and safe place. Virtue: hope.	<i>Sensorimotor (birth to 2 years).</i> Infant gradually becomes able to organize activities in relation to the environment through sensory and motor activity.
<i>Anal (12–18 months to 3 years).</i> Child derives sensual gratification from withholding and expelling feces. Zone of gratification is anal region, and toilet training is important activity.	<i>Autonomy versus shame and doubt (12–18 months to 3 years).</i> Child develops a balance of independence and self-sufficiency over shame and doubt. Virtue: will.	<i>Preoperational (2 to 7 years).</i> Child develops a representational system and uses symbols to represent people, places, and events. Language and imaginative play are important manifestations of this stage. Thinking is still not logical.
<i>Phallic (3 to 6 years).</i> Child becomes attached to parent of the other sex and later identifies with same-sex parent. Superego develops. Zone of gratification shifts to genital region.	<i>Initiative versus guilt (3 to 6 years).</i> Child develops initiative when trying new activities and is not overwhelmed by guilt. Virtue: purpose.	
<i>Latency (6 years to puberty).</i> Time of relative calm between more turbulent stages.	<i>Industry versus inferiority (6 years to puberty).</i> Child must learn skills of the culture or face feelings of incompetence. Virtue: skill.	<i>Concrete operations (7 to 11 years).</i> Child can solve problems logically if they are focused on the here and now but cannot think abstractly.
<i>Genital (puberty through adulthood).</i> Reemergence of sexual impulses of phallic stage, channeled into mature adult sexuality.	<i>Identity versus identity confusion (puberty to young adulthood).</i> Adolescent must determine own sense of self ("Who am I?") or experience confusion about roles. Virtue: fidelity.  <i>Intimacy versus isolation (young adulthood).</i> Person seeks to make commitments to others; if unsuccessful, may suffer from isolation and self-absorption. Virtue: love.  <i>Generativity versus stagnation (middle adulthood).</i> Mature adult is concerned with establishing and guiding the next generation or else feels personal impoverishment. Virtue: care.  <i>Integrity versus despair (late adulthood).</i> Older adult achieves acceptance of own life, allowing acceptance of death, or else despairs over inability to relive life. Virtue: wisdom.	<i>Formal operations (11 years through adulthood).</i> Person can think abstractly, deal with hypothetical situations, and think about possibilities.

Note: All ages are approximate.

Freud's theory made historic contributions and inspired a whole generation of followers, some of whom took psychoanalytic theory in new directions. However, many of Freud's ideas now are widely considered culturally biased or obsolete or are impossible to investigate scientifically. Psychoanalysts today reject his narrow emphasis on sexual and aggressive drives to the exclusion of other motives.

Nevertheless, several of his central themes have stood the test of time. Freud made us aware of the importance of unconscious thoughts, feelings, and motivations; the role of childhood experiences in forming personality; the ambivalence of emotional responses; the role of mental representations of the self and others in the establishment of intimate relationships; and the path of normal development from an immature, dependent state to a mature, interdependent state.

### checkpoint can you . . .

- Identify the chief focus of the psychoanalytic perspective?
- Name Freud's five stages of development and three parts of the personality?



The psychoanalyst Erik H. Erikson emphasized societal influences on personality, lifespan development, and the possibility of positive change.

Bettmann/Getty Images

#### psychosocial development

(1) Pattern of change in emotions, personality, and social relationships. (2) In Erikson's eight-stage theory, the socially and culturally influenced process of development of the ego, or self.

#### checkpoint can you... ?

- Describe what a psychosocial crisis is and when it occurs?
- Tell two ways that Erikson's theory differs from Freud's?

#### learning perspective

View of human development that holds that changes in behavior result from experience or from adaptation to the environment.

#### behaviorism

Learning theory that emphasizes the predictable role of environment in causing observable behavior.

**Psychosocial Development** Erik Erikson (1902–1994) modified and extended Freudian theory by emphasizing the influence of society on the developing personality. Erikson also was a pioneer in taking a life-span perspective. Note that both theorists, as they proposed stage theories, believed in qualitative change.

Erikson's (1950) theory of **psychosocial development** covers eight stages across the life span (refer to Table 2), which we discuss in the appropriate chapters throughout this book. Each stage involves what Erikson originally called a **crisis in personality**\*—a major psychosocial challenge that is particularly important at that time. These issues must be satisfactorily resolved for healthy ego development.

Each stage requires the balancing of a positive trait and a corresponding negative one. The positive quality should dominate, but some degree of the negative quality is needed as well for optimal development. The critical theme of infancy, for example, is basic trust versus basic mistrust. People need to trust the world and the people in it. However, they also need some mistrust to protect themselves from danger. The successful outcome of each stage is the development of a particular virtue, or strength; in this case, the virtue of hope.

Successful resolution of each crisis puts the person in a particularly good position to address the next crisis, a process that occurs iteratively across the life span. So, for example, a child who successfully develops a sense of trust in infancy would be well prepared for the development of a sense of autonomy—the second psychosocial challenge—in toddlerhood. After all, if you feel that others have your back, you are likely to try new things and thus develop new skills. By contrast, if you feel alone and uncertain, you can still develop autonomy, but it is more difficult. Ideally, each stage builds on the preceding one.

Erikson's theory is important for a number of reasons. First, while the crises that Erikson outlined were particular to one place and time, Erikson did make clear that social and cultural influences mattered. Erikson highlighted the social clock—the conventional, culturally preferred timing of important life events. Moreover, while Freud's approach implied that development stopped at adolescence, Erikson realized that development was a lifelong process. Last, Erikson held a much more positive view of development than Freud. Erikson, while acknowledging that crises could be resolved poorly, left room for improvement. At any point in the life span, development could shift in a positive direction, and a crisis might be successfully resolved and a new strength developed.

## PERSPECTIVE 2: LEARNING

Theorists within the **learning perspective** argued that development was the result of learning, a relatively long-lasting change based on experience or adaptation to the environment. Learning theorists were not interested in the inner working of the mind because those processes could not be directly observed. Because behavior is observable and countable and confers more objectivity, this was the focus. In the opinion of proponents of this view, terms could be defined precisely and theories could be tested scientifically in the laboratory, thus lending psychology greater legitimacy and respectability.

Psychologists at the time also viewed the mind as *tabula rasa*, a blank slate upon which experience could write. In this view, everything a person became depended upon experience. Thus, anyone, no matter what race or whatever individual characteristics might be present, could do or be anything. This implied cultural and contextual influences were primary in importance in shaping differences between people. The belief that all people were fundamentally the same held a powerful attraction.

Behaviorists saw development as continuous, emphasizing incremental quantitative changes over time, and reactive, occurring in response to environmental input. The learning approach was the dominant ideology in the field of psychology in the 1950s. Two of the major subtheories were behaviorism and the social learning approach.

**Behaviorism** Behaviorism is a mechanistic theory that describes observed behavior as a predictable response to experience. Behaviorists consider development as reactive and

\*Erikson broadened the concept of “crisis” and later referred instead to conflicting or competing tendencies.

continuous. They hold that human beings at all ages learn about the world the same way other organisms do; by reacting to conditions or aspects of their environment that they find pleasing, painful, or threatening. Behavioral research focuses on associative learning, in which a mental link is formed between two events. Two kinds of associative learning are classical conditioning and operant conditioning.

**Classical Conditioning** Ivan Pavlov (1849–1936) was a Russian physiologist studying the role of saliva in dogs' digestive processes. In order to collect saliva from the dogs, Pavlov would secure them with a harness to prevent them from lowering their head, place a saliva collection device on their throat, and then place a bowl of meat underneath the dog. While conducting this research, Pavlov realized that the dogs, shortly after being introduced to the methodology, would salivate before the presentation of the meat. Once he realized this was occurring, he investigated this process, using a "bell" (in actuality, a metronome) as a predictor for the meat. This was the foundation for **classical conditioning**, a type of learning in which a response (salivation) to a stimulus (a bell) is elicited after repeated association with a stimulus that normally elicits the response (food).

The American behaviorist John B. Watson (1878–1958) applied such stimulus-response theories to children, claiming that he could mold any infant in any way he chose. In one of the earliest and most famous demonstrations of classical conditioning in human beings (Watson & Rayner, 1920), he taught an 11-month-old baby known as "Little Albert" to fear furry, white objects.

In this study, Albert was exposed to a loud noise when he started to stroke a rat. The noise frightened him, and he began to cry. After repeated pairings of the rat with the loud noise, Albert whimpered with fear when he saw the rat. Albert also started showing fear responses to white rabbits and cats, and the beards of elderly men. The study, although unethical, demonstrated that fear could be conditioned.

**Operant Conditioning** Kasem lies in his crib. When he starts to babble ("ma-ma-ma"), his mother smiles and repeats the syllables. Kasem learns that his behavior (babbling) can produce a desirable consequence (loving attention from a parent), and so he keeps babbling to attract his mother's attention. An originally accidental behavior (babbling) has become a conditioned response.

This type of learning is called **operant conditioning** because the individual learns from the consequences of "operating" on the environment. Unlike classical conditioning, operant conditioning involves voluntary behavior, such as Kasem's babbling, and involves the consequences rather than the predictors of behavior.

The American psychologist B. F. Skinner (1904–1990) argued that an organism—animal or human—will tend to repeat a response that has been reinforced by desirable consequences and will suppress a response that has been punished. Thus, **reinforcement** is the process by which a behavior is strengthened, increasing the likelihood that the behavior will be repeated. In Kasem's case, his mother's attention reinforces his babbling. **Punishment** is the process by which a behavior is weakened, decreasing the likelihood of repetition. If Kasem's mother frowned when he babbled, he would be less likely to babble again.

Reinforcement and punishment can be positive, involving "adding" a stimulus to the environment, or negative, involving the "subtraction" or removal of a stimulus from the environment. For example, positive reinforcement is provided by Kasem's mother's smiles and encouragement, and because this is reinforcing, it increases the likelihood that Kasem will perform this action again. Negative reinforcement (commonly confused with punishment) should likewise result in a greater likelihood of a behavior occurring, but it should do so by removing a negative stimulus. A good example of this can be found in seatbelt alerts in cars. When the ignition key is turned and the seatbelt is not attached, an irritating buzzer sounds. The buzzer shuts off immediately when the seatbelt is clicked close. The cessation of the sound (the removal of an unpleasant stimulus) is

#### classical conditioning

Learning based on associating a stimulus that does not ordinarily elicit a response with another stimulus that does elicit the response.

#### operant conditioning

(1) Learning based on association of behavior with its consequences. (2) Learning based on reinforcement or punishment.

#### reinforcement

The process by which a behavior is strengthened, increasing the likelihood that the behavior will be repeated.

#### punishment

The process by which a behavior is weakened, decreasing the likelihood of repetition.



You can think of classical conditioning as the before—what happens to provoke a response, and operant conditioning as the after—what happens after a response occurs that shapes the likelihood of it happening again.

#### **social learning theory**

Theory that behaviors are learned by observing and imitating models. Also called *social cognitive theory*.

#### **reciprocal determinism**

Bandura's term for bidirectional forces that affect development.

#### **observational learning**

Learning through watching the behavior of others.

#### **self-efficacy**

Sense of one's capability to master challenges and achieve goals.

#### **cognitive perspective**

View that thought processes are central to development.

#### **cognitive-stage theory**

Piaget's theory that children's cognitive development advances in a series of four stages involving qualitatively distinct types of mental operations.



According to social learning theory, children learn in part by imitating the behavior of others around them.

LightField Studios/Shutterstock

### checkpoint can you... ?

- Identify the chief concerns of the learning perspective?
- Tell how classical conditioning and operant conditioning differ?
- Contrast reinforcement and punishment?
- Compare behaviorism and social learning theory?

reinforcing (should result in a greater likelihood of the seatbelt being buckled the next time a person drives).

The same process can be applied to punishment. An example of positive punishment is speaking sharply to a dog that got into the garbage. This negative experience should result in a reduction of the likelihood of the dog misbehaving again. Punishment can also be negative. If two siblings are fighting over what to watch on television and a parent decides to turn the television off, the children have experienced negative punishment. The removal of a positive stimulus (the television) should result in a reduced likelihood of fighting over the television again.

Reinforcement is most effective when it immediately follows a behavior. If a response is no longer reinforced, it will eventually be extinguished, that is, return to its original (baseline) level. If, after a while, no one repeats Kasem's babbling, he may babble less often than if his babbles still brought reinforcement.

For many years, the bulk of work in psychology occurred within this approach. Behavioral modification, a form of operant conditioning used to shape behaviors, has been widely used as a therapeutic approach for children with special needs. It has been extraordinarily effective in managing problem behaviors and encouraging desired behaviors, although not without controversy.

However, as an overarching theory of development, behaviorism falls short. While learning theorists advocated a *tabula rasa* approach, we know now that children come into the world with a host of individual differences that profoundly impact development. There is no room for such variability within the learning approach. Moreover, it has become clear that the "rules" for learning in different domains do not always follow behavioral predictions and can differ depending on what is being learned.

For example, children learn language far more rapidly than learned associations can account for, and the way in which children learn to talk is fundamentally different from how they learn to walk. Last, psychologists have realized, over time, that while we cannot directly access what is going on in people's heads, we can use indirect measures (such as reaction time) to make objective scientific predictions and collect empirical data. Thus, the earlier reluctance to examine mental processes has abated as the field has progressed.

**Social Learning Theory** The psychologist Albert Bandura (1925–2021) developed many of the principles of **social learning theory**. Whereas behaviorists see the environment as the chief impetus for development, Bandura (1989) suggested the impetus for development is bidirectional. Bandura called this concept **reciprocal determinism**: The person acts on the world as the world acts on the person.

Classic social learning theory maintains that people learn appropriate social behavior chiefly by observing and imitating models; that is, by watching other people. This process is called **observational learning**, or modeling. For example, Clara sees her sister get disciplined for eating a cookie cooling on the counter and thus restrains herself from doing the same thing without herself getting punished.

Bandura's updated version of social learning theory is social cognitive theory. The change of name reflects a greater emphasis on cognitive processes as central to development. Cognitive processes are at work as people observe models, learn chunks of behavior, and mentally put the chunks together into complex new behavior patterns. Rita, for example, imitates the toes-out walk of her dance teacher but models her dance steps after those of Lucy, a slightly more advanced student. Even so, she develops her own style of dancing by putting her observations together into a new pattern. Through feedback on their behavior, children gradually form standards for judging their actions and become more selective in choosing models who demonstrate those standards. They also begin to develop a sense of **self-efficacy**, or confidence in their abilities.

## PERSPECTIVE 3: COGNITIVE

In the following section, we discuss three theoretical traditions within the **cognitive perspective**: Piaget's theory of cognitive development, Vygotsky's sociocultural theory of cognitive development, and the information-processing approach.

**Piagetian Approach** Jean Piaget (1896–1980) developed the **cognitive-stage theory** that reintroduced the concept of scientific inquiry into mental states. Piaget viewed development organismically, as the product of children's attempts to understand and act upon their world. He also believed in **qualitative development**, and thus, his theory delineates a series of stages characterizing development at different ages.

Piaget suggested that cognitive development begins with an **inborn ability to adapt to the environment**. By rooting for a nipple, feeling a pebble, or exploring the boundaries of a room, young children develop a more accurate picture of their surroundings and greater competence in dealing with them. This cognitive growth occurs through three interrelated processes: organization, adaptation, and equilibration.

**Organization** is the tendency to create categories, such as birds, by observing the characteristics that individual members of a category, such as sparrows and cardinals, have in common. According to Piaget, people create increasingly complex cognitive structures called **schemes**, ways of organizing information about the world. These schemes can be either motor or mental in nature. Take sucking, for example. A newborn infant has a simple scheme for sucking but soon develops varied schemes for how to suck at the breast, a bottle, or a thumb. The infant may have to open their mouth wider or turn their head to the side or suck with varying strength.

**Adaptation** is Piaget's term for how children handle new information in light of what they already know. Adaptation occurs through two complementary processes: (1) **assimilation**, taking in new information and incorporating it into existing cognitive structures, and (2) **accommodation**, adjusting one's cognitive structures to fit the new information.

**Equilibration**—a constant striving for a stable balance—motivates the shift between assimilation and accommodation. For example, Anaya knows what birds are and sees a plane for the first time. She labels the plane a “bird” (assimilation). Over time Anaya starts to notice differences between planes and birds. For example, she might notice that although both planes and birds fly, birds have feathers, while planes are made of something hard and smooth, and that birds have eyes and planes do not. These observations bring about an uneasy motivational state known as disequilibrium. Anaya is then motivated to change her understanding to more closely reflect her observations—perhaps by learning the label for plane and realizing that planes and birds are not, after all, the same thing. In other words, accommodation has occurred, and Anaya is now at equilibrium. Throughout life, the quest for equilibrium is the driving force behind cognitive growth.

Piaget described cognitive development as occurring in four universal, qualitatively different stages (listed in Table 2). From infancy through adolescence, mental operations evolve from learning based on simple sensory and motor activity to logical, abstract thought.

Piaget's observations have yielded much information and some surprising insights. Piaget has shown us that children's minds are not miniature adult minds. His theory provided rough benchmarks for what to expect of children at various ages and has helped educators design curricula appropriate to varying levels of development.



Jean Piaget studied children's cognitive development by observing and talking with them in many settings, asking questions to find out how their minds worked.

Bill Anderson/Science Source

### organization

(1) Piaget's term for the creation of categories or systems of knowledge. (2) Mnemonic strategy of categorizing material to be remembered.

### schemes

Piaget's term for organized patterns of thought and behavior used in particular situations.

### adaptation

Piaget's term for adjustment to new information about the environment, achieved through processes of assimilation and accommodation.

### assimilation

Piaget's term for incorporation of new information into an existing cognitive structure.

### accommodation

Piaget's term for changes in a cognitive structure to include new information.

### equilibration

Piaget's term for the tendency to seek a stable balance among cognitive elements; achieved through a balance between assimilation and accommodation.



What we think can influence how we feel. People who think leisure time is wasteful and unproductive enjoy their time off less than people who value leisure time (Tonietto et al., 2021).

### checkpoint

can you . . .

- List three interrelated principles that bring about cognitive growth, according to Piaget, and give an example of each?



According to Lev Vygotsky, children learn through social interaction.

Sovfoto/Universal Images Group/Getty Images

#### sociocultural theory

Vygotsky's theory of how contextual factors affect children's development.

#### zone of proximal development (ZPD)

Vygotsky's term for the difference between what a child can do alone and what the child can do with help.

#### scaffolding

Temporary support to help a child master a task.

Vygotsky believed that play often occurs in the ZPD, pushing children's abilities to their limit. For example, if you ask a child to pretend to be a statue, that child is likely to be able to remain motionless for longer than if you just ask the child not to move. The child knows the "rules" of pretending to be a statue, and those rules provide scaffolding.

#### information-processing approach

(1) Approach to the study of cognitive development by observing and analyzing the mental processes involved in perceiving and handling information. (2) Approach to the study of cognitive development that analyzes processes involved in perceiving and handling information.

Yet Piaget seems to have seriously underestimated the abilities of infants and children. Further, cross-cultural research indicates that performance on formal reasoning tasks is as much a function of culture as it is of development; people from industrialized societies who have participated in a formal educational system show better performance on those tasks (Buck-Morss, 1975). Last, research on adults suggests that Piaget's focus on formal logic as the climax of cognitive development is too narrow. It does not account for the emergence of such mature abilities as practical problem solving, wisdom, and the capacity to deal with ambiguous situations.

**Sociocultural Theory** The Russian psychologist Lev Semenovich Vygotsky (1896–1934) focused on the social and cultural processes that guide children's cognitive development in his **sociocultural theory**. Whereas previous theorists viewed development as a primarily individual process, Vygotsky believed children learn collaboratively through social interaction and shared activities. Rather than believing in universal aspects of development, Vygotsky believed there are as many ways to develop as there are different cultures and different experiences. While psychology as a field has increasingly incorporated issues of diversity into theory and research, Vygotsky's realization that culture was profoundly important to development was far ahead of his time and remains a fundamental and important contribution of his approach.

According to Vygotsky, adults or more advanced peers must help direct and organize a child's learning. This guidance is most effective in helping children cross the **zone of proximal development (ZPD)**, the gap between what they are already able to do by themselves and what they can accomplish with assistance. Sensitive and effective instruction, then, should be aimed at the ZPD and increase in complexity as the child's abilities improve. Responsibility for directing learning gradually shifts to the child, such as when an adult teaches a child to float: The adult first supports the child in the water and then lets go gradually as the child's body relaxes into a horizontal position.

The supportive assistance with a task that parents, teachers, or others give a child is known as **scaffolding**. For example, Noah receives a new puzzle for his birthday, but after emptying the pieces on the dining room table and trying to fit them together, he makes little progress. His older sister sees him trying, sits next to him, and offers advice on how to begin. "Try putting all the pieces of the same color in piles," she says. "That makes it easier to see what goes together. You can look at the box for clues. And if you do the edges first, then you have the outline already done." With his sister's scaffolding, Noah is able to start working on the puzzle. He can move to the high end of his zone of proximal development and maximize his learning.

Vygotsky's ideas have grown in stature and prominence as their implications for education and cognitive testing have become more apparent. For example, most intelligence tests assess what a child has already learned. By contrast, an intelligence test in the Vygotskian tradition might allow testers to offer hints to children who were having trouble answering a question, thereby focusing on that child's potential learning. Additionally, Vygotsky's ideas have had an enormous impact on early childhood education, and they show great promise for promoting the development of self-regulation, which later affects academic achievement (Barnett et al., 2008).

**The Information-Processing Approach** The information-processing approach seeks to explain cognitive development by analyzing the processes involved in making sense of incoming information and performing tasks effectively. For example, theorists within this tradition focus on processes such as attention, memory, planning strategies, decision errors, decision-making, and goal setting. The information-processing approach is not a single theory but a framework that supports a wide range of theories and research.

Some information-processing theorists compare the brain to a computer: There are certain inputs (such as sensory impressions) and certain outputs (such as behaviors). Information-processing theorists are interested in what happens in the middle. Why does the same input sometimes result in different outputs? In large part, information-processing researchers use observational data to infer what goes on between a stimulus and a

response. For example, they may ask a person to recall a list of words and then observe any difference in performance if the person repeats the list over and over before being asked to recall the words or is kept from doing so. Through such studies, some information-processing researchers have developed computational models or flowcharts that analyze the specific steps people go through in gathering, storing, retrieving, and using information.

Information-processing theorists view development as continuous. They note age-related increases in the speed, complexity, and efficiency of mental processing and in the variety of material that can be stored in memory. However, they do not consider those processes to be fundamentally different at different ages, just more sophisticated.

The information-processing approach has practical applications. By assessing certain aspects of infant information processing, researchers are able to estimate an infant's later intelligence. It enables parents and teachers to help children learn by making them more aware of their mental processes and of strategies to enhance them. Psychologists often use information-processing models to test, diagnose, and treat learning problems.

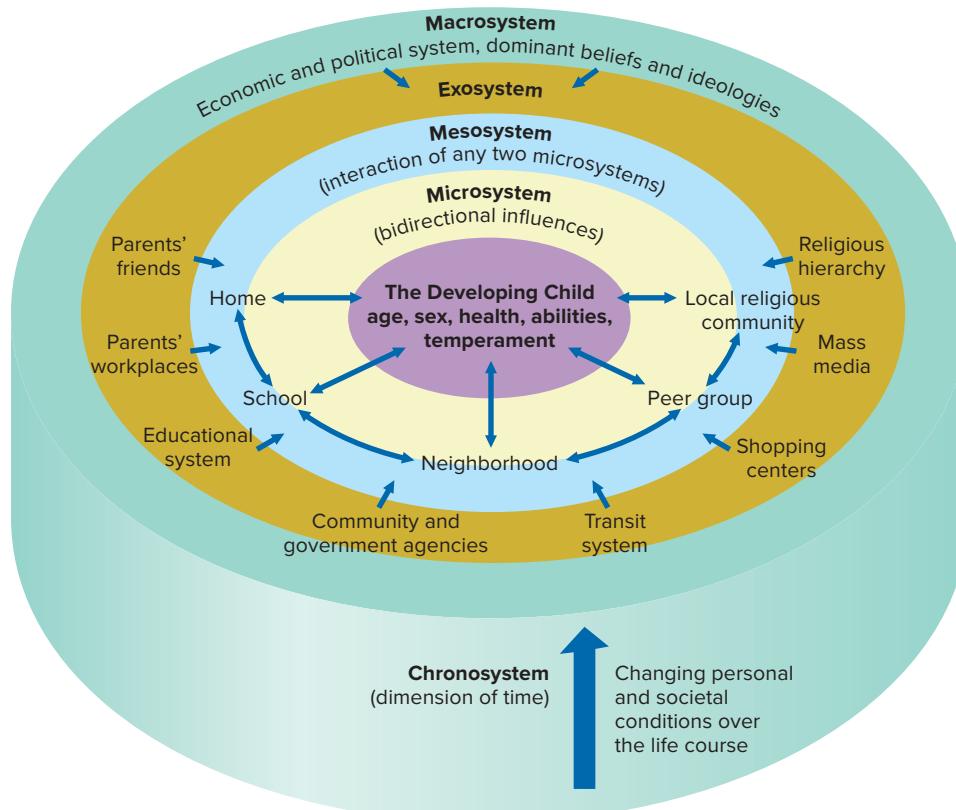
## checkpoint can you . . .

- Explain how Vygotsky's theory differs from Piaget's and how it applies to educational teaching and testing?
- Describe what information-processing researchers do?

## PERSPECTIVE 4: CONTEXTUAL

According to the **contextual perspective**, development can be understood only in its social context. Contextualists see the individual not as a separate entity interacting with the environment but as an inseparable part of it. Vygotsky's sociocultural theory, which we discussed as part of the cognitive perspective, also can be classified as contextual.

The **bioecological theory** of American psychologist Urie Bronfenbrenner (1917–2005) (1979) is generally represented as a set of rings with the developing child in the middle (Figure 2). Here, individual difference variables such as age, sex, health, abilities, or temperament are present. The child is not seen as just an outcome of development; the child is an active shaper of development. But the child does not exist in isolation. To understand development, we must see the child within the context of the multiple environments surrounding them.



**FIGURE 2**  
Bronfenbrenner's  
Bioecological Theory

Concentric circles show five levels of environmental influence on the individual, from the most intimate environment (the microsystem) to the broadest (the chronosystem), the perpendicular dimension of time.

The *microsystem* consists of the everyday environment of home, work, school, or neighborhood. It includes face-to-face interactions with siblings, parents, friends, classmates, or later in life, spouses, work colleagues, or employers.

The *mesosystem* is the interlocking influence of microsystems. For example, a parent's bad day at work may affect interactions with a child later that evening in a negative way. Despite never having actually gone to the workplace, a child is still affected by it.

The *exosystem* consists of interactions between a microsystem and an outside system or institution. For example, countries differ with respect to what type of parental leave, if any, is available. Whether or not a parent can stay home with a newborn is a substantial influence on development. Thus, government policies trickle down and can affect a child's day-to-day experiences.

The *macrosystem* consists of overarching cultural patterns, such as dominant beliefs, ideologies, and economic and political systems. For example, individuals are affected by the type of political system they live in, and they might reasonably have different experiences if raised in an open democratic society versus an authoritarian regime with limited freedoms.

Last, the *chronosystem* represents the dimension of time. Time marches on, and as it does, changes occur. These can include changes in family composition (as when a new child is born or a divorce occurs), place of residence, or parents' employment, as well as larger events such as wars, ideological shifts, or economic cycles.

By looking at systems that affect individuals in and beyond the family, this bioecological approach helps us to see the variety of influences on development. The contextual perspective also reminds us that findings about the development of people in one culture or in one group within a culture (such as White, middle-class Americans) may not apply equally to people in other societies or cultural groups.

## checkpoint can you...

- State the chief assumptions of the contextual perspective?
- Differentiate Bronfenbrenner's five levels of contextual influence?

### evolutionary/sociobiological perspective

View of human development that focuses on evolutionary and biological bases of behavior.

## PERSPECTIVE 5: EVOLUTIONARY/SOCIOBIOLOGICAL

The *evolutionary/sociobiological perspective* focuses on evolutionary and biological bases of behavior. Influenced by Darwin's theory of evolution, it draws on findings of anthropology, ecology, genetics, ethology, and evolutionary psychology to explain the adaptive, or survival, value of behavior for an individual or species.

Darwin's theory of natural selection is one of the most important theoretical advances of modern science. It is elegant in its simplicity and profound in its implications. It is the cornerstone of the biological sciences and has many implications for human psychology.

Fundamentally, Darwin's theory can be broken down into a few major postulates. First, organisms vary. Second, there are never enough resources for all organisms to survive. Third, individual differences in organisms are heritable. The logical consequence of these simple statements is that some organisms, because of their particular characteristics, will survive and hence reproduce at higher rates than others. Their particular traits, then, will be passed on to their descendants in higher proportions, while characteristics of organisms that are not as well suited to the environment will not. Over vast spans of time, these small incremental changes in passed-down traits result in species change. This process is known as natural selection.

Natural selection is defined as the differential survival and reproduction of different variants of members of a species and is the tool the natural world uses to shape evolutionary processes. While it is commonly described as "survival of the fittest," the key feature is in actuality reproductive success. Individuals with more adaptive traits pass on more of those traits to future generations. In this way, "fit" characteristics are selected to be passed on, and others die out.

Note that these traits can be physical (such as a tiger's stripes, which allow it to blend into the background), behavioral (such as the mating dances of many species of birds), or psychological (such as a baby monkey's need to cling to and cuddle a warm soft body).

**Ethology** is the study of the adaptive behaviors of animal species in natural contexts. The assumption is that such behaviors evolved through natural selection. Ethologists

### ethology

Study of distinctive adaptive behaviors of species of animals that have evolved to increase survival of the species.

compare animals of different species and seek to identify which behaviors are universal and which are specific to a particular species or modifiable by experience.

A related extension of the ethological approach can be found in **evolutionary psychology**. Ethologists focus on cross-species comparisons, whereas evolutionary psychologists focus on humans and apply Darwinian principles to human behavior. Just as we have opposable thumbs evolved for manual dexterity, a heart evolved to pump blood, and lungs evolved to exchange gases, we also have parts of our brains evolved to address specific adaptive problems.

The psychological products of natural selection in humans are known as cognitive adaptations. So, for example, our brains have evolved to find certain faces and body types as attractive, to strive for dominance, and to perceive babies as cute because these propensities addressed the adaptive problems of mate selection, access to resources, and survival of young. Humans have a large number of cognitive adaptations, most of which are tailored to a specific problem.

Evolutionary psychology, despite arguing that reproductive success is the key feature driving our adaptations, does not propose that people are consciously seeking to maximize their reproductive output. For example, people enjoy sexual activity even when it is not intended to lead to pregnancy. In the ancestral past where birth control was not available, sexual activity often led to pregnancy and hence greater reproductive success. Those people who had a greater desire for sex, and hence more sex, were likely to be more reproductively successful than those with less sexual desire. Thus, genes that code for sexual desire became more common. However, they are not necessarily related to a conscious desire for children. Rather, people tend to have sex because it feels good, just as natural selection designed it to feel.

Early critics of evolutionary psychology argued that evolutionary approaches reduced human behavior to the dictates of genetic imperatives. However, despite arguing that ultimately the transmission of genes is what drives evolved behaviors, evolutionary psychology is not deterministic. Evolutionary psychologists place great weight on the environment to which humans adapt and the flexibility of the human mind. Moreover, our ability to engage in abstract thought and reasoning allows us to override evolutionary influences, such as might happen when we decide to forgo a tempting piece of chocolate cake despite having a gustatory system designed to appreciate sweets.



Cognitive adaptations can be thought of as similar to apps on a smartphone: useful for specific, constrained functions. Just as in your phone, there's a mind app for almost all important human functions.

#### evolutionary psychology

Application of Darwinian principles of natural selection and survival of the fittest to individual behavior.

#### checkpoint can you . . .

- Describe the major postulates of evolutionary theory?
- Tell what kinds of topics ethologists and evolutionary psychologists study?

## Research Methods

Researchers in human development work within two methodological traditions: quantitative and qualitative. Each of these traditions has different goals and different ways of seeing and interpreting reality, and each emphasizes different means of collecting and analyzing data.

### QUANTITATIVE AND QUALITATIVE RESEARCH

**Quantitative research** deals with objectively measurable, numerical data that can answer questions such as “how much?” or “how many?” and that are amenable to statistical analysis. For example, quantitative researchers might study the fear and anxiety children feel before surgery by asking them to answer questions, using a numerical scale, about how fearful or anxious they are. These data could then be compared to data for children not facing surgery to determine whether a statistically significant difference exists between the two groups.

Quantitative research on human development is based on the **scientific method**. Its usual steps are:

1. Identification of a problem to be studied, often on the basis of a theory or of previous research;
2. Formulation of hypotheses to be tested by research;

#### quantitative research

Research that deals with objectively measurable data.

#### scientific method

System of established principles and processes of scientific inquiry, which includes identifying a problem to be studied, formulating a hypothesis to be tested by research, collecting data, analyzing the data, forming tentative conclusions, and disseminating findings.

3. Collection of data;
4. Statistical analysis of the data to determine whether they support the hypothesis;
5. Formation of tentative conclusions; and
6. Dissemination of findings so other observers can check, learn from, analyze, repeat, and build on the results.

#### **qualitative research**

Research that focuses on nonnumerical data, such as subjective experiences, feelings, or beliefs.

**Qualitative research**, in contrast, focuses on the how and why of behavior. It more commonly involves nonnumerical (verbal or pictorial) descriptions of participants' subjective understanding, feelings, or beliefs about their experiences. Qualitative researchers might study the same subject areas as quantitative researchers, but their perspective informs both how they collect data and how they interpret it. For example, if qualitative researchers were to study children's emotional state prior to surgery, they might do so with unstructured interviews or by asking children to draw their perceptions of the upcoming event. Whereas the goal in quantitative research is to generate hypotheses from previous research and empirically test them, the goal in qualitative research is to understand the "story" of the event.

The selection of quantitative or qualitative methods may depend on the purpose of the study, how much is already known about the topic, and the researcher's theoretical orientation. Quantitative research often is done in controlled laboratory settings; qualitative research typically is conducted in everyday settings, such as the home or school.

#### **population**

The entire pool of individuals under study from which a sample is drawn and to which findings may apply.

#### **sample**

Group of participants chosen to represent the entire population under study.

#### **random selection**

Selection of a sample in such a way that each person in a population has an equal and independent chance of being chosen.

#### **random sample**

A sample of individuals chosen in such a way that every individual in the population has an equal and independent chance of being chosen.

#### **WEIRD**

Acronym (Western, educated, industrialized, rich, and democratic) for the type of societies from which research samples are typically drawn.

## **SAMPLING**

Because studying an entire **population** (a group to whom the findings may apply) is usually too costly and time-consuming, investigators select a **sample**, a smaller group within the population. To be sure that the results of quantitative research are true generally, the sample should adequately represent the population under study; that is, it should show relevant characteristics in the same proportions as in the entire population. Otherwise the results cannot properly be generalized, or applied to the population as a whole.

Often quantitative researchers seek to achieve representativeness through **random selection**, in which each person in a population has an equal and independent chance of being chosen. The result of random selection is a **random sample**. A random sample, especially a large one, is likely to represent the population well. Unfortunately, a random sample of a large population is often difficult to obtain. Instead, many studies use samples selected for convenience or accessibility (such as children born in a particular hospital or college students participating for course credit). The findings of such studies may not apply to the population as a whole.

In qualitative research, samples tend to be focused rather than random. Participants may be chosen for their ability to communicate the nature of a certain experience, such as how it feels to go through puberty or menopause. A carefully selected qualitative sample may have a fair degree of generalizability.

Although psychology as a discipline has increasingly moved toward the inclusion of diverse groups in research, the majority of psychological data has been collected on **WEIRD** (Western, educated, industrialized, rich, and democratic) samples (Henrich et al., 2010). This makes it difficult to determine if psychological findings are universal, or characteristic of humans everywhere, or if they are a cultural artifact of the WEIRD samples used.

## **checkpoint** can you . . .

- Compare quantitative and qualitative research and give an example of each?
- Summarize the six steps in the scientific method and tell why each is important?
- Explain what a WEIRD sample is and how this applies to generalizability?

## **FORMS OF DATA COLLECTION**

Common ways of gathering data (Table 3) include self-reports (verbal or visual reports by study participants), observation of participants in laboratory or natural settings, and behavioral or performance measures.

**TABLE 3** Major Methods of Data Collection

Type	Main Characteristics	Advantages	Disadvantages
<b>Self-report: diary, visual reports, interview, or questionnaire</b>	Participants are asked about some aspect of their lives; questioning may be highly structured or more flexible; self-report may be verbal or visual.	Can provide firsthand information about a person's life, attitudes, or opinions Visual techniques (e.g., drawing, mapping, graphing) avoid need for verbal skills.	Participant may not remember information accurately or may distort responses in a socially desirable way; how question is asked or by whom may affect answer.
<b>Naturalistic observation</b>	People are observed in their normal setting, with no attempt to manipulate behavior.	Provides good description of behavior; does not subject people to unnatural settings that may distort behavior	Lack of control; observer bias
<b>Laboratory observation</b>	Participants are observed in the laboratory, with no attempt to manipulate behavior.	Provides good descriptions; offers greater control than naturalistic observation because all participants are observed under same controlled conditions	Observer bias; controlled situation can be artificial
<b>Behavioral and performance measures</b>	Participants are tested on abilities, skills, knowledge, competencies, or physical responses.	Provides objectively measurable information; avoids subjective distortions	Cannot measure attitudes or other nonbehavioral phenomena; results may be affected by extraneous factors

**Self-Reports** The simplest form of self-report is a diary or log. Adolescents may be asked, for example, to record what they eat each day or the times when they feel depressed. In studying young children, parental self-reports—diaries, journals, interviews, or questionnaires—are commonly used, often together with other methods, such as videotaping or recording. Visual representation techniques—asking participants to draw or paint or to provide maps or graphs that illuminate their experience—can avoid reliance on verbal skills.

In a face-to-face or telephone interview, researchers ask questions about attitudes, opinions, or behavior. In a structured interview, each participant is asked the same set of questions. An open-ended interview is more flexible; the interviewer can vary the topics and order of questions and can ask follow-up questions based on the responses. To reach more people and to protect their privacy, researchers sometimes distribute a printed or online questionnaire, which participants fill out.

By questioning a large number of people, investigators can get a broad picture—at least of what the respondents say they believe or do or did. However, people willing to participate in interviews or fill out questionnaires may not accurately represent the population as a whole. Furthermore, heavy reliance on self-reports may be unwise because people may not have thought about what they feel and think or honestly may not know. They may forget when and how events took place or may consciously or unconsciously distort their replies to fit what is considered socially desirable.

*Self-report data indicates 46 percent of Americans believe in ghosts (Ipsos, 2019).*



**Naturalistic and Laboratory Observation** Observation takes two forms: naturalistic observation and laboratory observation. In **naturalistic observation**, researchers look at people in real-life settings. The researchers do not try to alter behavior or the environment; they simply record what they see. In **laboratory observation**, researchers observe and record behavior in a controlled environment, such as a laboratory.

Both kinds of observation can provide valuable descriptions of behavior, but they have limitations. For one, they do not explain why people behave as they do, though

#### naturalistic observation

Research method in which behavior is studied in natural settings without intervention or manipulation.

#### laboratory observation

Research method in which all participants are observed under the same controlled conditions.



A baby under laboratory observation may or may not behave the same way as in a naturalistic setting, such as at home, but both kinds of observation can provide valuable information.

Thierry Berrod, Mona Lisa Production/Science Source

*Observation doesn't work terribly well for very rare events either.*



*Suppose you wanted to do research on heroic rescues and decided to wait by a bridge to observe whether anyone helps when people try to commit suicide by jumping off. How long would you be waiting?*

#### **observer bias**

Any expectations, beliefs, or personal preferences of a researcher that unintentionally influence their findings.

the observers may suggest interpretations. Then, too, an observer's presence can alter behavior. When people know they are being watched, they may act differently. Finally, there is a risk of **observer bias**: the researcher's tendency to interpret data to fit expectations or to emphasize some aspects and minimize others.

## **EVALUATING QUANTITATIVE AND QUALITATIVE RESEARCH**

In comparison with quantitative research based on the scientific method, qualitative research has both strengths and limitations. On the positive side, qualitative research can examine a question in great depth and detail, and the research framework can readily be revised in the light of new data. Findings of qualitative research can be a rich source of insights into attitudes and behavior. The interactive relationship between investigators and participants can humanize the research process and reveal information that would not emerge under the more impersonal conditions of quantitative research. On the other hand, qualitative research tends to be less rigorous and more subject to bias than quantitative research. Because samples are often small and usually not random, results are less generalizable and replicable than the results of quantitative research. The large volume of data makes analysis and interpretation time-consuming, and the quality of the findings and conclusions depends greatly on the skills of the researcher (Mathie & Carnozzi, 2005).

Yet the line between these methodologies is not necessarily clear-cut. Qualitative data may be analyzed quantitatively; for example, by statistical analysis of interview transcripts or videotaped observations to see how many times certain themes or behaviors occur. Conversely, quantitative data may be illuminated by qualitative research; for example, by interviews designed to examine the motivations and attitudes of children who make high scores on achievement tests.

## **BASIC RESEARCH DESIGNS**

Four basic designs used in developmental research are case studies, ethnographic studies, correlational studies, and experiments. Case studies and ethnographic studies are primarily qualitative in nature, while correlational and experimental studies generally use quantitative methodology. Each design has advantages and drawbacks, and each is appropriate for certain kinds of research problems (Table 4).

**TABLE 4 Basic Research Designs**

Type	Main Characteristics	Advantages	Disadvantages
<b>Case study</b>	In-depth study of single individual	Provides detailed picture of one person's behavior and development; can generate hypotheses	May not generalize to others; conclusions not directly testable; cannot establish cause and effect
<b>Ethnographic study</b>	In-depth study of a culture or subculture	Can help overcome culturally based biases in theory and research; can test universality of developmental phenomena	Subject to observer bias
<b>Correlational study</b>	Attempt to find positive or negative relationship between variables	Enables prediction of one variable on basis of another; can suggest hypotheses about causal relationships	Cannot establish cause and effect
<b>Experiment</b>	Controlled procedure conducted in a laboratory or the field in which an independent variable is manipulated to determine its effect on a dependent variable	Establishes cause-and-effect relationships; is highly controlled and can be repeated by another investigator	Findings, especially when derived from laboratory experiments, may not generalize to situations outside the laboratory

# Window on the world

## CROSS-CULTURAL RESEARCH

When David, a European American child, was asked to identify the missing detail in a picture of a face with no mouth, he said, "The mouth." But Ari, an Asian immigrant child in Israel, said that the body was missing. Since art in his culture does not present a head as a complete picture, he thought the absence of a body was more important than the omission of "a mere detail like the mouth" (Anastasi, 1988, p. 360).

By looking at children from different cultural groups, researchers can learn in what ways development is universal (and thus intrinsic to the human condition) and in what ways it is culturally determined. For example, children everywhere learn to speak in the same sequence, advancing from cooing and babbling to single words and then to simple combinations of words. The words vary from culture to culture, but toddlers around the world put them together in the same ways to form sentences. Such findings suggest that the capacity for learning language is universal and inborn.

On the other hand, culture influences particular sets of skills learned. In the United States, children learn to read, write, and, increasingly, to operate computers. In rural Nepal, they learn how to drive water buffalo and find their way along mountain paths.

One important reason to conduct research among different cultural groups is to recognize biases in traditional Western theories and research that often go unquestioned until they are shown to be a product of cultural influences. In this book, we discuss several influential theories developed from research in Western societies that do not hold up when tested on people from other cultures—theories about gender roles, abstract thinking, moral reasoning, and other aspects of human development. Because so much research in child development has focused on Western industrialized societies, typical development in these societies may be seen as the norm, or standard of behavior. Measuring against this "norm" leads to narrow—and often wrong—ideas about development.



Can you think of a situation in which you made an incorrect assumption about a person because you were unfamiliar with their cultural background? Can you think of a time this happened to you?

**Case Studies** A **case study** is a study of an individual. Case studies may use behavioral or physiological measures and biographical, autobiographical, or documentary materials. Case studies are particularly useful when studying something relatively rare, when it simply is not possible to find a large enough group of people with the characteristic in question to conduct a traditional laboratory study. Case studies offer useful, in-depth information. They can explore sources of behavior and can test treatments, and they suggest directions for further research.

Case studies do have shortcomings, however. Using case studies, we can learn much about the development of a single person but not how the information applies to people in general. Furthermore, case studies cannot explain behavior with certainty or make strong causal statements because there is no way to test their conclusions.

**Ethnographic Studies** An **ethnographic study** seeks to describe the pattern of relationships, customs, beliefs, technology, arts, and traditions that make up a society's way of life. In a way, it is like a case study of a culture. Ethnographic research can be qualitative, quantitative, or both. It uses a combination of methods, including informal, unstructured interviewing and **participant observation**. Participant observation is a form of naturalistic observation in which researchers live or participate in the societies or smaller groups they observe, as anthropologists often do for long periods of time.

Because of ethnographers' involvement in the events or societies they are observing, their findings are especially open to observer bias. On the positive side, ethnographic research can help overcome cultural biases in theory and research (Window on the World). Ethnography demonstrates the error of assuming that principles developed from research in Western cultures are universally applicable.

### case study

Study of a single subject, such as an individual or family.

### ethnographic study

In-depth study of a culture, which uses a combination of methods including participant observation.

### participant observation

Research method in which the observer lives with the people or participates in the activity being observed.

In 1937, at the age of 54, Ruth Underhill received her PhD in anthropology. She then conducted one of the earliest scientific studies of indigenous people in her work with the Tohono O'odman, a Native American peoples of the Sonoran desert in Arizona. This important ethnography was among early works helping dispel harmful stereotypes about indigenous populations.



A correlation of  $+/- 1.0$  means you are measuring the same thing in different ways. For example, inches and centimeters are perfectly correlated.



#### correlational study

Research design intended to discover whether a statistical relationship between variables exists.

#### experiment

Rigorously controlled, replicable procedure in which the researcher manipulates variables to assess the effect of one on the other.

#### experimental group

In an experiment, the group receiving the treatment under study.

#### control group

In an experiment, a group of people, similar to those in the experimental group, who do not receive the treatment under study.

**Correlational Studies** A **correlational study** seeks to determine whether a correlation, or statistical relationship, exists between variables, phenomena that change or vary among people or can be varied for purposes of research. Correlations are expressed in terms of direction (positive or negative) and magnitude (degree). Two variables that are correlated positively increase or decrease together. For example, the more time spent on social media, the greater the risk of depression (Ivie et al., 2020). Two variables have a negative, or inverse, correlation if, as one increases, the other decreases. So, for example, studies show a negative correlation between social media usage and well-being. Greater use of social media is associated with a lower levels of well-being (Duradoni et al., 2020).

Correlations are reported as numbers ranging from  $-1.0$  (a perfect negative relationship) to  $+1.0$  (a perfect positive relationship). Perfect correlations are rare. The closer a correlation comes to  $+1.0$  or  $-1.0$ , the stronger the relationship, either positive or negative. A correlation of zero means that the variables have no relationship.

Correlations enable us to predict one variable in relation to another. For instance, on the basis of the positive correlation between watching televised violence and aggression, we can predict that children who watch violent shows are more likely to get into fights than children who do not watch such shows. The greater the magnitude of the correlation between the two variables, the greater the ability to predict one from the other.

Although strong correlations suggest possible cause-and-effect relationships, these are merely hypotheses and need to be examined and tested critically. Correlation does not equal causation. It is possible that the causation goes the other way or that a third variable explains the relationship. For example, a strong positive correlation exists between the number of churches in a town and the number of liquor bottles found in the garbage cans of that town. One might theorize that heavy drinkers seek out religion or, alternatively, that religion drives people to drink. But a third variable—in this case, population size—is the true causal influence. Larger towns have more churches, more garbage cans, and more liquor bottles in those cans. Churchgoing and drinking are associated with each other but not in a causal way.

**Experimental Studies** An **experiment** is a controlled procedure in which the experimenter manipulates variables to learn how one affects another. Scientific experiments must be conducted and reported in such a way that another experimenter can replicate them, that is, repeat them in exactly the same way with different participants to verify the results and conclusions.

**Groups and Variables** A common way to conduct an experiment is to divide the participants into two kinds of groups. An **experimental group** consists of people who are to be exposed to the experimental manipulation or treatment—the phenomenon the researcher wants to study. Afterward, the effect of the treatment will be measured one or more times to find out what changes, if any, it caused. A **control group** consists of people who are similar to the experimental group but do not receive the experimental treatment or may receive a different treatment. An experiment may include one or more of each type of group. If the experimenter wants to compare the effects of different treatments (say, of two methods of teaching), the overall sample may be divided into treatment groups, each of which receives one of the treatments under study. To ensure objectivity, some experiments, particularly in medical research, use double-blind procedures, in which neither participants nor experimenters know who is receiving the treatment and who is instead receiving an inert placebo or is in the control condition.

For example, one team of researchers wanted to find out if 11-month-old infants could be trained to focus their attention (Wass et al., 2011). The researchers brought 42 infants to their laboratory and had them participate in a variety of tasks. Half of the infants were given about an hour of attentional training. This training required babies to use sustained gaze to make a fun event happen on a computer. For example, if babies fixated on an elephant, the elephant became animated. If the babies looked away, the elephant stopped moving. The other group of children were shown television clips and

animations but were not trained. At the end of 2 weeks, the babies were tested on a series of cognitive tasks. Babies who underwent the training performed better on the tasks than did the babies who were not trained. It is reasonable to conclude, then, that the attentional training improved the babies' performance on the tasks as it was the only thing varied between the two groups.

In this experiment, the type of activity (training versus watching television) was the independent variable, and the children's test performance the dependent variable. An **independent variable** is something the researcher directly manipulates to see if it has an effect on another variable. A **dependent variable** is something that may or may not change as a result of changes in the independent variable; in other words, it depends on the independent variable. In an experiment, a researcher manipulates the independent variable to see how changes in it will affect the dependent variable. The hypothesis for a study states how a researcher thinks the independent variable affects the dependent variable.

It is important, when conducting research, to define exactly what is to be measured in a way that other researchers can replicate, or reproduce. For this purpose, researchers use an **operational definition**—a definition stated solely in terms of the operations used to measure a phenomenon. In the Wass et al. (2011) study cited above, children's improved cognitive performance was defined as being able to sustain attention toward an interesting object for a longer period of time and being able to switch attention from an object to a person more rapidly. Had the researchers merely stated the children performed "better," it would have been unclear exactly what this meant. By specifying the variable precisely, other researchers know exactly what was done and could therefore reproduce the study and comment on the results.

*Random Assignment* If an experiment finds a significant difference in the performance of the experimental and control groups, how do we know that the cause was the independent variable? For example, in the attentional training experiment, how can we be sure that the training and not some other factor (such as intelligence) caused the difference in test performance of the two groups? The best way to control for effects of such extraneous factors is **random assignment**: assigning the participants to groups in such a way that each person has an equal chance of being placed in any group.

If assignment is random and the sample is large enough, differences in such factors as age, gender, and ethnicity should be evenly distributed so that the groups initially are as alike as possible in every respect except for the variable to be tested. Otherwise, unintended differences between the groups might confound, or contaminate, the results, and any conclusions drawn from the experiment would have to be viewed with suspicion. To control for confounds, the experimenter must make sure that everything except the independent variable is held constant during the course of the experiment. When participants in an experiment are randomly assigned to treatment groups and conditions other than the independent variable are carefully controlled, the experimenter can be reasonably confident that a causal relationship has (or has not) been established. In other words, any differences found between groups can be attributed to the action of the independent variable (in this case, training) and not some other factor.

Of course, with respect to some variables we might want to study, such as age, gender, and race/ethnicity, random assignment is not possible. We cannot assign Terry to be 5 years old and Brett to be 10 or one to be a boy and the other a girl. When studying such a variable—for example, whether boys or girls are stronger in certain abilities—researchers can strengthen the validity of their conclusions by randomly selecting participants and by trying to make sure that they are statistically equivalent in other ways that might make a difference in the study.

**Laboratory, Field, and Natural Experiments** There are various ways to conduct research, and one essential distinction is between laboratory, field, and natural experiments. A laboratory experiment is best for determining cause and effect; it generally consists of asking participants to visit a laboratory where they are subject to conditions



Dependent variables are also known as "end measures" because their values are used to check whether you are right at the end of the study.

#### independent variable

In an experiment, the condition over which the experimenter has direct control.

#### dependent variable

In an experiment, the condition that may or may not change as a result of changes in the independent variable.

#### operational definition

Definition stated solely in terms of the operations or procedures used to produce or measure a phenomenon.

#### random assignment

Assignment of participants in an experiment to groups in such a way that each person has an equal chance of being placed in any group.



Research conducted on Hurricane Katrina survivors that compared them to people in other cities who were similar on many measures, except for the experience of living through the traumatic events of the hurricane, is an example of a quasi-experimental design.

#### **cross-sectional study**

Study designed to assess age-related differences, in which people of different ages are assessed on one occasion.

#### **longitudinal study**

Study designed to assess age changes in a sample over time.

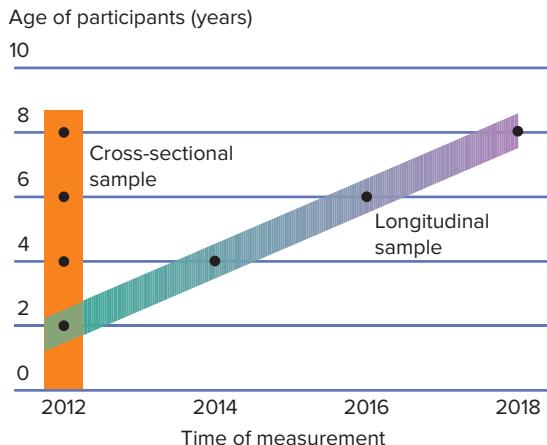
#### **sequential study**

Study design that combines cross-sectional and longitudinal techniques.

## checkpoint

can you...

- ▶ Compare the uses and drawbacks of case studies, ethnographic studies, correlational studies, and experiments?
- ▶ Explain why only a controlled experiment can establish causal relationships?
- ▶ Distinguish among laboratory, field, and natural experiments and tell what kinds of research seem most suitable to each?
- ▶ Compare the advantages and disadvantages of various forms of data collection?



**FIGURE 3**

### Developmental Research Designs

In the cross-sectional study, groups of 2-, 4-, 6-, and 8-year-olds were tested in 2012 to obtain data about age-related differences. In the longitudinal study, a sample of children were first measured in 2012, when they were 2 years old; follow-up testing was done when the children were 4, 6, and 8, to measure age-related changes. Note: Dots indicate times of measurement.

manipulated by the experimenter. The tight control of a laboratory study allows researchers to be more certain that their independent variable caused change in their dependent variable; however, because of the artificiality of the laboratory experience, the results may be less generalizable to real life. People may not act as they typically would.

A field experiment is a controlled study conducted in an everyday setting, such as a home or school. Variables can still be manipulated, so causal claims can still be investigated. Because the experiments occur in the real world, there is more confidence that the behaviors that are seen are generalizable to natural behaviors. However, researchers have less control over events that may occur; the real world is often messy, and things do not always go as planned.

When, for practical or ethical reasons, it is impossible to conduct a true experiment, a natural experiment, also called a quasi-experiment, may provide a way of studying certain events. A natural experiment compares people who have been accidentally “assigned” to separate groups by circumstances of life—one group that was exposed, say, to famine or HIV or superior education and another group that was not. A natural experiment, despite its name, is actually a correlational study because controlled manipulation of variables and random assignment to treatment groups are not possible.

## DEVELOPMENTAL RESEARCH DESIGNS

One of the primary goals of developmental research is to study change over time, and developmental psychologists have developed a variety of methods to do so. The two most common research strategies are cross-sectional and longitudinal studies (Figure 3). A **cross-sectional study** most clearly illustrates similarities or differences among people of different ages; a **longitudinal study** tracks people over time and focuses on individual change with age. Both designs have pros and cons. A third type of study, a **sequential study**, combines the two approaches to minimize the drawbacks of the separate approaches.

In a cross-sectional study, people of different ages are assessed at one point in time. Generally, the participants are matched on other important characteristics and their ages are varied. In one cross-sectional study, researchers asked 3- to 5-year-old children to play

a game, during which time adults within hearing range of each child either discussed how a prior participant was really smart or had a conversation that did not include social information. Five-year-olds, but not 3-year-olds, who heard the adults praise the intelligence of a previous child were more likely to cheat while playing the game (Zhao et al., 2019). These findings suggest that children are increasingly affected by evaluative information with age. However, we cannot draw such a conclusion with certainty. We don't know whether the 5-year-olds' sensitivity to overheard praise when they were 3 years old was the same as that of the current 3-year-olds in the study. The only way to see whether change occurs with age is to conduct a longitudinal study of a particular person or group.

In a longitudinal study, researchers study the same person or group of people more than once, sometimes years apart. For example, in one study, researchers were interested in whether or not lying to and keeping secrets from parents were related to relationship quality and depression in children. The researchers found that although lying was not predictive, secret-keeping was related to poorer parent-child relationship quality and higher levels of depression the following year (Dykstra et al., 2020).

Just as with cross-sectional designs, there is a caveat. Because individual people are studied over time, researchers have access to each person's specific individual trajectory. However, the results from one cohort might not apply to a study of a different cohort.

In attempting to determine the best research design, neither cross-sectional nor longitudinal design is superior. Rather, both designs have strengths and weaknesses (Table 5). For example, cross-sectional design is fast—we don't have to wait 30 years for results. This also makes it a more

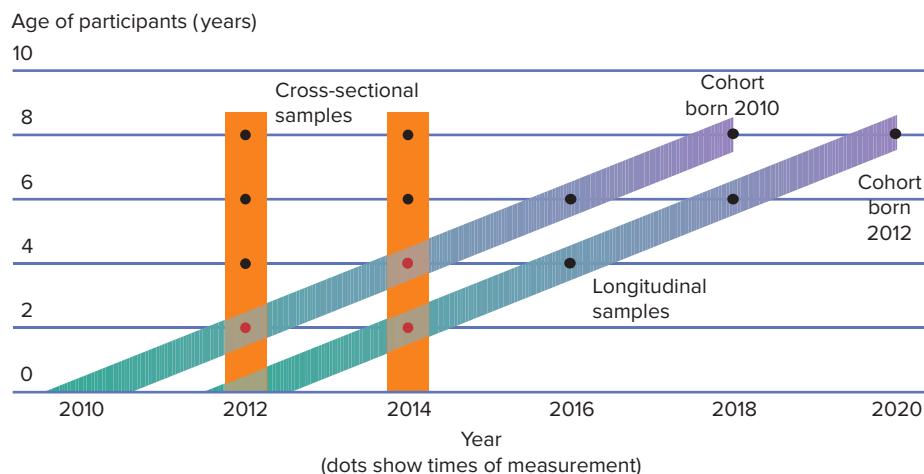
**TABLE 5** Cross-Sectional, Longitudinal, and Sequential Research: Pros and Cons

Type of Study	Procedure	Advantages	Disadvantages
<b>Cross-sectional</b>	Data are collected on people of different ages at the same time.	Can show similarities and differences among age groups; speedy, economical; presents no problem of attrition or repeated testing	Cannot establish age effects; masks individual differences; can be confounded by cohort effects
<b>Longitudinal</b>	Data are collected on same person or persons over a period of time.	Can show age-related change or continuity; avoids confounding age with cohort effects	Is time-consuming, expensive; presents problems of attrition, bias in sample, and effects of repeated testing; results may be valid only for cohort tested or sample studied
<b>Sequential</b>	Data are collected on successive cross-sectional or longitudinal samples.	Can avoid drawbacks of both cross-sectional and longitudinal designs	Requires large amount of time and effort and analysis of very complex data

economical choice. Moreover, because participants are assessed only once, we don't have to consider attrition (people dropping out of the study) or repeated testing (which can produce practice effects). But cross-sectional design uses group averages, so individual differences and trajectories may be obscured. More important, the results can be affected by the differing experiences of people born at different times, as previously explained.

Longitudinal research shows a different and complementary set of strengths and weaknesses. Because the same people are studied repeatedly over time, researchers can track individual patterns of continuity and change. This makes longitudinal studies more time-consuming and expensive than cross-sectional studies. In addition, repeated testing of participants can result in practice effects. For example, your performance on an intelligence test might get better over time from practice rather than from any increase in intelligence. Attrition can be problematic in longitudinal research as well because it tends to be non-random, which can introduce a positive bias to the study. Those who stay with the study tend to be above average in intelligence and socioeconomic status, and those who drop out tend to have more chaotic lives and worse overall outcomes. Moreover, practical issues, such as turnover in research personnel, loss of funding, or the development of new measures or methodologies, can introduce potential problems with data collection.

Researchers are attempting to overcome the drawbacks of longitudinal and cross-sectional design with the design of sequential studies. Sequential designs track people of different ages (like cross-sectional designs) over time (like longitudinal designs). The combination of cross-sectional and longitudinal designs (as shown in Figure 4) allows researchers to separate age-related changes from cohort effects and provides a more

**FIGURE 4**  
A Sequential Design

Two successive cross-sectional groups of 2-, 4-, 6-, and 8-year-olds were tested in 2012 and 2014. Also, a longitudinal study of a group of children first measured in 2012, when they were 2 years old, is followed by a similar longitudinal study of another group of children who were 2 years old in 2014.

- List advantages and disadvantages of longitudinal, cross-sectional, and sequential research?

Questions about diversity in psychological research are not new. In 1976, African American psychologist Robert Val Guthrie famously wrote, in reference to the issue, "even the rat was white" (Guthrie, 1976).



complete picture of development than would be possible with either design alone. The major drawbacks of sequential studies relate to time, effort, and complexity. Sequential designs require large numbers of participants and collection and analysis of huge amounts of data over a period of years. Interpreting these findings and conclusions can demand a high degree of sophistication.

## Research Issues

Current issues in psychological research include the need for diversity in both researchers and subjects, the open science movement and the reproducibility crisis, and scientific ethics.

### DIVERSITY IN RESEARCH

Diversity can include race, ethnicity, gender, sexual orientation, age, religion, disability, socioeconomic status, political orientation, and so forth. In short, *diversity* is a term as wide as are human experiences. However, while steps toward including more diverse participants in research have been made, the majority of those who conduct such research, including university faculty, authors, editors, and gatekeepers, are White. Although the number of women in particular areas (such as developmental and social psychology) has risen (Roberts et al., 2020), little to no information exists on the representation of other groups as most academic journals do not keep track of this data (Wu, 2020).

This is unfortunate for a variety of reasons. First, people's experiences shape their understanding of the world, and if most research is carried out within one narrow frame of reference, we risk misunderstanding or minimizing the influence of diverse experiences and thus misrepresenting human psychology. Second, diverse groups produce more, more innovative, and higher-quality research (Swartz et al., 2019). For example, diverse groups publish and are cited more (AlShebli et al., 2018). Last, many researchers in the field care deeply about a just world, and as such, the inclusion of diverse others is a worthy goal regardless of methodological or theoretical concerns (Research in Action).

### THE OPEN SCIENCE MOVEMENT AND THE REPRODUCIBILITY CRISIS

In recent years, an increasing number of psychologists have called for steps to increase the integrity, reproducibility, and accessibility of scientific work.

For example, some psychologists have become concerned over a "reproducibility crisis" in the social sciences. Because replication of results is a cornerstone of the scientific approach, it is important that scientific findings are capable of being duplicated and verified. However, there are suggestions that some of the weaker findings in psychology may not hold water once they are examined more closely. In one large project, more than 100 correlational and experimental psychology studies were carefully reproduced. Only about half of the replications yielded the same statistical conclusion, even though results were generally in the same direction (Aarts et al., 2015). How did so many statistically weak studies get published?

Part of the reason for this is the journals in which psychological research is published are biased toward the publication of novel findings (Martin & Clarke, 2017), and replications of prior work are less likely to be published. This is especially true if they fail to reach significance (in other words, if they fail to find an expected effect).

Moreover, although it is considered unethical, because of the intense pressure to publish, researchers sometimes engage in "p-hacking." P-hacking involves combing through data until a statistically significant result is found and then developing a post hoc (after the fact) explanation for the finding. Because, by chance, a large enough

## BROADENING THE NARRATIVE: DIVERSITY IN PSYCHOLOGICAL RESEARCH

From 2010 to 2020, racial and ethnic diversity in the United States surged (US Census Bureau, 2020). This shift means diversity is now a fundamental feature of the US demographic profile rather than just a footnote. As a field, psychology has failed to match the rate of societal progression toward demographic diversity (Settles et al., 2020). For instance, the current psychological workforce is 60 percent less diverse than the US population (APA, 2020), and psychological research samples favor majority group representation (Cheon et al., 2020).

One reason the field may lack diversity is that BIPOC psychologists are treated differently than psychologists from majority groups. In academia, for example, BIPOC psychologists often face barriers such as the “minority tax”—when minority faculty are assigned extra responsibilities in the name of diversity (Carey et al., 2020). Minority faculty may also be subject to tokenism, marginalization, and racial microaggressions (Settles et al., 2020). Furthermore, psychologists who speak out on the field’s lack of diversity are often criticized, which sidelines them and their research (DiAngelo, 2018; Buchanan et al., 2020).

Scientists of color are more likely to include diverse participants in their research (Roberts et al., 2020); thus, the relative lack of diverse researchers in psychology also leads to the underrepresentation of minorities in research samples. This process has led to the overrepresentation of findings of young, White adults from Western, educated, industrialized, rich, and democratic (WEIRD) populations (Henrich et al., 2010). Conclusions drawn from these studies presume White individuals reflect American society, but they do not. Therefore, diversifying psychological research also improves the generaliz-

ability and replicability of results (Cheon et al., 2020).

Where do we go from here? Roberts and colleagues (2020) developed the following recommendations for scientific journals that should also promote diversity within research institutions. First, there should be commitment to diversity by the leadership. Second, there must be diversity at all levels of decision-making processes. Third, there should be diversity in applications. Fourth, diversity reports should be disseminated. And last, a diversity-oriented task force should be formed.

Additionally, Roberts and colleagues (2020) advised journal authors, in their work, to detail and justify the racial demographics of research samples, to use caution in making statements to generalize research to populations for which it may not be suitable, and to include information on their own identity and how they see the world.

American society is undoubtedly richer because of its diversity. To conduct research that captures the complexity of our society, the field of psychology itself must be diverse.



Does research really require diverse researchers, or could it have researchers with similar racial and ethnic backgrounds who are trained from a more diversity-oriented approach?

How important is it for young scholars to see scientists of color in psychology? How would it influence their career paths?

data set will almost always provide a significant result of some sort, p-hacking can lead to the publication of misleading results with few applications to the real world.

Issues such as these have led a growing number of researchers to call for guidelines to ensure the integrity of psychological findings. Among these guidelines are calls for a more open and transparent science, studies using larger numbers of participants, and a preference for stronger effects more likely to have an impact in the real world. Most important, the integrity of data analyses could be verified by requiring researchers to register pre-reports on statistical hypotheses to be tested before the collection of data (Nosek & Lindsay, 2018; Munafò et al., 2017).

## RESEARCH ETHICS

Should research that might harm its participants ever be undertaken? How can we balance the possible benefits against the risk of mental, emotional, or physical injury to individuals?

Institutional review boards at colleges, universities, and other institutions review proposed research from an ethical standpoint. Guidelines of the American Psychological Association (APA, 2002) cover such issues as informed consent (consent freely given with full knowledge of what the research entails), avoidance of deception, protection of participants from harm and loss of dignity, guarantees of privacy and confidentiality, the right to decline or withdraw from an experiment at any time, and the responsibility of investigators to correct any undesirable effects, such as anxiety or shame.

The Tuskegee study was a notorious government experiment in which African American men with syphilis were left untreated for decades so scientists could study the course of the disease. Which ethical principles are violated in such an experiment?



### checkpoint can you ...

- List at least three ethical issues affecting rights of research participants?
- Identify three principles that should govern inclusion of participants in research?

Developmental psychologists must be particularly careful as their research frequently involves vulnerable individuals, such as infants or children. In response, the Society for Research in Child Development (2007) has developed standards for age-appropriate treatment of children in research, covering such principles as avoidance of physical or psychological harm, obtaining the child's assent as well as a parent's or guardian's informed consent, and responsibility to follow up on any information that could jeopardize the child's well-being. For example, infants' and very young children's ability to cope with the stress of the research situation may hinge on the presence of a parent or trusted caregiver, a familiar setting and procedure, and familiar objects.

## summary and key terms

### Basic Theoretical Issues

- A theory is used to organize and explain data and generate hypotheses that can be tested by research.
- Developmental theories differ on two basic issues: the active or reactive character of development and the existence of continuity or discontinuity in development.
- Two contrasting models of human development are the mechanistic model and the organismic model.  
**theory** (21)  
**hypotheses** (21)  
**mechanistic model** (21)

**organismic model** (22)  
**quantitative change** (22)  
**qualitative change** (22)

### Theoretical Perspectives

- The psychoanalytic perspective sees development as motivated by unconscious emotional drives or conflicts. Leading examples are Freud's and Erikson's theories.  
**psychoanalytic perspective** (23)  
**psychosexual development** (23)  
**psychosocial development** (26)

- The learning perspective views development as a result of learning based on experience. Leading examples are Watson's and Skinner's behaviorism and Bandura's social learning (social cognitive) theory.
    - learning perspective** (26)
    - behaviorism** (26)
    - classical conditioning** (27)
    - operant conditioning** (27)
    - reinforcement** (27)
    - punishment** (27)
    - social learning theory** (28)
    - reciprocal determinism** (28)
    - observational learning** (28)
    - self-efficacy** (28)
  - The cognitive perspective is concerned with thought processes. Leading examples are Piaget's cognitive-stage theory, Vygotsky's sociocultural theory, and the information-processing approach.
    - cognitive perspective** (29)
    - cognitive-stage theory** (29)
    - organization** (29)
    - schemes** (29)
    - adaptation** (29)
    - assimilation** (29)
    - accommodation** (29)
    - equilibration** (29)
    - sociocultural theory** (30)
    - zone of proximal development (ZPD)** (30)
    - scaffolding** (30)
    - information-processing approach** (30)
  - The contextual perspective focuses on the individual in a social context. A leading example is Bronfenbrenner's bioecological theory.
    - contextual perspective** (31)
    - bioecological theory** (31)
  - The evolutionary/sociobiological perspective focuses on the adaptiveness, or survival value, of behavior. It proposes that the mind has many cognitive adaptations designed to deal with recurrent adaptive problems.
    - evolutionary/sociobiological perspective** (32)
    - ethology** (32)
    - evolutionary psychology** (33)
- random sample** (34)      **laboratory observation** (35)  
**WEIRD** (34)      **observer bias** (36)  
**naturalistic observation** (35)

## Research Methods

- Research can be either quantitative or qualitative, or both.
- To arrive at sound conclusions, quantitative researchers use the scientific method.
- Random selection of a research sample can ensure generalizability.
- Three forms of data collection are self-reports, observation, and behavioral and performance measures.
  - quantitative research** (33)
  - scientific method** (33)
  - qualitative research** (34)
  - population** (34)
  - sample** (34)
  - random selection** (34)

## Research Issues

- Psychologists are increasingly concerned with incorporating diversity into scientific research.
- The open science movement calls for increased integrity, reproducibility, and accessibility of scientific work.
- Researchers seek to resolve ethical issues on the basis of principles of beneficence, respect, and justice.
- Standards for protection of children used in research cover such principles as parental informed consent and protection from harm or jeopardy to the child's well-being.

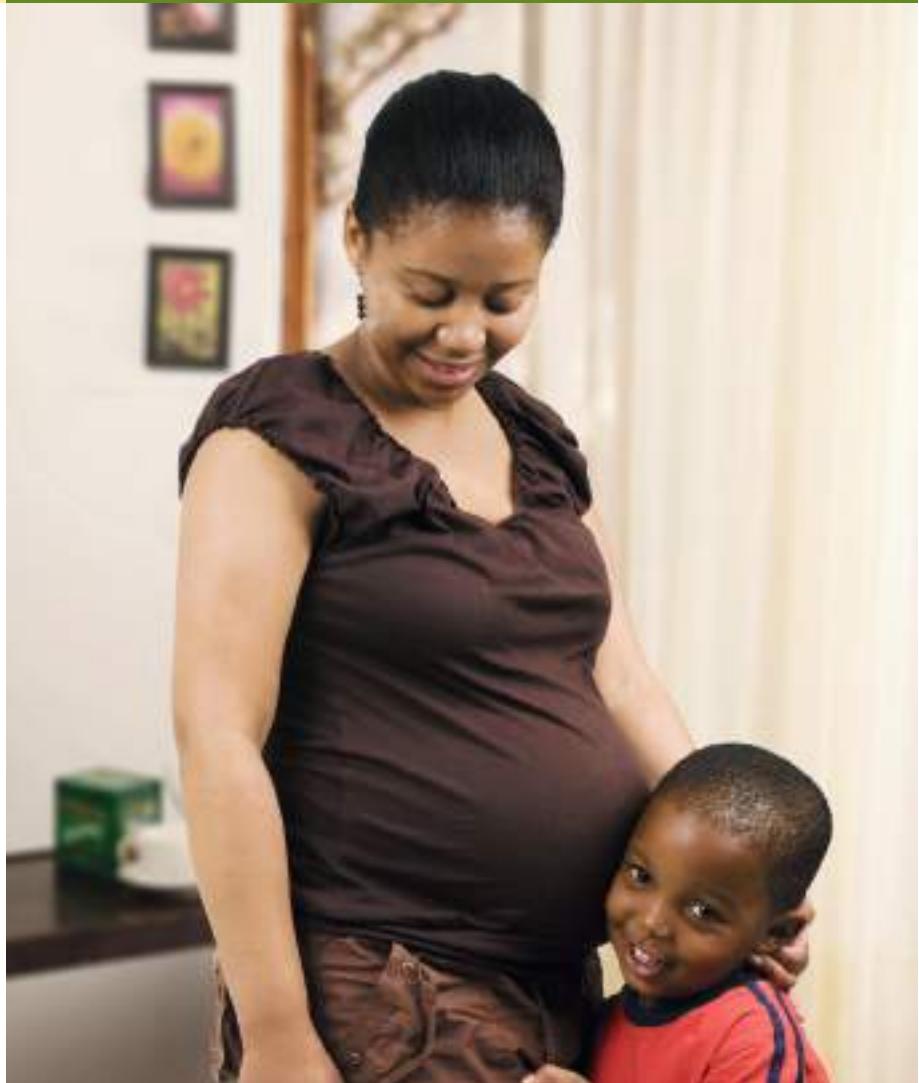
# Forming a New Life

## outline

- Conceiving New Life
- Mechanisms of Heredity
- Studying the Influences of Heredity and Environment
- Prenatal Development
- Monitoring and Promoting Prenatal Development

## learning objectives

- Explain how conception occurs and what causes multiple births.
- Describe the mechanisms of heredity in normal and abnormal human development.
- Explain how heredity and environment interact in human development.
- Describe prenatal development, including environmental influences.
- Discuss the importance of high-quality prenatal care.



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## did you know?

- A person's biological sex is determined by the father.
- Fetuses can learn and remember while in the womb, and they respond to their mother's voice.
- The women most at risk of bearing low-birth-weight babies—teenage and unmarried women, those with little education, and some BIPOC women—are least likely to receive prenatal care.

*In this chapter, we describe conception, how the mechanisms of heredity operate, and how biological inheritance interacts with environmental influences within and outside the womb. We trace the course of prenatal development, describe influences on it, and discuss ways to monitor it. Because most pregnancies go well, we focus on this but also include information on factors leading to negative outcomes.*



**B**ecause you are alive, everything is possible.  
—Thich Nhat Hanh (1926–2022)

# Conceiving New Life

Most people think of development as beginning on the day of birth, when the new child—squalling and thrashing—is introduced to the world. But development begins earlier than that, when sperm and egg unite and form a new individual. Genes mix and guide development, and both influence and are influenced by an ever-changing environment. Risks exist: A child might inherit a dangerous gene variant, a young woman might have difficulty securing prenatal care, a global pandemic might isolate and unnerve a family. But great resilience, too, exists. Here, we examine the very beginnings of life and its influences.

## CULTURAL BELIEFS ABOUT CONCEPTION

Folk beliefs about the origin of life have been common throughout history and express values and orientations important in a culture. For example, traditional religious beliefs in Judaism, Islam, and Christianity alluded to the the implanting of a seed by a man in the fertile soil of the mother (Delaney, 1991). The belief that children came from wells, springs, or rocks was common in northern and central Europe as recently as the early 1900s (Gélis & Morris, 1991).

In the matrilineal society of the Trobrianders of New Guinea, conception is believed to occur when the spirit of a dead person enters a woman's body and mixes with her menstrual blood (Weiner, 1988). By contrast, the Hua of New Guinea believe conception to be the product of the mixing of menstrual blood and semen (Meigs & Meigs, 1984). The understanding of the fertile window varies as well. Cross-cultural research indicates the Arancanians of Chile, the Gusii of Kenya, and the Tarahumarians of Mexico believed conception to be most likely during menstruation. However, the Maria Gonds of India, the Marquesas of French Polynesia, the Lepcha of India and Nepal, the Masai of Kenya and Tanzania, the Pukapuka of the Cook Islands, and the Baiga of India believed the ideal conception period to be the days immediately following menstruation (Montgomery, 1974).

Cosmic forces were also believed to influence conception. In early modern Europe, a baby conceived under a new moon would be a boy; one conceived during the moon's last quarter, a girl (Gélis & Morris, 1991). Among the Warlpiri people of Australia, a baby conceived in a place associated with a particular spirit is believed to have been given life by that spirit (DeLoache & Gottlieb, 2000). Some Chinese families plan children around the zodiac calendar, and pregnancy rates rise in auspicious dragon years (Beam & Shrestha, 2020). In Western countries such as the United States, beliefs about how personality might be shaped by the time of year in which children are born persist—as the astrology sections in many newspapers and magazines attest.

Although our modern understanding may differ from these beliefs, most parents worldwide view conception as a momentous event. The particular paths taken by new parents, however, varies in concert with factors such as race, ethnicity, culture, socioeconomic status, and other individual differences (see Research in Action for one example).

## FERTILIZATION

Fertilization, or conception, is the process by which sperm and ovum—the male and female gametes, or sex cells—combine to create a single cell called a **zygote**, which then duplicates itself again and again by cell division to produce all the cells that make up a baby. The “fertile window”—the time during which conception is possible—is

### fertilization

Union of sperm and ovum to produce a zygote; also called conception.

### zygote

One-celled organism resulting from fertilization.

# research in action

## INDIGENOUS MOTHERHOOD

Annette's hands shake as she paces in the bathroom, waiting for the results of her pregnancy test. A million thoughts run through her head as she tries to imagine the ways in which her future might change from this moment forward. She closes her eyes and pictures the broad sky and copper sands of her home in Tuba City, Arizona. This moment of uncertainty and stress makes her ache with awareness of how far away she is from Navajo Nation.

Motherhood is always a time of change, but modern indigenous motherhood has been further transformed by traumatic historical events, including forced displacement and sterilization, residential schools, and marginalization (Palacios & Portillo, 2009). As a young indigenous woman looking down at a positive pregnancy test, Annette might feel a conflict between her personal cultural values and the values of the dominant culture. Within American Indian communities, motherhood is often seen as a cause for celebration, regardless of the age of the mother. This is in direct conflict with the cultural attitudes in the United States that teen motherhood is bad and, further, the perception of indigenous teen pregnancies as a derogative stereotype (Palacios et al., 2012).

Pregnancy often leads to shifts in identity for women as they adjust to their changing bodies and roles (Hodgkinson et al., 2014). Research indicates that this process is more central to the experience of Native American motherhood. Indigenous women often report a sense of responsibility for upholding and perpetuating their culture (Schultz & Noyes, 2020). Blood quantum, or the "amount" of Native American ancestry an individual has, can play a significant role in a person's ability to become a member of their tribe and receive tribal benefits. Native American women report

that the blood quantum of their future children can even influence who they choose to date (Schultz & Noyes, 2020).

Adoption, sometimes offered as an option for unintended teen pregnancies, is a difficult choice for any woman. However, for indigenous women, it is also a path fraught with historical trauma. Between the violence of residential schools and the kidnapping of American Indian children into foster care, it is understandable that women such as Annette might feel cautious about choosing adoption. American Indian adoptees are often placed with non-Native families and experience higher rates of substance use, eating disorders, and suicidal ideation in adulthood (Landers et al., 2017). In response to these historical traumas, the Indian Child Welfare Act (ICWA) of 1978 was designed to ensure that Native American families receive preference when a Native American adoptee is up for placement. Despite this, legal challenges to ICWA have been increasing (Reid, 2020).

Becoming a parent is a momentous occasion under any circumstances. However, indigenous women must navigate not only the typical changes that come with motherhood but also the integration of their cultural beliefs with the often clashing majority cultural system.



Do you think that people should have to verify blood quantum in order to enroll in a tribe?

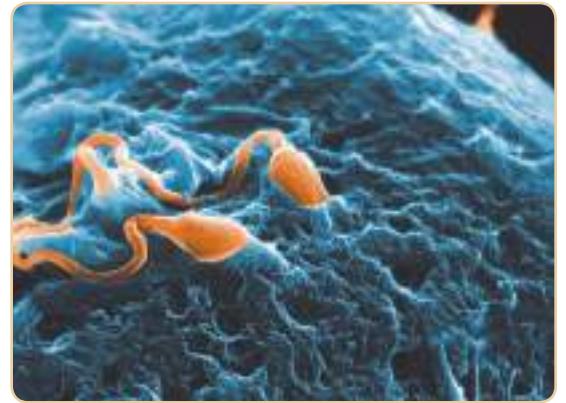
Do you think it is better for a child to remain in foster care if a Native family cannot be found to adopt them, or should they be placed with a non-Native family?

**highly unpredictable** (Ecochard et al., 2015). Although conception is far more likely at certain times, a woman may or may not conceive at any time during the month.

At birth, a girl is believed to have about 2 million immature ova in her two ovaries, each ovum in its own follicle, or small sac. In a sexually mature woman, ovulation—rupture of a mature follicle in either ovary and expulsion of its ovum—occurs about once every 28 days until menopause. The ovum is swept along through one of the fallopian tubes by the cilia, tiny hair cells, toward the uterus, or womb.

Sperm are produced in the testicles (testes), or reproductive glands, of a mature male at a rate of several hundred million a day and are ejaculated in the semen at sexual climax. Deposited in the vagina, they try to swim through the cervix, the opening of the uterus, and into the fallopian tubes, but only a tiny fraction make it that far.

Fertilization normally occurs while the ovum is passing through the fallopian tube. If fertilization does not occur, the ovum and any sperm cells in the woman's body die. The sperm are absorbed by the woman's white blood cells, and the ovum passes through the uterus and exits through the vagina.



## ASSISTED REPRODUCTIVE TECHNOLOGIES

Approximately 80 percent of reproductively aged couples will experience a conception in the first 6 months of unprotected sex. If after 4 years a conception is not experienced, couples are extremely unlikely to have a child without assistance (Vander Borght & Wyns, 2018). For couples struggling with infertility, science offers several alternative ways to parenthood.

**Assisted reproductive technology (ART)**, or conception through artificial means, provides couples having difficulty conceiving naturally with a means to augment their fertility. Although success rates have improved, only 23.6 percent of any single trial of ART resulted in a successful pregnancy in 2019 (Centers for Disease Control and Prevention, 2021). Nonetheless, since it was first tested in 1978, estimates are that approximately 9 million children worldwide have been conceived through ART (European Society of Human Reproduction and Embryology, 2020).

The simplest form of ART is artificial insemination, in which sperm is injected into a woman's vagina, cervix, or uterus. In another common method, in vitro fertilization (IVF), a woman's ova are surgically removed, fertilized in a laboratory dish, and implanted in the woman's uterus. Success rates are low as such ova are less likely to become established in the womb. In an attempt to increase the odds of success, multiple embryos are sometimes implanted. This procedure increases the likelihood of multiple, usually premature births (Centers for Disease Control and Prevention, 2018), and is associated with increased risk for children (Qin et al., 2015). Thus, it has been argued limiting transfers to a single embryo is preferable. More recently, women have also been employing cryopreservation, or egg freezing, to extend their years of fertility. Eggs are harvested with the intention of conceiving a child at a later date with the help of IVF (Brezina & Zhao, 2012).

Internationally, the rate of single embryo transfer varies. However, a variety of regions, including the United States, Australia and New Zealand, Canada, continental Europe, the United Kingdom, Japan, and Latin America, have shown declining rates of multiple-embryo transfer (Kushnir et al., 2017) due to policies limiting the number of embryos transferred during in vitro fertilization (Blencowe et al., 2013).

This color-enhanced scanning electron micrograph (SEM) shows two sperm (orange) attracted to an ovum's blue surface. A sperm's long tail enables it to swim through the cervix and up the fallopian tube. The sperm's rounded head releases enzymes that help it penetrate the ovum's thick surface and fertilize the ovum by fusing with its nucleus.

Pascal Goetgheluck/Science Source

### assisted reproductive technology (ART)

Methods used to achieve conception through artificial means.

#### dizygotic twins

Twins conceived by the union of two different ova (or a single ovum that has split) with two different sperm cells; also called *fraternal twins*; they are no more alike genetically than any other siblings.

#### monozygotic twins

Twins resulting from the division of a single zygote after fertilization; also called *identical twins*; they are genetically similar.

### checkpoint can you...

- Provide examples of cultural beliefs about conception?
- Explain how and when fertilization normally takes place?
- Distinguish between and explain monozygotic and dizygotic twins?
- Explain why birth rates for multiples have changed over time?

## MULTIPLE BIRTHS

Global rates for multiple births vary widely: 9.1 per 1,000 births in Romania, 26.5 in Cyprus (Heino et al., 2016), and 27.2 in South Korea (Lim, 2011). Although twins are the most common variation, triplets, quadruplets, and other multiple births are possible. The risk of both preterm delivery and low birth weight increases rapidly with the number of babies being carried, approaching 100 percent for quadruplets (Martin et al., 2019).

**Dizygotic twins**, or fraternal twins, are the result of two separate eggs being fertilized by two different sperm to form two unique individuals. Genetically, they are like siblings who inhabit the same womb at the same time, and they can be the same or different sex. Dizygotic twins tend to run in families and are the result of multiple eggs being released at one time. This tendency has a genetic basis (Boomsma, 2020).

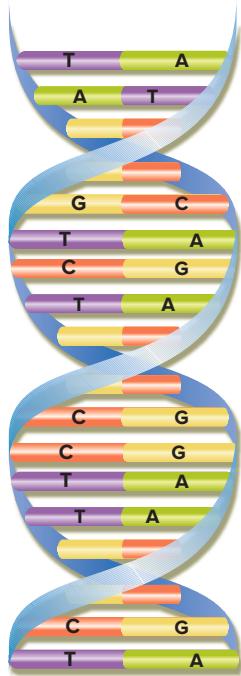
**Monozygotic twins** are the result of a far different process. They result from the cleaving of one fertilized egg and are generally genetically identical. They can still differ outwardly, however, because people are the result of the interaction between genes and environmental influences.

The rate of monozygotic twins (slightly under 4 per 1,000 live births) appears to be constant across time and place, but the rate of dizygotic twins, the more common

DNA is the genetic material in all living cells. It consists of four chemical units, called bases. These bases are the letters of the DNA alphabet. A (adenine) pairs with T (thymine) and C (cytosine) pairs with G (guanine). There are 3 billion base pairs in human DNA.

Letters of the DNA alphabet

T = Thymine  
A = Adenine  
G = Guanine  
C = Cytosine



**FIGURE 1**  
**DNA: The Genetic Code**

Source: Adapted from Ritter (1999).

type, varies (Smits & Monden, 2011). For example, multiple birth rates in West African women have been reported at 1 in 40, while rates in Japan are far lower at 1 in 200 (Blencowe et al., 2013). Influences on multiple births are (1) the trend toward delayed childbearing and (2) the increased use of fertility drugs, which spur ovulation, and of assisted reproductive techniques such as in vitro fertilization, which tend to be used by older women (Martinet al., 2009).

## Mechanisms of Heredity

The science of genetics is the study of heredity, the genetic transmission of heritable characteristics from biological parents to offspring.

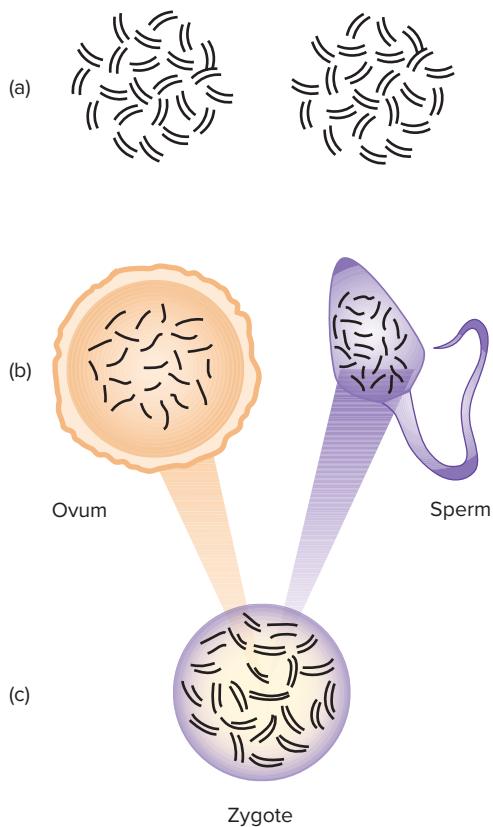
### THE GENETIC CODE

The “stuff” of heredity is a chemical called **deoxyribonucleic acid (DNA)**. The double-helix structure of a DNA molecule resembles a long, spiraling ladder whose steps are made of pairs of chemical units called bases (Figure 1). The bases—adenine (A), thymine (T), cytosine (C), and guanine (G)—are the “letters” of the **genetic code**, which cellular machinery “reads.”

**Chromosomes** are coils of DNA that consist of smaller segments called **genes**, the functional units of heredity. Each gene is located in a specific position on its chromosome and contains thousands of bases. The sequence of bases in a gene tells the cell how to make the proteins that enable it to carry out specific functions. The complete sequence of genes in the human body constitutes the **human genome**. Of course, every human has a unique genome. The human genome is not meant to be a recipe for making a particular human. Rather, the human genome is a reference point, or representative genome, that shows the location of all human genes.

A useful analogy is to consider the DNA of an individual as a series of books in a library. Until those books are “read” by an enzyme called **RNA polymerase** and transcribed into a readable copy of messenger RNA (m-RNA), the knowledge contained within the books is not actualized. And what books will be pulled down from the shelf and read is in part determined by environmental factors turning genes on and off at different points in development (Champagne & Mashoodh, 2009).

Every cell in the normal human body except the sex cells (sperm and ova) has 23 pairs of chromosomes—46 in all. Through a type of cell division called meiosis, which the sex cells undergo when they are developing, each sex cell ends up with only 23 chromosomes—one from each pair. When sperm and ovum fuse at conception, they produce a zygote with 46 chromosomes, 23 from the father and 23 from the mother (Figure 2).



**FIGURE 2**  
**Hereditary Composition of the Zygote**

(a) Body cells of women and men contain 23 pairs of chromosomes, which carry the genes, the basic units of inheritance. (b) Each sex cell (ovum and sperm) has only 23 single chromosomes because of a special kind of cell division (meiosis). (c) At fertilization, the 23 chromosomes from the sperm join the 23 from the ovum so that the zygote receives 46 chromosomes, or 23 pairs.

At conception, then, the single-celled zygote has all the biological information needed to guide its development into a unique individual. Through mitosis, a process by which the non-sex cells divide in half over and over again, the DNA replicates itself, so that each newly formed cell has the same DNA structure as all the others. Each cell division creates a genetic duplicate of the original cell, with the same hereditary information. Sometimes a mistake in copying is made, and a mutation may result. Mutations are permanent alterations in genetic material. When development is normal, each cell (except the sex cells) continues to have 46 chromosomes identical to those in the original zygote. As the cells divide, they differentiate, specializing in a variety of complex bodily functions that enable the child to grow and develop.

Genes spring into action when they are turned on or off, either by external environmental factors such as nutrition or stress, or by internal factors such as hormone levels in the mother or fetus. Thus, from the start, heredity and environment are intertwined.

## SEX DETERMINATION

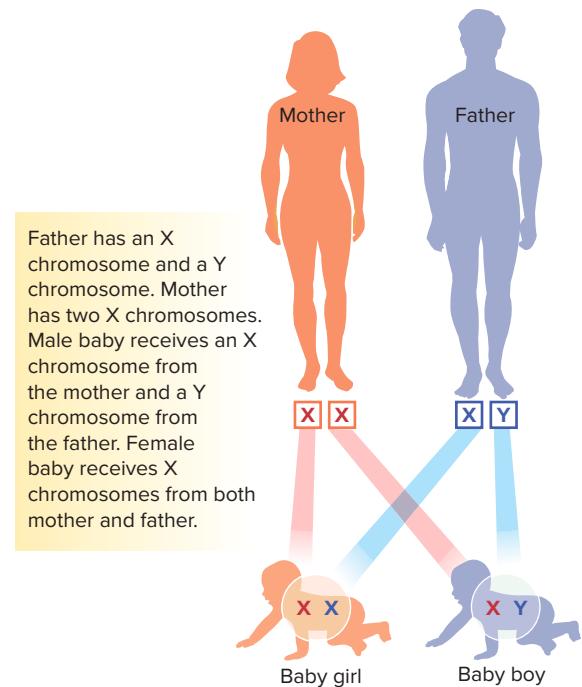
Twenty-two pairs of our 23 pairs of chromosomes are **autosomes**, chromosomes that are not related to sexual expression. The twenty-third pair are **sex chromosomes**—one from the father and one from the mother—that govern the baby's sex.

Sex chromosomes are either X chromosomes or Y chromosomes. The sex chromosome of every ovum is an X chromosome, but the sperm may contain either an X or a Y chromosome. The Y chromosome contains the gene for maleness, called the SRY gene. When an ovum (X) is fertilized by an X-carrying sperm, the zygote formed is XX, a genetic female. When an ovum (X) is fertilized by a Y-carrying sperm, the resulting zygote is XY, a genetic male (Figure 3).

Sexual differentiation is a more complex process than simple gene determination. Early in development, the embryo's rudimentary reproductive system appears almost identical in males and in females. Research with mice has found that once hormones signal the SRY gene on the Y chromosome to turn on, cell differentiation and formation of the testes are triggered. At 6 to 8 weeks after conception, the testes start to produce the male hormone testosterone. Exposure of a genetically male embryo to steady, high levels of testosterone ordinarily results in the development of a male body with male sexual organs (Arnold, 2017). Without this hormonal influence, a genetically male mouse will develop genitals that appear female rather than male.

The development of the female reproductive system is equally complex and depends on a number of genetic variants. These variants promote ovarian development and inhibit testicular development (Ono & Harley, 2013). This includes the HOX genes (Taylor, 2000) and a

*The Neanderthal genome was sequenced in 2013, and analysis of the commonalities between Neanderthal and human genes suggests that we engaged in limited interbreeding. In other words, some of their genes live on in us. Indeed, estimates are that only 1.5 to 7 percent of the human genome is uniquely human (Schaefer et al., 2021).*



**FIGURE 3**

### Genetic Determination of Sex

Because all babies receive an X chromosome from the mother, sex is determined by whether an X or a Y chromosome is received from the father.

**deoxyribonucleic acid (DNA)**

Chemical that carries inherited instructions for the development of all cellular forms of life.

**genetic code**

Sequence of bases within the DNA molecule; governs the formation of proteins that determine the structure and functions of living cells.

**chromosomes**

Coils of DNA that consist of genes.

**genes**

Small segments of DNA located in definite positions on particular chromosomes; functional units of heredity.

**human genome**

Complete sequence of genes in the human body.

**mutations**

Permanent alterations in genes or chromosomes that may produce harmful characteristics.

**autosomes**

In humans, the 22 pairs of chromosomes not related to sexual expression.

**sex chromosomes**

Pair of chromosomes that determines sex: XX in the normal human female, XY in the normal human male.

## checkpoint can you ...

- Describe the structure of DNA and its role in the inheritance of characteristics?
- Distinguish between meiosis and mitosis?
- Explain why the sperm normally determines a baby's sex?

### alleles

Two or more alternative forms of a gene that occupy the same position on paired chromosomes and affect the same trait.

### homozygous

Possessing two identical alleles for a trait.

### heterozygous

Possessing differing alleles for a trait.

### dominant inheritance

Pattern of inheritance in which, when a child receives different alleles, only the dominant one is expressed.

### recessive inheritance

Pattern of inheritance in which a child receives identical recessive alleles, resulting in expression of a nondominant trait.

### FIGURE 4

## Dominant and Recessive Inheritance

*Because of dominant inheritance, the same observable phenotype (in this case, brown hair) can result from two different genotypes (RR and Rr). A phenotype expressing a recessive characteristic (such as red hair) must have a homozygous recessive genotype (rr).*

(Left to Right) Dougal Waters/Photodisc/Getty Images; Ioannis Pantzi/Shutterstock; Ed-Imaging; Ed-Imaging; BDLM/Cultura/Getty Images; Pete Pahham/Shutterstock

signaling molecule called Wnt-4, a variant form of which can masculinize a genetically female fetus (Bouty et al., 2020).

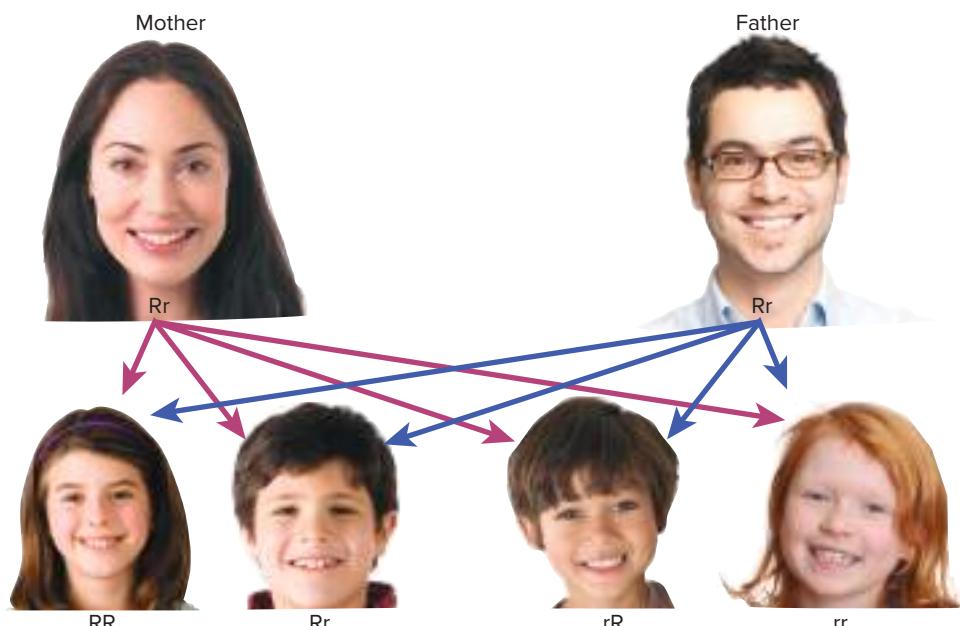
## PATTERNS OF GENETIC TRANSMISSION

During the 1860s, Gregor Mendel, an Austrian monk, laid the foundation for our understanding of patterns of inheritance. By crossbreeding strains of peas, he discovered two fundamental principles of genetics. First, traits could be either dominant or recessive. Dominant traits are always expressed, whereas recessive traits are expressed only if both copies of the gene are recessive. Second, traits are passed down independently of each other. For example, the color of your hair and your height are both heritable traits that are not linked.

Although some human traits are inherited via simple dominant transmission, most human traits fall along a continuous spectrum and result from the actions of many genes in concert. Nonetheless, Mendel's groundbreaking work laid the foundations for our modern understanding of genetics.

**Dominant and Recessive Inheritance** Genes that can produce alternative expressions of a characteristic (such as the presence or absence of dimples) are called **alleles**. Alleles are alternate versions of the same gene. Every person receives one maternal and one paternal allele for any given trait. When both alleles are the same, the person is **homozygous** for the characteristic; when they are different, the person is **heterozygous**. In **dominant inheritance**, the dominant allele is always expressed, or shows up as a trait in that person. The person will look the same whether or not he or she is heterozygous or homozygous because the recessive allele doesn't show. For the trait to be expressed in **recessive inheritance**, the person must have two recessive alleles, one from each parent. If a recessive trait is expressed, that person cannot have a dominant allele.

Let's take red hair as an example. Because red hair is a recessive trait, you must receive two recessive copies (*r*) of the gene—one from each parent—in order to express red hair. Having hair that is not red (*R*; brown in this example) is a dominant trait, so you will have brown hair if you receive at least one copy (*R*) from either parent (*Rr* or *RR*) (Figure 4). If you receive one copy of the red hair allele (*r*) and one copy of an allele for brown hair (*R*), you are heterozygous (*Rr* or *rR*); if you have two copies of the allele for brown hair, you are homozygous dominant (*RR*). In both cases, you will have brown hair. If you inherited one allele for red hair from each parent, you are homozygous



recessive for this trait (rr) and will have red hair. Thus, the only situation in which you would have red hair is if you received two recessive copies (r), one from each parent.

Relatively few traits are determined in this simple fashion. Most traits result from **polygenic inheritance**, the interaction of several genes. For example, there is not an “intelligence” gene that determines whether or not you are smart. Rather, a large number of genes work in concert to determine your intellectual potential. Like intelligence, most individual variations in complex behaviors or traits are governed by the additive influences of many genes with small but identifiable effects. Although single genes often determine abnormal traits, there is no single gene that by itself significantly accounts for individual differences in any complex behavior.

**Multifactorial Transmission** If you have brown hair, that is part of your **phenotype**, the observable characteristics through which your **genotype**, or underlying genetic makeup, is expressed. The phenotype is the product of the genotype and any relevant environmental influences. The difference between genotype and phenotype helps explain why a clone (a genetic copy of an individual) or even an identical twin can never be an exact duplicate of another person.

As Figure 4 illustrates, people with different genotypes may exhibit the same phenotype. For example, a child who is homozygous for a dominant brown hair allele will have brown hair, but so will a child who is heterozygous for that same allele. Because it is dominant, the brown hair is expressed, and the recessive red hair allele is hidden.

Environmental experience modifies the expression of the genotype for most traits—a phenomenon called **multifactorial transmission**. Multifactorial transmission illustrates the interaction of nature and nurture and how they affect outcomes. Imagine that Rio has inherited athletic talent and comes from a family of avid athletes. If his family nurtures his talent and he practices regularly, he may become a skilled athlete. However, if he is not encouraged or not motivated to engage in athletics, his genotype for athletic ability may not be expressed (or may be expressed to a lesser extent) in his phenotype. Some physical characteristics (including height and weight) and most psychological characteristics (such as intelligence and musical ability) are products of multifactorial transmission. Many disorders (such as attention-deficit/hyperactivity disorder) arise when an inherited predisposition (an abnormal variant of a normal gene) interacts with an environmental factor, either before or after birth (Yang et al., 2013).

**Epigenetic Influences on Gene Expression** Have you ever wondered why identical twins—who share 100 percent of their genetic code—look and act slightly different? Epigenetic variation can help explain this. The field of epigenetics includes the study of biochemical modifications of genetic expression “above the genome”—without altering DNA sequence. The differences arise as certain genes are turned off or on as they are needed by the developing body or when triggered by the environment. This phenomenon is called **epigenesis**, or epigenetics.

Epigenesis works via chemical molecules, or “tags,” attached to a gene that affect the way a cell “reads” the gene’s DNA. Because every cell in the body inherits the same DNA sequence, the function of the chemical tags is to differentiate various types of body cells, such as brain cells, skin cells, and liver cells—somewhat like placing sticky notes in your textbook to tell you where to look for information. These tags work by switching particular genes on or off during embryonic formation.

Environmental factors, such as nutrition, smoking, sleep habits, stress, and physical activity, can cause epigenetic changes (Wong et al., 2014). In turn these epigenetic changes can contribute to such common ailments as cancer, diabetes, and heart disease (Biswas & Rao, 2018; Ling & Rönn, 2019; Prasher et al., 2020). It may explain why one monozygotic twin is susceptible to a disease such as schizophrenia whereas the other twin is not and why some twins get the same disease but at different ages (Demir & Demir, 2018). Environmental influences can also be social in nature. For example, childhood adversity can lead to a variety of health vulnerabilities, including cardiovascular disease,

#### polygenic inheritance

Pattern of inheritance in which multiple genes at different sites on chromosomes affect a complex trait.

#### phenotype

Observable characteristics of a person.

#### genotype

Genetic makeup of a person, containing both expressed and unexpressed characteristics.



Your genotype is the recipe for making you. Your phenotype is how you actually turn out.

#### multifactorial transmission

Combination of genetic and environmental factors to produce certain complex traits.

#### epigenesis

Mechanism that turns genes on or off and determines functions of body cells.



Identical twins can usually open each other's phones with facial recognition. However, because every person—even identical twins—has unique fingerprints (Tao et al., 2012), they cannot open each other's phones with a fingerprint scanner.



*Epigenetic changes can explain why identical twins look increasingly divergent with age.*

LPETTET/E+/Getty Images

## checkpoint can you... ...

- Explain how epigenesis and genome imprinting occur, and give examples?

decreased immune responses, and an increased risk of psychological disorders (Pierce et al., 2020; Berens et al., 2017).

Cells are particularly susceptible to epigenetic modification during critical periods such as pregnancy (Naffee et al., 2008). Furthermore, epigenetic modifications, especially those that occur early in life, may be heritable. For example, the granddaughters of women and the grandsons of men who experienced famine while in the womb lived shorter lives on average (Pembrey et al., 2014).

## GENETIC AND CHROMOSOMAL ABNORMALITIES

Most birth disorders are fairly rare (see Table 1), affecting only about 3 percent of live births (Centers for Disease Control and Prevention, 2020). Nevertheless, they are the leading cause of infant death in the United States, accounting for 21 percent of infant deaths (Ely & Driscoll, 2020). The most prevalent defects

are clubfoot, cleft palate, Down syndrome, and heart defects, in that order (Mai et al., 2019).

Rates of disorders vary with race and ethnicity. For example, Asian/Pacific Islander infants have the lowest prevalence of anencephaly, a variety of heart and aortal defects, clubfoot, gastrointestinal abnormalities, limb defects, and spina bifida. Hispanic and American Indian/Alaska native infants, by contrast, have among the highest rates of these defects. Non-Hispanic Black infants have higher rates of omphalocele (a birth defect in the abdominal wall) and trisomy-13 (Mai et al., 2019). Survival rates also differ by ethnicity. In particular, African American and Hispanic infants are at higher risk than White, non-Hispanic infants (Wang et al., 2015).

Not all genetic or chromosomal abnormalities are apparent at birth. Tay-Sachs, a fatal degenerative disease of the central nervous system, and sickle-cell anemia, a blood disorder, do not generally appear until at least 6 months of age. Likewise, cystic fibrosis, a condition in which excess mucus accumulates in the lungs and digestive tract, may not appear until age 4. Some diseases show an even later onset, such as glaucoma, a disease in which fluid pressure builds up in the eyes, and Huntington's disease, a progressive degeneration of the nervous system, which do not typically appear before middle age.

It is in genetic defects and diseases that we see most clearly the operation of dominant and recessive transmission, as well as of a variation, sex-linked inheritance, discussed in the section on Sex-Linked Inheritance of Defects.

**Dominant or Recessive Inheritance of Defects** Most of the time, typical genes are dominant over those carrying abnormal traits, but sometimes the gene for an abnormal trait is dominant. When this is the case, even one copy of the "bad" gene will result in a child expressing the disorder. Among the 1,800 disorders known to be transmitted by dominant inheritance are achondroplasia (a type of dwarfism) and Huntington's disease. Defects transmitted by dominant inheritance are less likely to be lethal at an early age than those transmitted by recessive inheritance because any affected children would be likely to die before reproducing. Therefore, that gene would not be passed on to the next generation and would soon disappear from the population.

Recessive defects are expressed only if the child is homozygous for that gene; in other words, a child must inherit a copy of the recessive gene from each parent. Because recessive genes are not expressed if the parent is heterozygous for that trait, it may not always be apparent that a child is at risk for receiving two alleles of a recessive gene. Defects transmitted by recessive genes tend to be lethal at an earlier age, in contrast to those transmitted by dominant genes, because recessive genes can be transmitted by heterozygous carriers who do not themselves have the disorder. Thus, they are able to reproduce and pass the genes down to the next generation.

Normally the presence of a dominant/recessive gene pair results in the full expression of the dominant gene and the masking of the recessive gene. However, in

**TABLE 1** Some Birth Defects and Genetic Disorders

Problem	Characteristics of Condition	Who Is at Risk	What Can Be Done
<b>Alpha thalassemia</b>	Severe anemia that reduces ability of the blood to carry oxygen; nearly all affected infants are stillborn or die soon after birth	Primarily families of Malaysian, African, and Southeast Asian descent	Frequent blood transfusions
<b>Beta thalassemia (Cooley's anemia)</b>	Severe anemia resulting in weakness, fatigue, and frequent illness; usually fatal in adolescence or young adulthood	Primarily families of Mediterranean descent	Frequent blood transfusions
<b>Cystic fibrosis</b>	Overproduction of mucus, which collects in the lung and digestive tract; children do not grow normally; short life span; the most common inherited lethal defect among White people	1 in 2,000 White births	Physical therapy to loosen mucus; antibiotics for lung infections; enzymes to improve digestion; lung transplant
<b>Duchenne muscular dystrophy</b>	Fatal disease usually found in males, marked by muscle weakness and minor intellectual disability; respiratory failure and death usually occur in young adulthood	1 in 3,000 to 5,000 male births	No treatment
<b>Hemophilia</b>	Excessive bleeding, usually affecting males; in its most severe form, can lead to crippling arthritis in adulthood	1 in 10,000 families with a history of hemophilia	Frequent transfusions of blood with clotting factors
<b>Anencephaly</b>	Absence of brain tissues; infants are stillborn or die soon after birth	1 in 1,000	No treatment
<b>Spina bifida</b>	Incompletely closed spinal canal, muscle weakness or paralysis, and loss of bladder and bowel control; often accompanied by hydrocephalus, an accumulation of spinal fluid in the brain, and intellectual disability	1 in 1,000	Surgery prevents further injury; shunt placed in brain drains excess fluid.
<b>Phenylketonuria (PKU)</b>	Metabolic disorder resulting in intellectual disability	1 in 15,000 births	Special diet can prevent intellectual disability
<b>Polycystic kidney disease</b>	<i>Infantile form:</i> enlarged kidneys, leading to respiratory problems and congestive heart failure. <i>Adult form:</i> kidney pain, kidney stones, and hypertension resulting in chronic kidney failure	1 in 1,000	Kidney transplants
<b>Sickle-cell anemia</b>	Deformed red blood cells that clog blood vessels, depriving the body of oxygen; symptoms include severe pain, stunted growth, infections, leg ulcers, gallstones, pneumonia, and stroke	1 in 500 African Americans	Painkillers, transfusions for anemia and to prevent stroke, antibiotics for infections
<b>Tay-Sachs disease</b>	Degenerative disease of the brain and nerve cells, resulting in death before age 5	Primarily found in Eastern European Jewish families	No treatment

Sources: Adapted from Centers for Disease Control and Prevention (2021) and Ross et al. (2013).

**incomplete dominance**, the resulting phenotype is a combination of both genes. For example, people with only one sickle-cell allele and one “good” allele do not have sickle-cell anemia with its distinctive, abnormally shaped blood cells. Their blood cells are not the typical round shape either. They are an intermediate shape, which shows that the sickle-cell gene for these people is incompletely dominant.

#### incomplete dominance

Pattern of inheritance in which a child receives two different alleles, resulting in partial expression of a trait.

### sex-linked inheritance

Pattern of inheritance in which certain characteristics carried on the X chromosome inherited from the mother are transmitted differently to her male and female offspring.

Children with Turner syndrome have only one X chromosome, are missing the second sex chromosome, and are always girls. Because so little information is carried on the Y chromosome, an embryo with only a Y chromosome and no X chromosome is not viable. Alternatively, an embryo with only an X chromosome but no Y often is.



**Sex-Linked Inheritance of Defects** In sex-linked inheritance (Figure 5), certain recessive disorders affect male and female children differently. This is due to the fact that males are XY and females are XX. In humans, the Y chromosome is smaller and carries far fewer genes than the X chromosome. One outcome of this is that males receive only one copy of any gene that happens to be carried on the sex chromosomes, whereas females receive two copies. So, if a woman has a “bad” copy of a particular gene, she has a backup copy. However, if a male has a “bad” copy of a particular gene, that gene will be expressed.

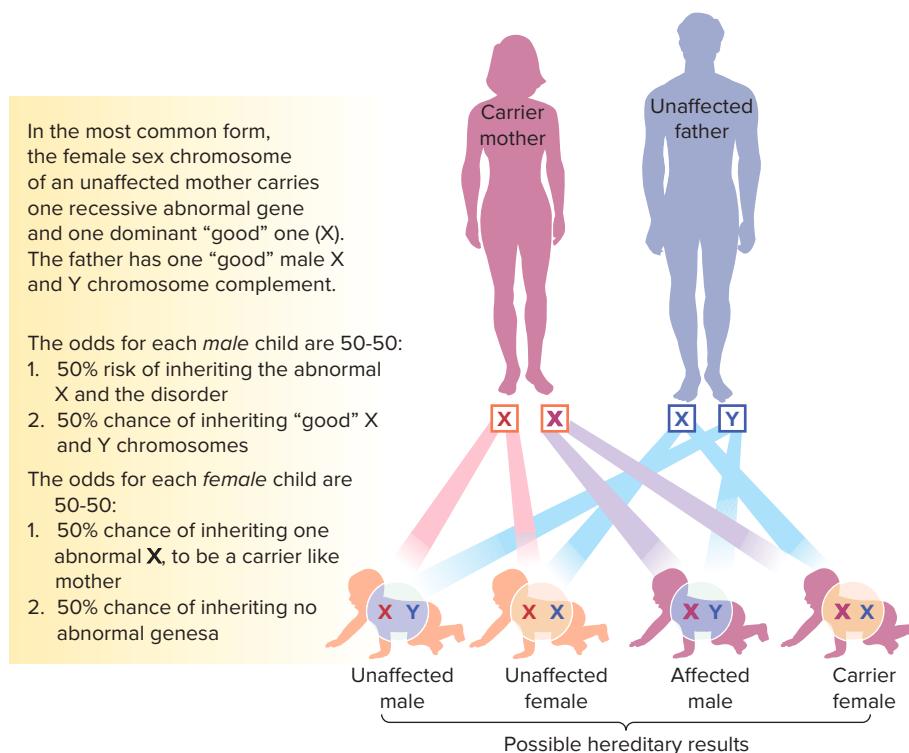
Heterozygote females who carry one “bad” copy of a recessive gene and one “good” one are called carriers. If such a woman has children with an unaffected male (a man who has a “good” copy of the gene), she has a 50 percent chance of passing the disorder on to any sons they might have. If they have a son (who is XY by virtue of being male), the father contributed a Y chromosome, and the mother contributed the X chromosome. Because she has one “good” copy and one “bad” copy, either outcome is equally likely. Daughters (who are XX by virtue of being female) may be protected because the father will pass on his “good” copy to daughters, so the girls have a 50 percent chance either of being completely unaffected or of carrying a hidden recessive copy of the gene.

Sex-linked recessive disorders are more common in males than in females. For example, red-green color blindness, hemophilia (a disorder in which blood does not clot when it should), and Duchenne muscular dystrophy (a disorder that results in muscle degeneration and eventually death) are all more common in males, and all result from genes located on the X chromosome. Occasionally, a female does inherit a sex-linked condition. For this to happen, the father must have a “bad” copy, and the mother must also be a carrier or herself have the condition.

### Chromosomal Abnormalities

Chromosomal abnormalities typically occur because of errors in cell division, resulting in an extra or missing chromosome. For example, Klinefelter syndrome is caused by an extra female sex chromosome (shown by the pattern XXY). Turner syndrome results

**FIGURE 5**  
Sex-Linked Inheritance



**TABLE 2** Sex Chromosome Abnormalities

Pattern/Name	Typical Characteristics*	Incidence	Treatment
<b>XYY</b>	Male; tall stature; tendency toward low IQ, especially verbal	1 in 1,000 male births	No special treatment
<b>XXX (triple X)</b>	Female; normal appearance, menstrual irregularities, learning disorders, intellectual disability	1 in 1,000 female births	Special education
<b>XXY (Klinefelter)</b>	Male; sterility, underdeveloped secondary sex characteristics, small testes, learning disorders	1 in 1,000 male births	Hormone therapy, special education
<b>XO (Turner)</b>	Female; short stature, webbed neck, impaired spatial abilities, no menstruation, infertility, underdeveloped sex organs	1 in 1,500 to 2,500 female births	Hormone therapy, special education
<b>Fragile X</b>	Minor-to-severe intellectual disability more severe in males; delayed speech and motor development, hyperactivity; the most common <i>inherited</i> form of intellectual disability	1 in 1,200 male births; 1 in 2,000 female births	Educational and behavioral therapies when needed

\*Not every affected person has every characteristic.

from a missing sex chromosome (XO). The likelihood of errors increase in offspring of women age 35 or older. Characteristics of the most common sex chromosome disorders are shown in Table 2.

**Down syndrome**, the most common chromosomal abnormality, accounts for about 40 percent of all cases of moderate-to-severe intellectual disability (Pennington et al., 2003). The condition is also called trisomy-21 because it is characterized in more than 90 percent of cases by an extra 21st chromosome.

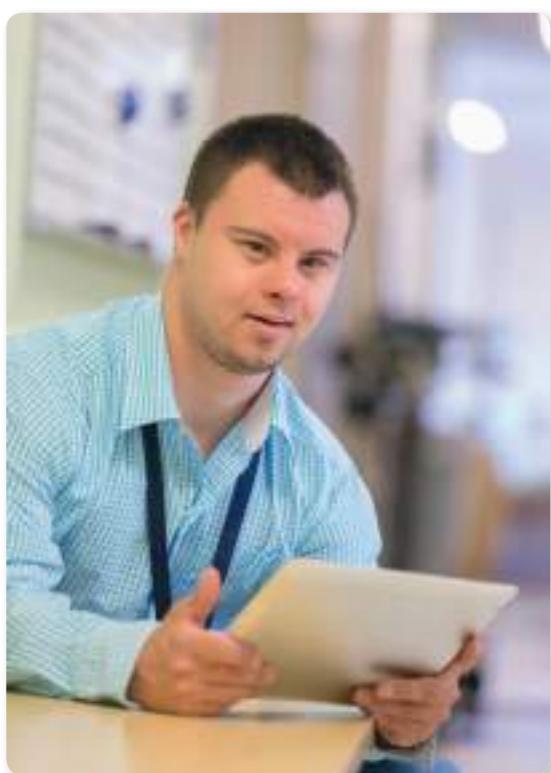
Slightly over one of every 700 live births is a child with Down syndrome (Mai et al., 2019). Although the risk of having a child with Down syndrome rises with age, because of the higher birthrates of younger women, more young mothers have children with Down syndrome (Centers for Disease Control and Prevention, 2021). Research also shows having a father less than 20 or over 40 years old increases the risk (Fang et al., 2020). Additionally, parents who have had one child with Down syndrome are at increased risk for having another child with Down syndrome (Davidson, 2008).

Between 1979 and 2003, an increased tendency to delay child rearing and thus a greater number of older mothers resulted in a corresponding increase in the number of children born with Down syndrome (Shin et al., 2009). However, this trend was offset by the development of noninvasive prenatal screening tests in 2011, which allowed pregnant women to test for genetic disorders without risk of miscarriage. Estimates are that approximately 30 percent of pregnancies in which Down syndrome was diagnosed were electively terminated (de Graaf et al., 2015).

Children with Down syndrome, like other children with disabilities, tend to benefit cognitively, socially, and emotionally when provided with regular, intensive therapies designed to help them achieve important skills (Smith et al., 2020; Ruiz-González et al., 2019; Lukowski et al., 2019). As adults, many live in small group homes and support themselves; they tend to do well in structured job situations. Because of increases in the average life span, there now exists a much wider range of ages in the US population of people with Down syndrome than used to be the case (de Graaf et al., 2015). Still, a recent international meta-

#### Down syndrome

Chromosomal disorder characterized by moderate-to-severe intellectual disability and by such physical signs as a downward-sloping skin fold at the inner corners of the eyes. Also called *trisomy-21*.



Although Down syndrome is a major cause of intellectual disability, people with this chromosomal abnormality can live happy, productive lives.

Disability Images/Blend Images LLC

Another common sign of Down syndrome involves the lines that palm readers use to tell your fortune. In children with Down syndrome, there is a single horizontal line across the palm.



#### genetic counseling

Clinical service that advises prospective parents of their probable risk of having children with hereditary defects.

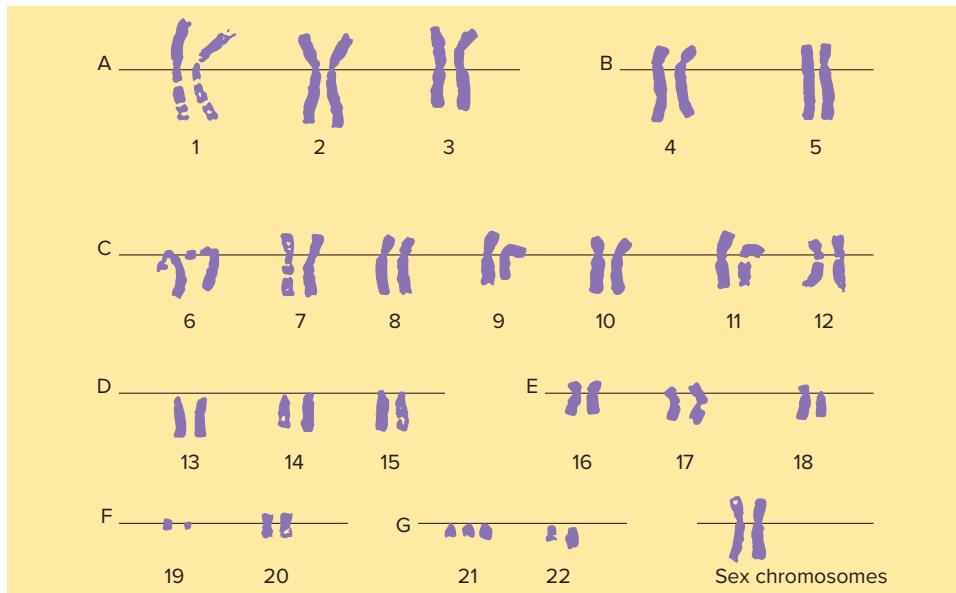
analysis of 34 studies indicated that, across a variety of countries, people with Down syndrome live about 28 fewer years than the general population (O'Leary et al., 2018).

## GENETIC COUNSELING AND TESTING

**Genetic counseling** can help prospective parents assess their risk of bearing children with genetic or chromosomal defects. People who have already had a child with a genetic defect, who have a family history of hereditary illness, who suffer from conditions known or suspected to be inherited, or who come from ethnic groups at higher risk of passing on genes for certain diseases can get information about the likelihood their children being affected.

A genetic counselor takes a family history and gives the prospective parents and any biological children physical examinations. Laboratory investigations of blood, skin, urine, or fingerprints may be performed. Chromosomes from body tissues may be analyzed and photographed, and the photographs enlarged and arranged according to size and structure on a chart called a karyotype. This chart can show chromosomal abnormalities and can indicate whether a person might transmit genetic defects to a child (Figure 6). The counselor tries to help clients understand the mathematical risk of a particular condition, explains its implications, and presents information about alternative courses of action.

Geneticists have made great contributions to avoidance of birth defects. For example, since so many Jewish couples have been tested for genes that carry Tay-Sachs, a fatal disease involving degeneration of mental and physical abilities, far fewer Jewish babies have been born with the disease (Zhang et al., 2019). Similarly, screening and counseling of women of childbearing age from Mediterranean countries, where beta thalassemia (refer to Table 1) is common, has brought a decline in births of affected babies and greater knowledge of the risks of being a carrier (Cao & Kan, 2013).



**FIGURE 6**

### Karyotype of a Female with Down Syndrome

A karyotype is a photograph that shows the chromosomes when they are separated and aligned for cell division. We know that this is a karyotype of a person with Down syndrome because there are three chromosomes instead of the usual two on pair 21. Because pair 23 consists of two Xs, we know that this is the karyotype of a female.

Sources: Babu & Hirschhorn (1992); March of Dimes Birth Defects Foundation (1987).

### checkpoint can you... ?

- Explain the operation of dominant inheritance, recessive inheritance, incomplete dominance, sex-linked inheritance, and mutations in transmission of birth defects?
- Explain the purposes of genetic counseling?

# Studying the Influences of Heredity and Environment

Today it has become clear that, although certain rare physical disorders are virtually 100 percent inherited, phenotypes for most traits, such as those having to do with intelligence and personality, are subject to a complex array of hereditary and environmental forces.

## MEASURING HERITABILITY

One approach to the study of heredity and environment is quantitative: It seeks to measure how much heredity and environment influence particular traits. This is the traditional goal of the science of **behavioral genetics**.

Behavioral geneticists have developed a means of estimating how much of a trait is due to genetics and how much is the result of environmental influences by using a concept known as **heritability**. Every trait is a consequence of genes and environment. By looking at groups of people with known genetic relationships and assessing whether or not they are **concordant**, or the same, on a given trait, behavioral geneticists can estimate the relative influence of genes and environment.

Heritability cannot be measured directly. Thus, researchers in behavioral genetics have developed indirect methods for assessing the relationship between the expression of traits and the genetic and environmental factors influencing them. Although there are variations in the details, the underlying logic of the approaches in these types of studies is the same.

If two people are unrelated, we know they are not likely to share any genes. If two people are identical twins, we know they share all their genes. If two people are fraternal twins, siblings, or parent and child, they share roughly 50 percent of their genes with each other. And, if we know, on average, how many genes people share, then we can measure how similar they are on traits (that is, their concordance rate) and work backward to determine the relative environmental influences. Therefore, if heredity has a large influence on a particular trait, identical twins should be more alike on that trait than fraternal twins, and adopted children should be more like their biological parents than their adoptive parents. Note that this can be carried out to more distant genetic relatives as well. For traits with strong genetic influences, for example, siblings should be more similar than cousins on that trait.

We can also use the environment to estimate influences. If the environment exerts a large influence on a trait, people who live together should be more similar than those that live apart, and shared genes should matter less. For example, in this situation, we might compare adopted children to their biological and adoptive parents. If adopted children are more similar to their adoptive parents than their biological parents on a trait, then that trait is likely influenced strongly by the environment.

Essentially, this approach boils down to comparisons of shared genes, the same or different environments, and concordance rates. Using these three variables allows researchers to make an estimate of the relative influence of genes and environment on a trait. Different variations of this basic approach are used. In family studies, researchers measure the degree to which biological relatives share certain traits and determine whether or not the closeness of the familial relationship is associated with the degree of similarity. Adoption studies look at similarities between adopted children and their adoptive families and also between adopted children and their biological families. Twin studies compare pairs of monozygotic, or identical, twins with same-sex dizygotic, or fraternal, twins.

Heritability is expressed as a percentage ranging from 0.0 to 1.0: the higher the number, the greater the heritability of a trait. A heritability estimate of 1.0 indicates that genes are 100 percent responsible for variances in the trait within the population. A heritability estimate of 0.0 percent would indicate the environment shaped a trait

### behavioral genetics

Quantitative study of relative hereditary and environmental influences on behavior.

### heritability

Statistical estimate of contribution of heredity to individual differences in a specific trait within a given population.

### concordant

Term describing tendency of twins to share the same trait or disorder.



*Keep in mind that a high heritability estimate does not mean that a trait cannot be influenced by environment. If the environment changes, the heritability estimate may change as well.*

## checkpoint can you ...

- State the basic assumption underlying studies of behavioral genetics and how it applies to family, twin, and adoption studies?

### reaction range

Potential variability, depending on environmental conditions, in the expression of a hereditary trait.

### canalization

Limitation on variance of expression of certain inherited characteristics.

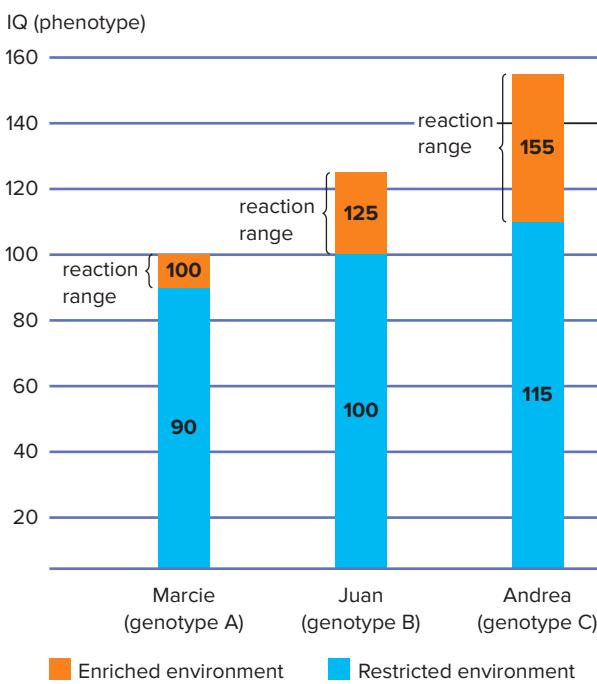


FIGURE 7

### Intelligence and Reaction Range

Children with different genotypes for intelligence will show varying reaction ranges when exposed to a restricted (blue portion of bar) or enriched (entire bar) environment.

exclusively. Note that heritability does not refer to the influences that shaped any one particular person because those influences are virtually impossible to separate. Nor does heritability tell us how traits develop. It merely indicates the statistical extent to which genes contribute to a trait at a certain time within a given population.

## HOW HEREDITY AND THE ENVIRONMENT WORK TOGETHER

Today many developmental scientists see heredity and environment as fundamentally intertwined. From conception on, throughout life, a combination of constitutional factors (related to biological and psychological makeup) and social, economic, and cultural factors help shape development.

**Reaction Range** Many characteristics vary, within limits, under varying hereditary or environmental conditions. The concept of reaction range can help us visualize how this happens.

**Reaction range** refers to a range of potential expressions of a hereditary trait. Body size, for example, depends largely on biological processes, which are genetically regulated. Tall people have tall children, and short people have short children. Even so, a range of sizes is possible. In societies in which nutrition has dramatically improved, an entire generation has grown up to tower over the generation before. The better-fed children share their parents' genes but have responded to a healthier world. Ultimately, height has genetic limits. We don't see typically developing people who are only 1 foot tall or 10 feet tall.

Heredity can influence whether a reaction range is wide or narrow. In other words, the genotype places limits on the range of possible phenotypes. For example, a child born with a defect producing mild cognitive limitations is more able to respond to a favorable environment than a child born with more severe limitations. Likewise, a child

with greater native intelligence is likely to benefit more from an enriched home and school environment than a child with a more typical level of intelligence (Figure 7).

**Canalization** Some traits have an extremely narrow range of reaction. The metaphor of **canalization** illustrates how heredity restricts the range of development for some traits. After a heavy storm, the rainwater that has fallen on a pavement has to go somewhere. If the street has potholes, the water will fill them. If deep canals have been dug along the edges of the street, the water will flow into the canals.

Highly canalized traits, such as eye color, are analogous to the deep canals. They are strongly programmed by genes, and there is little opportunity for variance in their expression. Because of the deep, genetically dug channel, it would take an extreme change in environment to alter their course. The canal is too deep for the water to easily slosh over.

Many highly canalized traits tend to be those necessary for survival. In the case of very important traits such as these, natural selection has designed them to develop in a predictable and reliable way within a variety of environments and a multitude of influences. They are too important to be left to chance. Thus, traits such as these tend to be highly canalized. With respect to motor development, typical babies follow a predictable sequence: crawling or scooting, walking, and then running, in that order, at certain approximate ages. This sequence is said to be canalized, in that children will follow this same blueprint irrespective of many variations in the environment. A similar process occurs for language. Despite differences in linguistic environments, babies the world over reach language milestones at approximately the same time and in the same order.

Cognition and personality, however, are not highly canalized. They are more subject to variations in experience. Consider reading. We are not wired to read: Natural selection has not designed us to naturally develop this skill. The environment plays a large part. Parents who play letter and word games and who read to their children are likely to have children who learn to read earlier than if these skills are not encouraged or reinforced. Children who are not taught to read do not learn to do so spontaneously.

**Genotype-Environment Interaction** Genotype-environment interaction usually refers to the effects of similar environmental conditions on genetically different individuals, and a discussion of these interactions is a way to conceptualize and talk about the different ways nature and nurture interact. To take a familiar example, many children are exposed to pollen and dust, but those with a genetic predisposition are more likely to develop allergic reactions (Sordillo et al., 2015). Interactions can work the other way as well: Genetically similar children often develop differently depending on their home environments. A child born with a difficult temperament may develop adjustment problems in one family and thrive in another, depending largely on parental handling.

**Genotype-Environment Correlation** The environment often reflects or reinforces genetic differences. This tendency is called genotype-environment correlation, and it works in three ways to strengthen the phenotypic expression of a genotypic tendency (Bergeman & Plomin, 1989). The first two ways are common among younger children, the third among older children, adolescents, and adults.

- **Passive correlations:** You not only inherit genes from your biological parents, you also inherit environments. For example, a musical parent is likely to create a home environment in which music is heard regularly, to give a child music lessons, and to take the child to musical events. If the child inherited the parent's musical talent, the child's musicality will reflect a combination of genetic and environmental influences. This type of correlation is called passive because the child does not control it. Passive correlations are most applicable to young children, whose parents have a great deal of control over their early experiences. In addition, passive correlations function only when a child is living with a biologically related parent.
- **Reactive, or evocative, correlations:** Children with differing genetic makeups evoke different reactions from others. For example, parents who are not musically inclined may make a special effort to provide musical experiences for a child who shows interest and ability in music. This response, in turn, strengthens the child's genetic inclination toward music. This type of correlation is called reactive because the other people react to the child's genetic makeup.
- **Active correlations:** As children get older and have more freedom to choose their own activities and environments, they actively select or create experiences consistent with their genetic tendencies. An adolescent with a talent for music will probably seek out musical friends, take music classes, and go to concerts if such opportunities are available. This tendency to seek out environments compatible with one's genotype is called **niche-picking**; it helps explain why identical twins reared apart tend to have similar characteristics.

**Nonshared Environmental Influences** Although two children in the same family may bear a striking physical resemblance, siblings can differ greatly in intellect and especially in personality (Plomin & Daniels, 2011). One reason may be genetic differences, which lead children to need different kinds of stimulation or to respond differently to a similar home environment. For example, one child may be more affected by family discord than another (Horowitz et al., 2010). In addition, studies in behavioral genetics suggest that many of the experiences that strongly affect development vary for different children in a family (Dunn & Plomin, 1991). Children may live in the same family, but that does not mean that their experiences are identical.



In humans, walking and talking are canalized traits. Can you think of other human physical or behavioral characteristics that might be highly canalized?

#### genotype-environment interaction

The portion of phenotypic variation that results from the reactions of genetically different individuals to similar environmental conditions.



One environmental factor that has been identified as protective against severe allergies in children is early exposure to animals (Wegienka et al., 2011).

#### genotype-environment correlation

Tendency of certain genetic and environmental influences to reinforce each other; may be passive, reactive (evocative), or active. Also called genotype-environment covariance.



Behavioral genetics research with twins and siblings shows whether we enjoy or hate exercise is genetically influenced and shows moderate heritability (Schutte et al., 2017).

#### niche-picking

Tendency of a person, especially after early childhood, to seek out environments compatible with his or her genotype.



An adolescent with artistic talent may seek out opportunities to engage in creative pursuits.

This is an example of niche-picking.

Hill Street Studios/Getty Images

#### nonshared environmental effects

The unique environment in which each child grows up, consisting of distinctive influences or influences that affect one child differently than another.

### checkpoint can you . . .

- Explain and give at least one example of reaction-range canalization and of each of the three genotype-environment correlations?
- Differentiate the three types of genotype-environment correlation?
- List three kinds of influences that contribute to nonshared environmental effects?

#### obesity

Extreme overweight in relation to age, sex, height, and body type as defined by having a body mass index at or above the 95th percentile.

These **nonshared environmental effects** result from the unique environment in which each child in a family grows up. Children in a family have a shared environment—the home they live in, the people in it, and the activities family members jointly engage in—but they also, even if they are twins, have experiences that are not shared by their brothers and sisters. Parents and siblings may treat each child differently. Certain events, such as illnesses and accidents, and experiences outside the home affect one child and not another. Despite being in the same family, the influences are not identical. Indeed, some behavioral geneticists have concluded that although heredity accounts for most of the similarity between siblings, the nonshared environment accounts for most of the difference (Hetherington et al., 2013).

We can also extend the conversation about genotype-environment correlations to explain some of the effects of the nonshared environment on siblings' experiences. Children's genetic differences may lead parents to react to them differently and treat them differently. One child may be shy and elicit more gentle behavior from parents; another may be bold and be given greater freedom and encouragement to explore. Children also mold their environments by the choices they make—what they do and with whom—and their genetic makeup influences these choices.

A child who loves to read may spend hours in solitude; an athletic and sociable child may prefer to be outside playing with others. Thus, not only will the child's talents (such as reading or athleticism) develop differently, but their social life will be different as well. These differences tend to be accentuated as children grow older and have more experiences outside the family (Plomin, 1996; Scarr, 1992).

## CHARACTERISTICS INFLUENCED BY HEREDITY AND ENVIRONMENT

Keeping in mind the complexity of unraveling the influences of heredity and environment, let's look at what is known about their roles in producing certain characteristics.

**Physical Health** The risk of developing a wide variety of medical disorders, including high blood pressure, heart disease, stroke, rheumatoid arthritis, and epilepsy, has been found to be influenced by genetics (Olczak et al., 2021; Assimes & Roberts, 2016; Dichgans et al., 2019; Okada et al., 2019; Myers et al., 2019). Life span, too, seems to be influenced by genes (Melzer et al., 2020).

**Obesity** is usually measured by body mass index, or BMI (comparison of weight to height), and is a risk factor for many negative health outcomes. Children between the 85th and 95th percentiles are classified as overweight, and those above the 95th percentile as obese. The risk of obesity is 2 to 3 times higher for a child with a family history of obesity (Bahreynian et al., 2017). Therefore, we might reasonably conclude that obesity involves genetic contributions.

Research shows that obesity is indeed affected by genetics. There is not "a" gene for obesity; rather it is a multifactorial condition. Twin studies, adoption studies, and other research suggest the heritability of obesity is 40 to 50 percent across the general population. However, heritability varies across weight status. In people who are obese, heritability estimates are 60 to 65 percent. In people who are severely obese, heritability estimates are over 80 percent (Bouchard, 2021).

However, this increased risk is not solely genetic. Environmental experiences also contribute to obesity (Willyard, 2014). The kind and amount of food eaten in a particular home and the amount of exercise that is encouraged can increase or decrease the likelihood that a child will become obese. Moreover, the wider social context is at play as well. Obesity rates rise in countries with rapid socioeconomic growth and increases in gross domestic product (Min et al., 2013). In Western countries, obesity likely stems from the interaction of a genetic predisposition with overeating, supersized portions, and inadequate exercise (Lakerveld et al., 2017).

**Intelligence** Heredity exerts a strong influence on general intelligence, as measured by intelligence tests, and a moderate effect on specific abilities such as memory, verbal ability, and spatial ability (Plomin & Von Stumm, 2018). Note that although specific genes might contribute to intelligence, intelligence is best described as shaped by large numbers of genes working together.

Indirect evidence of the role of heredity in intelligence comes from adoption and twin studies. Adopted children's scores on standardized intelligence tests are consistently closer to the scores of their biological mothers than to those of their adoptive parents and siblings; monozygotic twins are more alike in intelligence than dizygotic twins (Briley & Tucker-Drob, 2013).

Intelligence also depends in part on brain size and structure, which are under strong genetic control (Goriounova & Mansvelder, 2019). Experience counts, too. An enriched or impoverished environment can substantially affect the development and expression of innate ability (Kempermann, 2019). Environmental influence is greater, and heritability lower, among poor families than among more economically privileged families (Nisbett et al., 2012).

The influence of genes increases sharply with age (Plomin & Dreary, 2015). This increase is probably a result of niche-picking. The shared family environment has a strong influence on young children but little influence on adolescents, who are more apt to find their own niche by actively selecting environments compatible with their hereditary abilities and related interests (Bouchard, 2013).

**Temperament and Personality** When babies are exposed to a new experience, say riding on a train or playing with a new noisy toy, some infants respond with interest and excitement, and others with apprehension and withdrawal. Some babies are active, others less so. Some babies sleep and eat at the same time every day, others have difficulty settling into a consistent schedule. Right from the beginning, infants are utterly unique.

Psychologists call babies' unique and characteristic ways of approaching and reacting to environmental stimuli **temperament**. Temperament is largely inborn and is relatively consistent over the years, although it may respond to special experiences or parental handling (Goldsmith et al., 1987). In support of the role of genes, siblings—both twins and singletons—tend to be similar in temperament on such traits as positive affect, activity level (Saudino & Micalizzi, 2015), and behavioral regulation (Gagne & Saudino, 2010).

Temperament underlies adult personality. Given the genetic contributions found for temperament, one would predict personality research should also illustrate hereditary influences. This is indeed the case. Scientists have identified genes directly linked with specific aspects of personality such as neuroticism and extraversion (Vinkhuyzen et al., 2012). Overall, the heritability of personality traits appears to be around 40 percent (Vukasović & Bratko, 2015), and there is little evidence of shared environmental influence (Plomin, 2011). As with intelligence, genetic influences on personality appear to become more important with age (Briley & Tucker-Drob, 2014) and are shaped in part by active niche-picking (Kandler & Zapko-Willmes, 2017).

**Psychopathology** There is evidence for a hereditary influence on such mental disorders as schizophrenia, autism, alcoholism, and depression. All tend to run in families and to show greater concordance between monozygotic twins than between dizygotic twins. However, heredity alone does not produce such disorders; an inherited tendency can be triggered by environmental factors (Smoller et al., 2019).

Schizophrenia illustrates the interaction of heredity and genetics. **Schizophrenia** is a neurological disorder that affects about 1 percent of the US population each year (Society for Neuroscience, 2008). It is characterized by loss of contact with reality; hallucinations and delusions; loss of coherent, logical thought; and inappropriate emotionality.

#### temperament

Characteristic disposition, or style of approaching and reacting to situations.

#### schizophrenia

Mental disorder marked by loss of contact with reality; symptoms include hallucinations and delusions.



Another trait influenced by genetics is religiosity. Behavioral genetics research suggests that the tendency to believe strongly in a religion is moderately heritable; that is, at about the same level as intelligence (Waller et al., 1990).



Although temperamental characteristics—such as shyness—are genetically influenced, the environment modulates the expression of these tendencies and shapes the resulting adult personality.

Patricia Marks/Shutterstock

## checkpoint can you ...

- Discuss the evidence for genetic and environmental influences on physical and physiological traits such as obesity, intelligence, temperament, and schizophrenia?

Estimates of heritability range from 60 to 80 percent (Schwab & Wildenauer, 2013). A wide array of rare gene mutations, some of which involve missing or duplicated segments of DNA, may increase susceptibility to schizophrenia (Giegling et al., 2017). However, monozygotic twins are not always concordant for schizophrenia, perhaps due to epigenetic processes (Smigelski et al., 2020).

Researchers also have looked at possible nongenetic influences, such as a series of neurological insults in fetal life (Debnath et al., 2015), exposure to influenza or rubella (Brown, 2012), or high stress experienced by a mother during her pregnancy (Lipner et al., 2019). Infants born in urban areas or those whose mothers experienced obstetric complications or who were poor or severely deprived as a result of war or famine are at higher risk (Rapoport et al., 2012), as are infants born during the winter months (Martinez-Ortega et al., 2011). Advanced paternal age is also a risk factor for schizophrenia (Lan et al., 2020), and there are indications that, at least for boys, having very young fathers may put children at elevated risk as well (Miller et al., 2010).

## Prenatal Development

### gestation

Period of development between conception and birth.

### gestational age

Age of an unborn baby, usually dated from the first day of an expectant mother's last menstrual cycle.

For many women, the first clear (though not necessarily reliable) sign of pregnancy is a missed menstrual period. But even before that first missed period, a pregnant woman's body undergoes subtle but noticeable changes. Table 3 lists early signs and symptoms of pregnancy.

During gestation, the period between conception and birth, an unborn child undergoes dramatic processes of development. The normal range of gestation is between 37 and 41 weeks. Gestational age is usually dated from the first day of an expectant mother's last menstrual cycle.

**TABLE 3** Early Signs and Symptoms of Pregnancy

Physical Change	Causes and Timing
Missed period	May indicate pregnancy, although can be misleading
Tender, swollen breasts	Increased production of the female hormones estrogen and progesterone stimulates breast growth to prepare for producing milk.
Slight bleeding or cramping	Implantation bleeding may occur about 10 to 14 days after fertilization when ovum attaches to lining of uterus. Women may also cramp as the uterus enlarges.
Nausea with or without vomiting	Pregnancy hormones likely play a role. Morning sickness may begin as early as 2 weeks after conception but usually around 4 to 8 weeks and may occur at any time of day.
Frequent urination	Enlarging uterus during first trimester exerts pressure on the bladder.
Fatigue	Heart is pumping harder and faster to carry nutrients to the fetus. Stepped-up production of hormones takes extra effort. Progesterone depresses central nervous system and may cause sleepiness.
Mood swings	Flood of hormones early in pregnancy can produce emotional highs and lows.
Constipation	Increase in progesterone may slow digestion, so food passes more slowly through intestinal tract.
Food aversions	Hormonal changes may alter food preferences, especially during first trimester. Heightened sense of smell may trigger nausea in response to certain foods.
Faintness and dizziness	Lightheaded feeling may be triggered by blood vessel dilation and low blood pressure or by low blood sugar.
Raised basal body temperature	Basal body temperature (taken first thing in the morning) normally rises soon after ovulation each month and then drops during menstruation. When menstruation ceases, temperature remains elevated.

Source: Mayo Clinic (2021).

## CULTURAL BELIEFS ABOUT PRENATAL DEVELOPMENT

Although our modern understanding of pregnancy differs from traditional beliefs found in much of the world, people from all cultures share the understanding that the prenatal environment can profoundly shape the developing human.

Much of the research on cultural beliefs about prenatal development has been conducted in Asian countries, where common practices during pregnancy include massage, the use of traditional healers, medicines and herbs, taboos against the consumption of hot or cold foods, behavioral taboos, and superstitions (Withers et al., 2018). For example, in Chiang Mai, Thailand, women are sometimes cautioned against eating papaya, pickled foods, or more than half a banana during pregnancy. Spicy food, too, is advised against as it is thought to be associated with being born hairless, and coffee or tea is believed to negatively affect a child's intelligence (Liamputpong et al., 2005).

Similar taboos are found worldwide. In some areas of India, "cold" foods such as milk, yogurt, coconut, wheat, vegetables, and rice are recommended for pregnant women and believed to guard against miscarriage (Choudry, 1997). Alternatively, Guatemalan mothers are warned to avoid "hot" foods such as meat and beans (Cosminsky, 1982). The Walpiri aboriginal people of Australia warn pregnant mothers to avoid eating food made from spiked animals such as anteaters, monitor lizards, or possums and are told to be careful not to harm any animal associated with their developing baby's spirit, which is shaped by the geographical area in which the child is conceived (Pierroutsakos, 2000). Traditional beliefs for the Konya of Turkey specify mothers should eat quince if a dimpled baby is desired or apples if they want their child to have ruddy cheeks (Okka et al., 2016). And, Canadian First Nations people believe it is important to eat foods such as wild meat, fish, white carrots, potatoes, rice, and berries for the baby's health, and also stress the importance of moderate exercise lest the baby stick to the womb and experience a difficult labor (Sokoloski, 1995).

These cultural beliefs are interesting because they highlight important cultural messages and beliefs about pregnancy. However, they are also important because traditional beliefs may clash with modern medical treatment, leading some women to forego prenatal care. For example, pregnant Zambian women in one study avoided medical care during pregnancy in part because they believed if they divulged their use of traditional healers to health care providers, they would be denied service (Maimbolwa et al., 2003).



Pregnancy tests identify the presence of human chorionic gonadotropin, which, under normal circumstances, is produced only by embryos and fetuses. So there are no false positives.

A pregnancy might not be viable, but a positive pregnancy test tells a woman a conception has occurred.

## STAGES OF PRENATAL DEVELOPMENT

Prenatal development takes place in three stages: **germinal**, **embryonic**, and **fetal**. (Table 4 gives a month-by-month description.)

Both before and after birth, development proceeds according to two fundamental principles: Growth and motor development occur from the top down and from the center of the body outward. The **cephalocaudal principle**, from Latin, meaning "head to tail," dictates that development proceeds from the head to the lower part of the trunk. An embryo's head, brain, and eyes develop earliest and are disproportionately large until the other parts catch up. According to the **proximodistal principle**, from Latin, meaning "near to far," development proceeds from parts near the center of the body to outer ones. The embryo's head and trunk develop before the limbs, and the arms and legs before the fingers and toes.

### cephalocaudal principle

Principle that development proceeds in a head-to-tail direction; that is, that upper parts of the body develop before lower parts of the trunk.

### proximodistal principle

Principle that development proceeds from within to without; that is, that parts of the body near the center develop before the extremities.

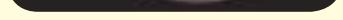
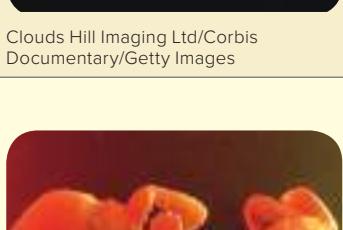
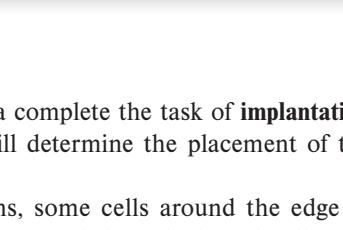
### germinal stage

First 2 weeks of prenatal development, characterized by rapid cell division, blastocyst formation, and implantation in the wall of the uterus.

**Germinal Stage (Fertilization to 2 Weeks)** During the **germinal stage**, from fertilization to about 2 weeks of gestational age, the zygote divides, becomes more complex, and is implanted in the wall of the uterus.

Within 36 hours after fertilization, the zygote enters a period of rapid cell division and duplication (mitosis). Seventy-two hours after fertilization, it has divided first into 16 and then into 32 cells; a day later, it has 64 cells. While the fertilized ovum is dividing, it is also making its way through the fallopian tube to the uterus, a journey of 3 or 4 days. Its form changes into a blastocyst, a fluid-filled sphere, which floats freely in the uterus until the sixth day after fertilization, when it begins to implant itself in the uter-

**TABLE 4** Milestones in Prenatal Development

Age	Accomplishments	
3 weeks	Nervous system begins to form.	
4 weeks	Heart begins to beat.	
5 weeks	Head continues rapid growth.	
8 weeks	Almost all body parts are differentiated.	
12 weeks	Growth of head slows. Formation of red blood cells by liver slows.	 Biophoto Associates/Science Source
14 weeks	Begins to coordinate limb movement	
16 weeks	Possible to visually determine baby's sex Ultrasound shows clearly defined bone structure.	
20 weeks	Possible to hear heartbeat with stethoscope Baby covered by fine downy hair called lanugo. Fetal movements called quickening are felt by mother.	 Clouds Hill Imaging Ltd/Corbis Documentary/Getty Images
21 weeks	Rapid eye movements commence. Substantial weight gain	
24 weeks	Fingernails can be seen.	
28 weeks	Eyes open and close. Lungs capable of breathing	
32 weeks	Skin pink and smooth Chubby appearance	
38 weeks	Nervous system can carry out some integrative functions. Reacts to light Usually assumes upside-down position as birth approaches	 James Stevenson/Science Source

Sources: Leifer (2003); Moore & Persaud (2003); Olds et al. (1996).

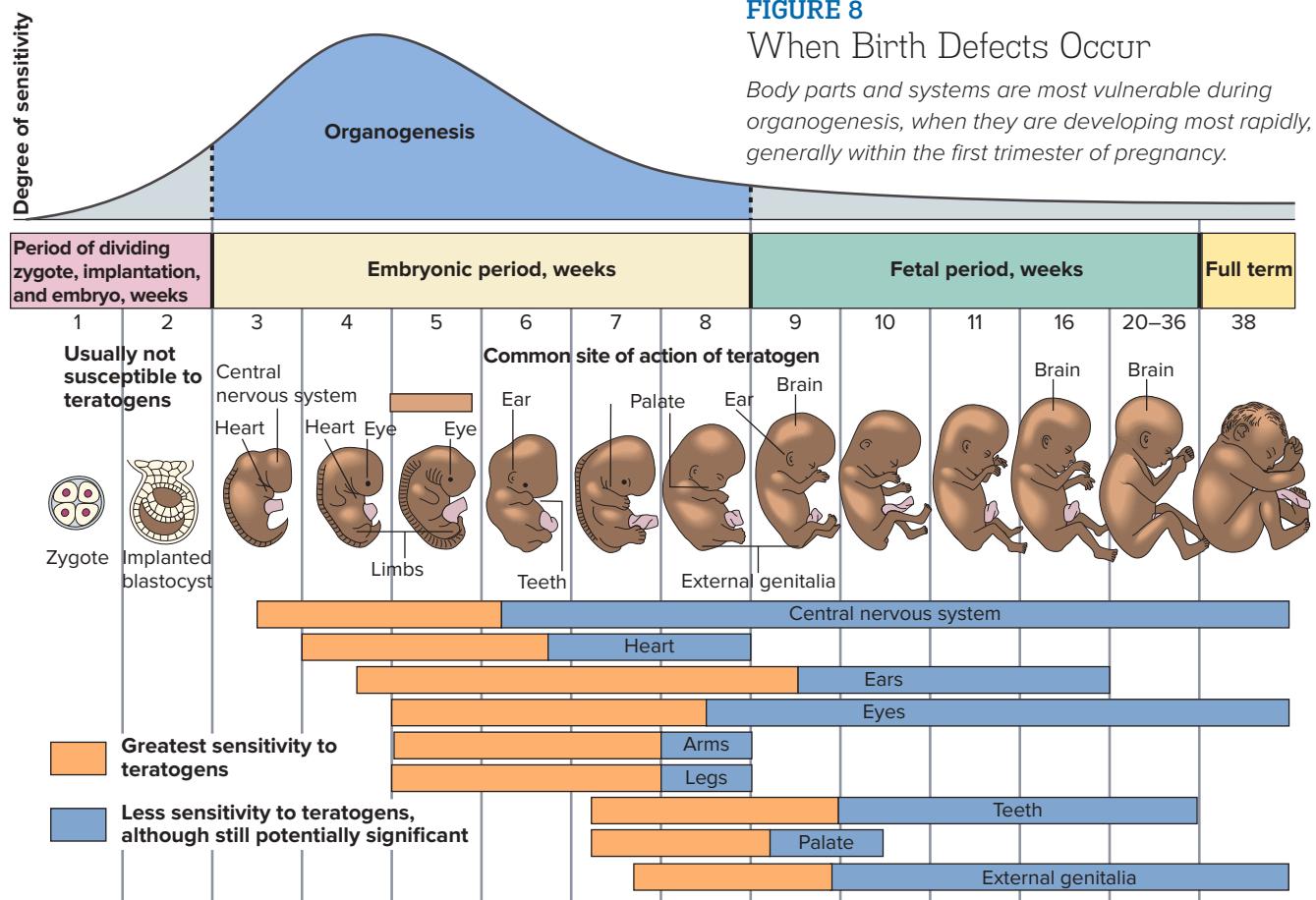
### implantation

The attachment of the blastocyst to the uterine wall, occurring at about day 6.

ine wall. Only about 10 to 20 percent of fertilized ova complete the task of **implantation** and continue to develop. Where the egg implants will determine the placement of the placenta.

Before implantation, as cell differentiation begins, some cells around the edge of the blastocyst cluster on one side to form the embryonic disk, a thickened cell mass from which the embryo begins to develop. This mass will differentiate into three layers. The ectoderm, the upper layer, will become the outer layer of skin, the nails, hair, teeth, sensory organs, and the nervous system, including the brain and spinal cord. The endoderm, the inner layer, will become the digestive system, liver, pancreas, salivary glands, and respiratory system. The mesoderm, the middle layer, will develop and differentiate into the inner layer of skin, muscles, skeleton, and excretory and circulatory systems.

Other parts of the blastocyst begin to develop into organs that will nurture and protect development in the womb: the amniotic cavity, or amniotic sac, with its outer layers, the amnion and chorion; the placenta; and the umbilical cord. The amniotic sac is a fluid-filled membrane that encases the developing embryo, protecting it and giving it room to move and grow. The placenta allows oxygen, nourishment, and wastes to pass between mother and embryo. It is connected to the embryo by the umbilical cord. Nutrients from the mother pass from her blood to the embryonic blood vessels, which



carry them, via the umbilical cord, to the embryo. In turn, embryonic blood vessels in the umbilical cord carry embryonic wastes to the placenta, where they can be eliminated by maternal blood vessels. The mother's and embryo's circulatory systems are not directly linked; instead, this exchange occurs by diffusion across the blood vessel walls. The placenta also helps to combat internal infection and gives the unborn child immunity to various diseases. It produces the hormones that support pregnancy, prepare the mother's breasts for lactation, and eventually stimulate the uterine contractions that will expel the baby from the mother's body.

**Embryonic Stage (2 to 8 Weeks)** During the **embryonic stage**, from about 2 to 8 weeks, the organs and major body systems—respiratory, digestive, and nervous—develop rapidly. This process is known as organogenesis. This is a critical period, when the embryo is most vulnerable to destructive influences in the prenatal environment (Figure 8). Any organ system or structure that is still developing at the time of exposure is most likely to be affected. Because of this, defects that occur later in pregnancy are likely to be less serious as the major organ systems and physical structures of the body are complete. Brain growth and development begin during the embryonic stage and continue after birth and beyond.

The most severely defective embryos usually do not survive beyond the first trimester, or 3-month period, of pregnancy. A **spontaneous abortion**, commonly called a miscarriage, is the expulsion from the uterus of an embryo or fetus that is unable to survive outside the womb. A miscarriage that occurs after 20 weeks of gestation is generally characterized as a stillbirth.

embryonic stage

Second stage of gestation (2 to 8 weeks), characterized by rapid growth and development of major body systems and organs.

spontaneous abortion

Natural expulsion from the uterus of an embryo that cannot survive outside the womb; also called *miscarriage*.

The Supreme Court ruling overturning *Roe v. Wade* has put medical care for miscarriage in jeopardy. Because treating a miscarriage involves the same procedures and medications as abortion, doctors in states in which abortion has been outlawed risk prosecution for treating a miscarriage. Women in such states now face having to continue a nonviable pregnancy, increasing the risk of hemorrhage, infection, and sepsis.



Eighty percent of spontaneous abortions occur in the first trimester before a woman realizes she is pregnant, making it difficult to determine rates. However, of those women who do realize they are pregnant, 1 in 4 will miscarry (American College of Obstetricians and Gynecologists, 2018). Estimates are that this results in approximately 1 million fetal deaths each year in the United States alone. Miscarriages are more common in African American women and American Indian or Alaska Native women than in White women and in both young and older (greater than 35 years of age) mothers; they are also more likely to occur in pregnancies involving twins or higher order multiples (MacDorman & Gregory, 2015).

Males are more likely than females to be spontaneously aborted or to be stillborn (dead at or after the 20th week of gestation). Thus, although about 125 males are conceived for every 100 females—a fact that has been attributed to the greater mobility of sperm carrying the smaller Y chromosome—only about 105 boys are born for every 100 girls (Martin et al., 2021). Males' greater vulnerability continues after birth: More die early in life, and at every age they are more susceptible to many disorders. As a result, there are only about 97 males for every 100 females in the United States (US Census Bureau, 2020).

**Fetal Stage (8 Weeks to Birth)** The appearance of the first bone cells at about 8 weeks signals the beginning of the **fetal stage**, the final stage of gestation. During this period, the fetus grows rapidly to about 20 times its previous length, and organs and body systems become more complex. Right up to birth, finishing touches such as fingernails, toenails, and eyelids continue to develop.

Fetuses are not passive passengers in their mothers' wombs. They breathe, kick, turn, flex their bodies, do somersaults, squint, swallow, make fists, hiccup, and suck their thumbs. The flexible membranes of the uterine walls and amniotic sac, which surround the protective buffer of amniotic fluid, permit and stimulate limited movement, and after approximately 16 to 25 weeks of gestation, the movements are strong enough for expectant mothers to detect them. Scientists can observe fetal movement through **ultrasound**, the use of high-frequency sound waves to detect the outline of the fetus. Other instruments can monitor heart rate, changes in activity level, states of sleep and wakefulness, and cardiac reactivity.

The movements and activity level of fetuses show marked individual differences, and their heart rates vary in regularity and speed. Male fetuses, regardless of size, are more active and tend to move more vigorously than female fetuses throughout gestation (Almli

## checkpoint can you ...

- Describe how a zygote becomes an embryo and explain why defects and miscarriages most often occur during the embryonic stage?

Ultrasound, the procedure this woman is undergoing, is a diagnostic tool that presents an immediate image of the fetus in the womb. High-frequency sound waves directed at the woman's abdomen reveal the fetus's outline and movements. Ultrasound is widely used to monitor fetal development and to detect abnormalities.

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et al., 2001). Thus, infant boys' tendency to be more active than girls may be at least partly inborn (DiPietro et al., 2002).

Beginning during the 8th week of gestation, an estimated 250,000 immature **neurons**—nerve cells—are produced every minute. The number of neurons increases most rapidly between the 25th week of gestation and the first few months after birth. Originally, the neurons are simply cell bodies with a nucleus, or center, composed of deoxyribonucleic acid (DNA), which contains the cell's genetic programming. As the brain grows, these rudimentary cells migrate to various parts of the brain (Bystron et al., 2006). Most of the neurons in the higher areas of the brain are in place by 20 weeks of gestation, and the structure becomes increasingly well defined during the next 12 weeks.

*Perceptual and Cognitive Development in Fetuses* Both taste buds (taste) and olfactory receptors (smell) begin to form at about 8 weeks of gestation. From about the 12th week of gestation, the fetus swallows and inhales some of the amniotic fluid in which it floats. By about week 20, taste buds become functional, and shortly thereafter, so do olfactory receptors (Bloomfield et al., 2017). Because the amniotic fluid contains substances that cross the placenta from the mother's bloodstream, this influences the development of taste and smell. Exposure to strong flavors (e.g., garlic) repeatedly during pregnancy, as may happen if pregnant women's diets contain high levels of such foods, has been shown later to lead to higher acceptance of them in children's diets (De Cosmi et al., 2017).

Fetuses respond to the mother's voice and heartbeat and the vibrations of her body, suggesting they can hear and feel. Responses to sound and vibration seem to begin at 26 weeks of gestation, increase, and then reach a plateau at about 32 weeks (Kisilevsky et al., 1992). Voices, especially women's voices and particularly those of the mother, seem to be relevant for fetuses. For example, heart rate data indicate that fetuses recognize their mother's voice and prefer it to that of other women (Paquette et al., 2018) and their father (Lee & Kisilevsky, 2014). Although fetuses, starting at approximately 33 weeks of gestation, orient toward and attend to music (Kisilevsky et al., 2004), speech is a stronger draw. Near-term fetuses exposed to either music or speech show heart rate changes consistent with more sustained attention toward and increased processing of speech over music (Granier-Deferre et al., 2011). Once born, neonates prefer female voices to male voices and their mother's native language to other languages (Pino, 2016), as illustrated by their willingness to suck longer on a modified pacifier rigged to play a tape as long they suck on it.

While fetuses do sometimes move in response to touch or pressure, it is highly unlikely they have any conscious awareness of pain before the third trimester. This is because many of the relevant structures are immature at this point. For example, receptors in the skin lack nerve pathways to the spinal cord necessary for transferring pain stimuli to the brain until 16 to 25 weeks of gestation (Tadros et al., 2015), and the cortex (where consciousness is believed to reside) is immature at this point (Bellieni & Buonocore, 2012). Moreover, the thalamocortical pathways responsible for pain perception do not appear to be functional until 29 to 30 weeks of gestation (Kostović & Judas, 2010). Additionally, facial expressions of pain at 24 weeks of gestation are almost absent (5 percent of facial events) but appear more frequently (21.2 percent of facial events) at 36 weeks of gestation (Reissland et al., 2013).

Fetuses learn and remember as they near the end of the pregnancy. Heart rate data indicate that fetuses have some ability to remember auditory material for short periods of time (Pino, 2016). Current estimates suggest that fetal memory begins to function at approximately 30 weeks of gestational age, when fetuses are able to hold information in memory for 10 minutes. By 34 weeks, they are able to remember information for a period of 1 month (Dirix et al., 2009). Moreover, fetuses not only remember and recognize voices, but they also have some limited ability to reproduce them. For example, Cameroonian infants whose mothers spoke tonal languages produced more complex cries than German children, reflecting the more complex tonal structure of their language environment (Wermke et al., 2016).

#### fetal stage

Final stage of gestation (from 8 weeks to birth), characterized by increased differentiation of body parts and greatly enlarged body size.

#### ultrasound

Prenatal medical procedure using high-frequency sound waves to detect the outline of a fetus and its movements, so as to determine whether a pregnancy is progressing normally.

#### neurons

Nerve cells.



There are suggestions fetal heart rate variability, a marker of neurological development, may be lower in Black fetuses than in White fetuses (Marie, 2015). Thus, because levels are calibrated with respect to White fetuses, readings for Black fetuses may indicate problems when none exists and could lead to unnecessary medical interventions.

#### checkpoint

can you...

- List several changes that occur during the fetal stage?
- Discuss findings about fetal activity, sensory development, and memory?

## ENVIRONMENTAL INFLUENCES: MATERNAL FACTORS

In traditional societies, pregnancy is recognized as a dangerous time for both a woman and her unborn baby. Among the Beng of West Africa's Ivory Coast, for example, a woman who has "taken a belly" is warned to stay away from corpses, lest her baby be born diseased; not to offend someone who might curse her pregnancy; and not to eat certain foods, such as pureed yams, lest her labor be difficult (Gottlieb, 2016). Many folk beliefs have a basis in fact. Because the prenatal environment is the mother's body, virtually everything that influences her well-being may alter her unborn child's environment and affect its growth.

### teratogen

Environmental agent, such as a virus, a drug, or radiation, that can interfere with normal prenatal development and cause developmental abnormalities.

A **teratogen** is an environmental agent, such as a virus, a drug, or radiation, that can interfere with normal prenatal development. However, not all environmental hazards are equally risky for all fetuses. An event, substance, or process may be teratogenic for some fetuses but have little or no effect on others. Teratogens also have their most damaging effects on systems that are developing during the time that the exposure occurs. Sometimes vulnerability may depend on a gene either in the fetus or in the mother. The timing of exposure, dose, duration, and interaction with other teratogenic factors also may make a difference.

**Nutrition and Maternal Weight** Pregnant women typically need 300 to 500 additional calories a day, including extra protein. Weight gain recommendations vary for pregnant mothers. Current recommendations are that women who are underweight should gain 28 to 40 pounds, normal-weight women should gain 25 to 35 pounds, overweight women should gain 15 to 25 pounds, and obese women should gain only 11 to 20 pounds. Women carrying twins or other multiples are advised to gain an additional 14 to 22 pounds, depending on their weight status before becoming pregnant (Centers for Disease Control and Prevention, 2021).

Women who gain the recommended amount of weight are less likely to have birth complications or to bear babies whose weight at birth is dangerously low or overly high. If a woman does not gain enough, her baby is likely to suffer growth retardation in the womb, to be born prematurely, to experience distress during labor and delivery, or to die at or near birth. A woman who gains too much weight risks having a large baby that needs to be delivered by induced labor or surgically by cesarean section. Additionally, both the mother and baby are at increased risk for later weight problems and the development of cardiometabolic risk factors (Centers for Disease Control and Prevention, 2021; Catalano & Shanker, 2017). Unfortunately, in the United States, 21 percent of women do not gain enough weight and 48 percent gain too much (Branum et al., 2016).

What an expectant mother eats is also important. For example, an omega-3 fatty acid, docosahexaenoic acid (DHA), found in certain fish is used in the central nervous system and the retina of the eye, and it is believed to be important to the development of these areas (Rogers et al., 2013). In support of this, newborns whose mothers consumed DHA showed more mature sleep patterns, a sign of advanced development, than infants whose mothers' blood had lower levels of DHA (Cheruku, et al., 2002), and were more attentive at 12 and 18 months (Colombo et al., 2004). There are also effects on the health of the pregnancy. Mothers who consume higher levels of DHA are more likely to have heavier babies (a sign of good health) and longer gestational periods, and they are at decreased risk of preterm birth (Carlson et al., 2013; Salvig & Lamont, 2011).

Folic acid, or folate (a B vitamin), found in leafy vegetables and in fortified cereals, is also critical in a pregnant woman's diet. Inadequate levels of folic acid can leave babies at risk of developing a neurological defect such as **anencephaly**, a condition in which the brain is formed incompletely or improperly, or **spina bifida**, a condition in which the baby's spinal cord is not fully enclosed. Addition of folic acid to enriched grain products has been mandatory in the United States since 1998, reducing the incidence of these defects by approximately 1,300 children a year (Williams et al., 2015). Milder folic acid deficiencies in pregnant mothers can result in less severe but still troubling problems. For example, low folate levels during pregnancy have been associated with later attention-deficit/hyperactivity in 7- to 9-year-old children (Schlotz et al., 2009).

**Malnutrition** Malnutrition is a global problem driven by factors such as poverty, conflict, and climate change, and more recently, by the COVID-19 pandemic. Worldwide, approximately 820 million people suffer from calorie deficiency (World Health Organization, 2020). Although there are gaps in the data, estimates are that approximately 2 billion people suffer from chronic micronutrient deficiencies (Ritchie & Roser, 2017). Micronutrients are vitamins or minerals that are needed in small quantities but have a profound negative effect if absent. Either form of malnutrition during pregnancy is an urgent issue as it not only can hurt the expectant mother and her child, but also exert effects across generations (Martorell & Zongrone, 2012).

When expectant mothers suffer from a calorie deficit, the results can be fetal growth restriction and low birth weight. Additionally, babies born to mothers who do not consume sufficient calories have a higher risk of death, and surviving children may be stunted. Expectant mothers can also suffer from micronutrient deficiencies in vitamins or minerals. For example, vitamin A and zinc deficiencies result in a higher risk of death for both child and mother (Black et al., 2013), and babies born to mothers with a vitamin D deficiency may suffer from weak or soft bones (Anastasiou et al., 2017).

Fetal undernutrition has also been associated with a number of increased risks for disease in adulthood. For example, several studies have identified a link between famine experienced during pregnancy and the later occurrence of schizophrenia in children born during that time period (Rapoport et al., 2012; Lumey et al., 2011). Similar findings have emerged for an increased risk of diabetes (Wang et al., 2017), overweight/obesity in adulthood (Lumey et al., 2011), and even mortality (Ekamper et al., 2015).

It is important to identify malnutrition early in pregnancy so that it can be treated. Malnourished women who take caloric dietary supplements while pregnant tend to have bigger, healthier, more active, and more visually alert infants (Brown, 1987; Vuori et al., 1979; Imdad & Bhutta, 2011). Similarly, micronutrient supplementation for malnourished expectant mothers results in larger babies and fewer stillbirths (Haider & Bhutta, 2017).

**Physical Activity and Work** Among the Ifaluk of the Western Caroline Islands, women are advised not to harvest crops during the first 7 months of pregnancy, when the developing fetus is thought to be weak, but to resume manual labor during the last 2 months to encourage a speedy delivery (Le, 2000). In actuality, moderate exercise any time during pregnancy does not seem to endanger the fetuses of healthy women. Regular exercise reduces constipation and back pain, and it may lower the risk of complications such as gestational diabetes, preeclampsia, or cesarean delivery.

The American College of Obstetricians and Gynecologists (2021) recommends that women in low-risk pregnancies get at least 150 minutes of moderate to intense aerobic exercise a week, making sure to drink plenty of water and to avoid becoming overheated. Contact sports or activities that might result in a fall should be avoided. Employment during pregnancy generally entails no special hazards. However, strenuous working conditions, occupational fatigue, and long working hours may be associated with a greater risk of premature birth (Bell et al., 2008).

**Drug Intake** What are the effects of the use of specific drugs during pregnancy? Let's look at the influence of prescription drugs, then at alcohol, nicotine, and caffeine, and finally at marijuana, cocaine, and methamphetamine.

**Medical Drugs** Among the medical drugs that may be harmful during pregnancy are the antibiotic tetracycline; certain barbiturates, opiates, and other central nervous system depressants; several hormones, including diethylstilbestrol (DES) and androgens; certain anticancer drugs, such as methotrexate; Accutane, a drug often prescribed for severe acne; drugs used to treat epilepsy; and several antipsychotic drugs (Briggs et al., 2012). Angiotensin-converting enzyme (ACE) inhibitors and nonsteroidal anti-inflammatory drugs (NSAIDs), such as naproxen and ibuprofen, have been linked to birth defects when taken anytime from the first trimester on (Halpren et al., 2019; Antonucci et al., 2012). The use of antidepressants, such as Prozac, during pregnancy may also cause harm. Mothers treated for depression during pregnancy were more likely to have low-birth-weight infants or to



For many years, it was a mystery why China had the highest incidence of anencephaly and spina bifida. The reason? Traditionally, Chinese couples married in January or February and tried to conceive as soon as possible. Thus, their pregnancies often began in the winter, when rural women had little access to fresh fruits and vegetables, important sources of folic acid. (Berry et al., 1999).



While animal research has its place in medical testing, it also has limitations. One drug—thalidomide—was tested on animals before being prescribed for pregnant women and indicated no ill effects. However, in humans, it quickly and tragically became clear that thalidomide was closely linked to major birth defects.

have their newborns admitted to the neonatal intensive care than untreated mothers with depression (Xing et al., 2020). In addition, certain antipsychotic drugs used to manage severe psychiatric disorders may have potential effects on the fetus, including withdrawal symptoms at birth (Hudak & Tan, 2012).

Given the issues associated with the use of drugs during pregnancy, why would pregnant women take any medications at all? The use of any drug is a balance of risks and benefits, and at times, the risk of not taking a drug will outweigh the potential risk to the pregnancy. Recommendations are that no medication be prescribed for a pregnant or breast-feeding woman unless it is essential for her health or her child's. If medication is necessary, the most effective drug with the fewest side effects should be selected (Riley et al., 2017).

*Opioids* In recent years, the number of pregnant women abusing legal and illegal opioids has risen. While opioid use has not been implicated in birth defects, it is associated with small babies, fetal death, preterm labor, and aspiration of meconium (the earliest stool produced by babies). Moreover, babies born to drug-addicted mothers are often addicted themselves and go through withdrawal once they are born and no longer receiving the drug. This results in neonate abstinence syndrome, a condition in which newborns may show sleep disturbances, tremors, difficulty regulating their bodies, irritability and crying, diarrhea, fever, and feeding difficulties.

From 2010 to 2017, the prevalence of this condition increased from 4 to 7.3 per 1,000 hospital births (Hirai et al., 2021). Long-term effects include deficiencies in growth as well as attentional, memory, and perceptual problems. However, studies on cognitive outcomes are conflicting, and results may be due to other variables (such as socioeconomic status or other drug use) correlated with opioid use (Reddy et al., 2017). Punitive measures such as jailing pregnant women who use these drugs have been shown to be ineffective. This has led to calls to address the opioid crisis in pregnant women as a public health problem rather than a law enforcement issue (Patrick & Schiff, 2017).

#### fetal alcohol syndrome (FAS)

Combination of mental, motor, and developmental abnormalities affecting the offspring of some women who drink heavily during pregnancy.



A mother who drinks during pregnancy risks having a child born with fetal alcohol syndrome.

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*Alcohol* Prenatal alcohol exposure is the most common cause of intellectual disability and the leading preventable cause of birth defects in the United States (Sacks et al., 2015). Fetal alcohol syndrome (FAS) is characterized by a combination of retarded growth, face and body malformations, and disorders of the central nervous system.

Worldwide, approximately 119,000 children are born with FAS every year (Tsang & Elliot, 2017). Exposure rates vary widely by region, from 25.2 percent in European countries to a low of 0.2 percent in the Eastern Mediterranean regions (Popova et al., 2018). In the United States, FAS and other less severe alcohol-related conditions are estimated to occur in nearly 1 in every 20 births (Sacks et al., 2015). Even small amounts of social drinking may harm a fetus, and the more the mother drinks, the greater the effect. Moderate or heavy drinking during pregnancy can disturb an infant's neurological and behavioral functioning.

FAS-related problems can include reduced responsiveness to stimuli and slow reaction time in infancy and, throughout childhood, short attention span, distractibility, restlessness, hyperactivity, learning disabilities, memory deficits, mood disorders, aggressiveness, and problem behavior (Gupta et al., 2016). Prenatal alcohol exposure is also a risk factor for development of alcohol and psychiatric disorders in adulthood (Rangmar et al., 2015).

Some FAS problems recede after birth, but others, such as retarded growth, behavioral and learning problems, and hyperactivity, tend to persist. However, early interventions can help children develop to their fullest potential. Interventions may focus on the affected child or may provide parental support, training, and education. Research has shown that interventions can improve attention, self-regulation, adaptive functioning, and social skills in affected children (Reid et al., 2015; Petrenko, 2015).

Although it is clear that alcohol use during pregnancy can have devastating consequences, more research is needed. In particular, research on

interventions targeting affected adolescents and adults is scarce, which is problematic, given the evidence that issues faced by children compound with age if left untreated (Reid et al., 2015). Additionally, at an international level, research on cultural barriers is sorely needed. For example, one key prevention tactic involves educating parents on the risks of drinking during pregnancy. However, in cultures where alcohol use during pregnancy is not stigmatized, this education is less effective. Alternatively, if drinking during pregnancy is stigmatized, stigma may make it difficult to obtain reliable information on prenatal alcohol exposure (Petrenko & Alto, 2017).

**Nicotine** Maternal smoking during pregnancy has been identified as the single most important factor in adverse pregnancy outcomes in both developed and developing countries. Approximately 45 percent of women who smoke are able to quit smoking while pregnant, although almost 80 percent will smoke again within a year (Mund et al., 2013). In 2019, 6 percent of American women who gave birth reported smoking during the pregnancy (Martin et al., 2021).

Women who smoke during pregnancy are more than 1½ times as likely as nonsmokers to bear low-birth-weight babies (weighing less than 5½ pounds at birth). Women who smoke during pregnancy are also more likely to miscarry or have birth complications, preterm babies, or babies that die from sudden infant death syndrome (Centers for Disease Control and Prevention, 2020). Although even light smoking (fewer than five cigarettes a day) is associated with a greater risk of low birth weight, the effect is dose dependent. Thus, mothers who smoke more than 20 cigarettes a day have the smallest babies (Ko et al., 2014).

Secondhand smoke exerts similar effects. In low- to middle-income countries, some data exist to indicate it is more common than active smoking itself and thus a key variable in birth outcomes (Reece et al., 2019). The effects of prenatal exposure to secondhand smoke on development tend to be worse when children also experience socioeconomic hardship during the first 2 years of life (Rauh et al., 2004) and when they are exposed to additional teratogens such as lead (Froehlich et al., 2009) or deprived of necessary nutrients such as folic acid (Mook-Kanamori et al., 2010) at the same time.

**Caffeine** Several large-scale reviews have indicated that caffeine intake under 300 milligrams a day is not associated with an increased risk of miscarriage, stillbirth, or birth defects (Peck et al., 2010; Doepker et al., 2018). However, other reviews have found a slightly increased risk of miscarriage, stillbirth, low birth weight, and other conditions for mothers who consume caffeine while pregnant (James, 2021), and there are suggestions that risk may increase with dosage (Chen et al., 2014). To complicate the matter further, there are indications that individuals may be differentially sensitive to caffeine. In other words, some pregnant people (or their fetuses) will respond negatively to exposure, and some will not (Qian et al., 2020). Thus, current recommendations on limiting caffeine to 200 milligrams or less (about one cup of coffee) are still in place, and individuals sensitive to the effects of caffeine should be wary.

**Marijuana** Marijuana is the most commonly used recreational drug during pregnancy, and rates of women who report using marijuana while pregnant have risen in concert with more liberal usage laws in many states (Gnofam et al., 2020). Slightly over 4 percent of pregnant women report using marijuana while pregnant (Ko et al., 2020). Some women cite medical concerns, including nausea, anxiety, and pain management, as the impetus to use marijuana during pregnancy (Metz & Borgelt, 2018).

Research on marijuana is difficult. For example, many pregnant women who use marijuana also smoke cigarettes or consume alcohol, and socioeconomic factors also seem to be important (Metz & Stickrath, 2015). Moreover, the effects of prenatal marijuana exposure are relatively weak and are difficult to interpret (Sharapova et al., 2018).

Some research does suggest that marijuana exposure, especially at high levels, is associated with low birth weight, preterm delivery, difficult births, and admission into neonatal intensive care (Metz & Borgelt, 2018; Gunn et al., 2016). However, marijuana



Because it would be unethical to conduct the kind of randomized, experimental research that would answer the question, we cannot determine what "safe" levels of drinking are.



The drug Accutane is most commonly used for severe acne, although it has multiple other applications, including treatment of some cancers. Accutane is highly teratogenic and can cause a variety of severe birth defects, including intellectual disability, facial abnormalities, and hearing and vision problems. Should the use of Accutane be permitted for women of childbearing age? What safeguards should be required?



One of the problems with figuring out the influence of marijuana on pregnancy and birth outcomes is that much of the research in this area was conducted in the 1980s and earlier. At that time, the concentration of the active ingredient in marijuana, delta-9-tetrahydrocannabinol (THC), was much lower than it is now (Thompson et al., 2019), making comparisons difficult.

exposure has not been associated with decreases in general intelligence (Torres et al., 2020). Moreover, research reviewing performance on cognitive and neurological variables has found decreased performance on memory, impulse control, problem-solving, reasoning, verbal development, and visual analysis but higher performance on other measures such as attention and motion perception (Sharapova et al., 2018).

Still, marijuana use during pregnancy has been associated with subtle neurological differences and deficits in problem-solving skills (Viteri et al., 2015; McLemore & Richardson, 2016), and it may alter patterns of cerebral blood flow (Smith et al., 2016). This may explain why marijuana exposure during the prenatal period is also associated with decreases in academic achievement (Goldschmidt et al., 2012). There are also clear theoretical reasons to suspect exposure will alter brain development. Thus, the recommendations are that pregnant women should avoid or minimize its use.

**Cocaine** Cocaine use during pregnancy has been associated with delayed growth, placental displacement, preterm delivery, low birth weight, small head size, and impaired neurological development (Dos Santos et al., 2018). In some studies, cocaine-exposed newborns show hypertonia (increased muscle tone and decreased flexibility) and are more excitable and irritable. In childhood, exposure is associated with subtle language delays and problems with attention and self-regulation (Smith & Santos, 2016). Prenatal cocaine exposure does not appear to affect global cognitive development; however, it may preferentially affect areas of the brain involved in language and memory tasks and has been associated with declines in academic performance in adolescence (Richardson & Day, 2018; Buckingham-Howes et al., 2013). It has also been linked to other problems in adolescence and adulthood, including aggression, conduct disorders, greater likelihood of arrest, substance abuse, and risky sexual behaviors (Min et al., 2014; Richardson et al., 2019). Other studies, however, have found little specific connection between prenatal cocaine exposure and deficits that could not also be attributed to other risk factors, such as low birth weight; exposure to tobacco, alcohol, or marijuana; or a poor home environment (Konijnenberg, 2015).

Does society's interest in protecting unborn children justify the use of coercive measures, such as jail, against pregnant women who ingest harmful substances? Where should the boundary between personal liberties and protecting fetuses be set?



**Methamphetamine** Methamphetamine is the second most commonly used illegal drug globally (Perez et al., 2021). Physically, prenatal methamphetamine exposure is associated with preterm delivery, low birth weight, and reduced head circumference. Additionally, exposure is also implicated in neonatal neurobehavioral abnormalities, such as quality of movement, lethargy, stress, and arousal. Fortunately, many of these abnormalities appear to resolve themselves by 1 month of age (Kiblawi et al., 2014). However, prenatal exposure to methamphetamines has been associated with fetal brain damage to areas of the brain involved in learning, memory, and control, which are likely to have longer-term consequences (Roussotte et al., 2011). For instance, methamphetamine-exposed children are more likely to have behavioral problems, high levels of aggression, poor academic performance, and deficits in executive functioning, particularly if also exposed to early adversity (Perez et al., 2021).

#### acquired immune deficiency syndrome (AIDS)

Viral disease that undermines effective functioning of the immune system.

**Maternal Illnesses** Both prospective parents should try to prevent all infections—common colds, flu, urinary tract and vaginal infections, as well as sexually transmitted diseases. If the mother does contract an infection, she should have it treated promptly.

**Acquired immune deficiency syndrome (AIDS)** is a disease caused by the human immunodeficiency virus (HIV), which undermines functioning of the immune system. If an expectant mother has the virus in her blood, perinatal transmission may occur: The virus may cross over to the fetus's bloodstream through the placenta during pregnancy, labor, or delivery or, after birth, through breast milk.

The biggest risk factor for perinatal HIV transmission is a mother who is unaware she has HIV. In the United States, new pediatric AIDS cases have declined steadily since 1992 due to routine testing and treatment of pregnant women and newborn babies and to advances in the prevention, detection, and treatment of HIV infection in infants. The risk of perinatal HIV infection can be as low as 1 percent when an infected mother takes HIV medicine daily throughout her pregnancy, labor, and delivery, gives HIV medicine

to her baby for 4 to 6 weeks after delivery, opts for a cesarean section if her viral load is not sufficiently reduced, and avoids breast-feeding or prechewing her infant's food (Centers for Disease Control and Prevention, 2021).

Rubella (German measles) is a disease that can cause miscarriage or stillbirth and is associated with a wide variety of birth defects in any baby that survives, including cleft palate, deafness, and heart defects. It is not the same virus as measles and is less contagious and typically milder in nature. However, its effects on pregnancy are catastrophic, and the earlier in the pregnancy a woman contracts rubella, the more dangerous it is for the developing child (Centers for Disease Control and Prevention, 2020).

Global vaccination campaigns reduced reported rubella cases by 97 percent in the period from 2000 to 2018 (World Health Organization, 2019). The COVID-19 pandemic, however, has halted some public health efforts. Currently, 41 countries have delayed vaccination campaigns, increasing the risk of bigger outbreaks for all (Centers for Disease Control and Prevention, 2022). In the United States, there have been outbreaks of measles driven primarily by the importation of the disease from international travel. In 2019, 1,282 cases of measles were confirmed in the United States, the largest outbreak since 1992. Most of the people who were infected were not vaccinated. This number dropped to 13 cases in 2020, followed by 49 cases in 2021 (Centers for Disease Control and Prevention, 2022). This overall decline is likely a consequence of social distancing measures put in place to address the COVID-19 pandemic.

An infection called toxoplasmosis, caused by a parasite harbored in the bodies of cattle, sheep, and pigs and in the intestinal tracts of cats, typically produces either no symptoms or symptoms like those of the common cold. In an expectant woman, however, especially in the second and third trimesters of pregnancy, it can cause fetal brain damage, severely impaired eyesight or blindness, seizures, miscarriage, stillbirth, or death of the baby. If the baby survives, there may be later problems, including eye infections, hearing loss, and learning disabilities. To avoid infection, expectant mothers should not eat raw or very rare meat, should wash hands and all work surfaces after touching raw meat, should peel or thoroughly wash raw fruits and vegetables, and should not dig in a garden where cat feces may be buried. Women who have a cat should have it checked for the disease and, if possible, should have someone else empty the litter box (Centers for Disease Control and Prevention, 2018).

In late 2019, a novel, highly infectious airborne respiratory coronavirus, **COVID-19**, became a **pandemic**, a disease that spreads across multiple countries or continents. Many **coronaviruses**, such as those that cause the common cold, are relatively innocuous. However, some have been responsible for large disease outbreaks. In previous coronavirus outbreaks, such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), pregnant women and their fetuses were at higher risk of death than nonpregnant women (Schwartz & Graham, 2020). The same is true for COVID-19. Pregnant women are at higher risk of complications, including preclampsia (dangerously high maternal blood pressure), preterm birth, stillbirth, neonatal intensive care unit admission, severe maternal illness, and maternal death (Wei et al., 2021; Adhikari & Spong, 2021). Fortunately, evidence suggests vertical transmission of the virus, in which the virus is passed from mother to baby prior to or during the birthing process, rarely occurs (Kotlyar et al., 2021). Moreover, although the recent development of COVID-19 vaccines limits the amount of data available, the benefits of vaccination in pregnant women overwhelmingly outweigh the risks. Additionally, preliminary research suggests infected and vaccinated pregnant mothers pass on antibodies to their babies, a finding that suggests those babies may later show resistance to the disease (Adhikari & Spong, 2021; Edlow et al., 2020).

**Maternal Emotional State** Some tension and worry during pregnancy are normal and do not increase risks of birth complications (Ravid et al., 2018). Moderate maternal anxiety may even spur organization of the developing brain. In one study, newborns whose mothers experienced moderate levels of both positive and negative stress showed



Your veterinarian can run an easy blood test on your cat to scan for the presence of the parasite. Alternatively, your own blood can be tested for antibodies to toxoplasmosis. If you were previously exposed, you are in the clear.

#### COVID-19

A novel coronavirus disease causing fatigue, loss of sense of smell, fever, and respiratory distress; the source of the 2019 pandemic.

#### pandemic

An epidemic or disease spread across multiple countries or continents.

#### coronaviruses

A large family of respiratory viruses, including those that cause the common cold, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and COVID-19.

**stress**

(1) Physical or psychological demands on a person or organism. (2) Response to physical or psychological demands.

signs of accelerated neurological development (DiPietro et al., 2010), and these gains may persist over time. There are also suggestions that mild prenatal stress may be associated with enhanced later resilience in the face of stressful events (Monaghan & Haussman, 2015).

However, these benefits exert a cost: atypical brain development (Johnson et al., 2015). A mother's self-reported **stress** and anxiety during pregnancy, when chronically high, has been associated with a more active and irritable temperament in newborns, negative emotionality and impulsivity, and behavioral disorders in early childhood (DiPietro et al., 2010; Van Den Bergh, 2017).

Depression may also have negative effects on development. Some studies report depressed women are more likely to give birth to a preterm child; however, other studies have not found this effect, and it remains controversial (Gentile, 2017; Staneva et al., 2015). Children born to depressed mothers are at elevated risk for developmental delays as toddlers, increased incidence of both internalizing (e.g., depression) and externalizing (e.g., impulsive behavior and aggression) symptoms as children, and elevated levels of violent and antisocial behaviors in adolescence (Gentile, 2017; Deave et al., 2008; Hay et al., 2010).

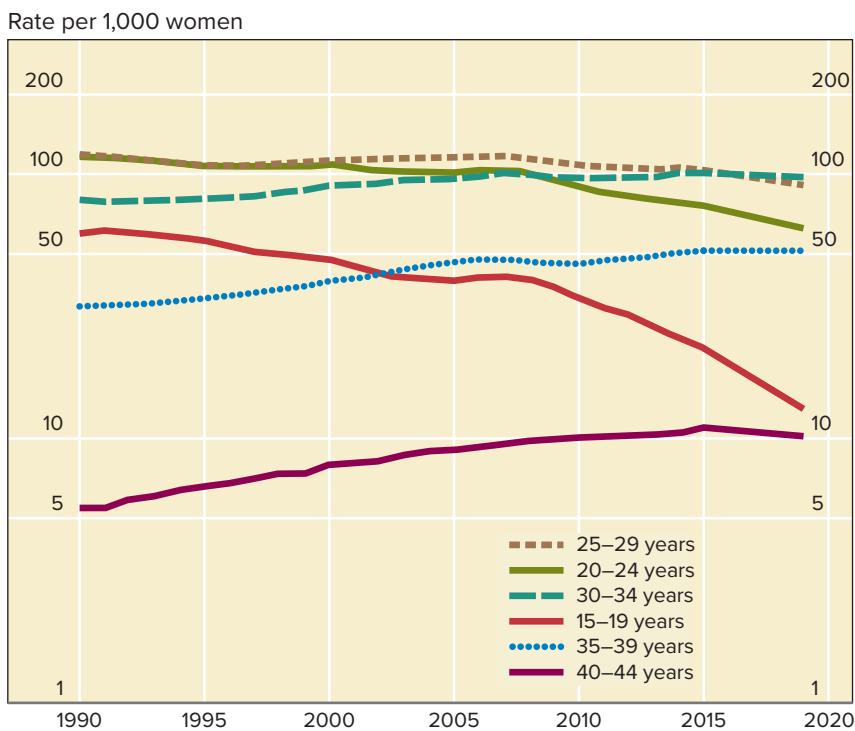
These findings have vast public health implications. Worldwide, approximately 20 percent of children and adolescents experience mental health issues, and there are suggestions the rate of internalizing disorders in girls is rising (Bor et al., 2014). These issues may be exacerbated in low- to middle-income countries, especially when good medical care is difficult to secure, and in countries plagued by war, violence, natural disasters, or poverty (Glover et al., 2018). Ongoing events such as the COVID-19 pandemic have also been associated with poor perinatal outcomes (Preis et al., 2021). Data on the influence of maternal emotional state suggest that prenatal care for women should also include components related to mental health and that psychopathology in the next generation could be reduced in this way.

**Maternal Age** Globally, the average age of mothers has declined from a high of slightly over 29 years in the 1950s to slightly over 28 years of age in 2020. However, in developed countries, average maternal age has risen and currently stands at approximately 30 years (United Nations, 2019). This trend appears to be driven by the postponement of first birth (OECD Family Database, 2019). Globally, age at first birth in developed countries has risen from 22 to 25 years to surpassing 30 years in some European countries. In less developed countries, women still tend to become mothers at earlier ages; however, even many of these countries have also demonstrated a trend toward delayed motherhood (Beaujouan & Sobotka, 2017).

In the United States, the mean age of mothers at first birth in 2019 was a record high of 27 years. This number, in part, illustrates a decline in the number of first births to teen and early-adult women rather than an proportional increase in births to older mothers. First birth rates for women aged 15 to 19 years showed a decline of 5 percent, and slightly older women showed somewhat smaller declines (Martin et al., 2021; Figure 9).

The chance of miscarriage or stillbirth rises with maternal age. Women age 30 to 35 are more likely to suffer complications due to diabetes, high blood pressure, or severe bleeding. There is also higher risk of premature delivery, retarded fetal growth, birth defects, and chromosomal abnormalities, such as Down syndrome. However, due to widespread screening and elective termination of affected pregnancies among older expectant mothers, the number of affected children in many countries has remained relatively stable over time, although this varies by region (Loane et al., 2013). For example, women in the United States, the United Kingdom, the Netherlands, and Singapore are more likely to chose to continue a pregnancy when non-invasive prenatal tests suggested a high likelihood of having an affected child, whereas women in China, Hong Kong, Taiwan, France, and Spain are far less likely to do so (Hill et al., 2017).

Adolescence, too, carries risk. Adolescent mothers tend to have premature or underweight babies—perhaps because a young girl's still-growing body consumes vital nutrients



**FIGURE 9**  
US Birthrates, by Age of Mother, 1990–2019

Source: Martin et al. (2021).

the fetus needs or, more likely, because of inadequate or missing prenatal care (Malabarey et al., 2012). These newborns are at heightened risk of death in the first month, disabilities, or health problems. While teen birthrates in the United States have been in a steady, long-term decline, they are still among the highest of industrialized nations (Maddow-Zimet & Kost, 2021). We discuss teen pregnancy in more detail in Chapter 12.

**Outside Environmental Hazards** Prenatal development can also be affected by air pollution, chemicals, radiation, extremes of heat and humidity, and other environmental factors. Pregnant women who regularly breathe air that contains high levels of fine combustion-related particles such as gas fumes and smoke are more likely to bear infants who are premature or undersized (Bai et al., 2021), have chromosomal or developmental abnormalities (Xiong et al., 2019), or are at risk for cognitive and psychomotor delays (Xu et al., 2016). Similarly, exposure to high concentrations of disinfection by-products is associated with low birth weight and congenital abnormalities (Nieuwenhuijsen et al., 2013), and prenatal exposure to organophosphate pesticides is associated with an increased risk of developing neurodevelopmental disorders (Sapbamrer & Hongsibsong, 2019).

Fetal exposure to low levels of environmental toxins, such as lead, mercury, and dioxin, as well as nicotine and ethanol, may help explain the sharp rise in asthma, ear infections, and allergies (Parker-Lalorio et al., 2018). Childhood cancers, including leukemia, have been linked to pregnant mothers' drinking chemically contaminated groundwater (Boyles, 2002) and use of home pesticides (Menegaux et al., 2006). Infants exposed prenatally even to low levels of lead are born smaller and shorter than unexposed babies (Xie et al., 2013) and tend to show IQ deficits during childhood (Schnaas et al., 2006).

In utero exposure to radiation has been linked to miscarriage, intellectual disability, small head size, increased cancer risk, and lowered IQ. The risk of problems from the single use of medical diagnostic procedures is low. However, in nuclear disasters such



From the 1920s to the 1970s, a shoe-fitting machine that enabled customers to view their X-rayed feet within shoes was a common gimmick in shoe stores. Now that we know how damaging X-rays are for both adults and children, these machines are no longer in use.

as the Chernobyl or Fukushima Daiichi nuclear plant accidents in 1996 and 2011, respectively, where radiation exposure is high, pregnant women are likely to be at extremely elevated risk for adverse pregnancy outcomes (Groen et al., 2012).

## ENVIRONMENTAL INFLUENCES: PATERNAL FACTORS

### checkpoint can you... ...summarize recommendations for an expectant mother's diet?

- ▶ Summarize recommendations for an expectant mother's diet?
- ▶ Discuss effects on the developing fetus of a parent's use of prescription drugs, alcohol, tobacco, caffeine, marijuana, cocaine, and methamphetamine?
- ▶ Assess the risks of maternal illnesses, anxiety, stress, and advanced age on pregnancy and the fetus?

Although women have a much larger influence on a pregnancy, there is increasing evidence that a father's lifestyle or characteristics may also exert effects on a child. High stress, a poor diet, or exposure to environmental toxicants such as heavy metals or pesticides can cause epigenetic changes and result in abnormal or poor-quality sperm (Braun et al., 2017; Chan et al., 2018). For example, offspring of men stationed on military vessels were at elevated risk of infant mortality and their mothers were at risk for dangerously high blood pressure during pregnancy (Baste et al., 2012). Similarly, babies whose fathers had diagnostic X-rays or who had high lead exposure at work tended to have low birth weight and be born prematurely (Chen et al., 2018).

Smoking can also be problematic. Men who smoke have an increased likelihood of transmitting genetic abnormalities (Beal et al., 2017) and heart defects (Deng et al., 2013). Moreover, a pregnant woman's exposure to the father's secondhand smoke has been linked with asthma (Simons et al., 2014), attentional problems (Langley et al., 2012), low birth weight (Zhou et al., 2014), and cancer in childhood (Cao et al., 2020).

Older fathers may be a significant source of birth defects due to damaged or deteriorated sperm. Birthrates involving older fathers have risen in the United States for all races and across educational levels (Khandwala et al., 2017). Having an older father is a risk factor for schizophrenia (Lan et al., 2020), as is having, at least for male children, a young father (Miller et al., 2010). Advanced age of the father also may be a factor in bipolar disorder and autism and related disorders (Andersen & Urhoj, 2017; Malaspina et al., 2015).

## Monitoring and Promoting Prenatal Development

Not long ago, almost the only decision parents had to make about their babies before birth was the decision to conceive; most of what happened in the intervening months was beyond their control. Now scientists have developed an array of tools to assess an unborn baby's progress and well-being and even to intervene to correct some abnormal conditions (Table 5).

There are several types of noninvasive screening techniques. In ultrasound screenings, high-frequency sound waves are used to provide a picture of the developing fetus. This may be supplemented with maternal blood tests, in which the mother's blood is tested for hormone levels associated with fetal abnormalities. Another assessment technique is a prenatal cell-free DNA scan, in which fetal DNA is extracted from the mother's blood and tested. These tests have been shown to be useful for early detection of genetic problems, although they are not always definitive (Norwitz & Levy, 2013).

If a noninvasive test indicates elevated risk, more invasive assessment techniques are also available. Amniocentesis is a procedure in which a sample of amniotic fluid is withdrawn for analysis. In chorionic villus sampling, tissue from the membrane surrounding the fetus is removed and analyzed. Both procedures provide definitive evidence of a genetic issue. Contrary to previous findings, amniocentesis and chorionic villus sampling (which can be used earlier in pregnancy) do not seem to confer additional risk. When pregnant women who receive either procedure are compared to pregnant women with a similar risk profile who do not receive either procedure, there is no increase in miscarriage rates (Salomon et al., 2019). Embryoscopy, the insertion of a tiny viewing scope into the mother's uterus through the abdominal wall for a direct look at the embryo,

**TABLE 5** Prenatal Assessment Techniques

Technique	Description	Uses and Advantages	Risks and Notes
<b>Ultrasound (sonogram)</b>	High-frequency sound waves directed at the mother's abdomen produce a picture of fetus in uterus.	Monitor fetal growth, movement, position, and form; detect major structural abnormalities or fetal death; assess amniotic fluid volume; judge gestational age; detect multiple pregnancies	Done routinely in many places
<b>Embryoscopy, fetoscopy</b>	Tiny viewing scope is inserted in woman's abdomen to view embryo or fetus.	Guide fetal blood transfusions and bone marrow transplants and assist in diagnosis of nonchromosomal genetic disorders	Riskier than other prenatal diagnostic procedures
<b>Amniocentesis</b>	Sample of amniotic fluid containing fetal cells is withdrawn under guidance of ultrasound and analyzed.	Usually performed in women aged 35 and older, can detect chromosomal disorders and certain genetic or multifactorial defects; more than 99 percent accuracy rate	Normally not performed before 15 weeks' gestation, small (0.5–1%) added risk of fetal loss or injury; can be used for sex-screening of unborn babies
<b>Chorionic villus sampling (CVS)</b>	Tissues from chorionic villi (projections of membrane surrounding fetus) are removed and analyzed.	Early diagnosis of birth defects and disorders, can be performed between 10 and 12 weeks' gestation	Should not be performed before 10 weeks' gestation; may be slightly riskier than amniocentesis
<b>Preimplantation genetic diagnosis</b>	After in vitro fertilization, a sample cell is removed from the blastocyst and analyzed.	Can avoid transmission of genetic defects or predispositions known to run in the family; a defective blastocyst is <i>not</i> implanted in uterus	No known risks
<b>Umbilical cord sampling (cordocentesis, or fetal blood sampling)</b>	Needle guided by ultrasound is inserted into blood vessels of umbilical cord.	Allows direct access to fetal DNA for diagnostic measures, including blood disorders and infections, and therapeutic measures such as blood transfusions	Fetal loss or miscarriage is reported in 1–2% of cases; increases risk of bleeding from umbilical cord and fetal distress.
<b>Maternal blood test (including prenatal cell-free DNA scans)</b>	A sample of the prospective mother's blood is tested for alpha fetoprotein or for fetal DNA.	May indicate defects in formation of brain or spinal cord (anencephaly or spina bifida); also can predict Down syndrome and other abnormalities	No known risks, but false negatives are possible. Ultrasound and/or amniocentesis is needed to confirm suspected conditions.

Sources: Chodirker et al. (2001); Cicero et al. (2001); Cunniff & the Committee on Genetics (2004); Kurjak et al. (1999); Verlinsky et al. (2002).

can help diagnose nonchromosomal disorders, and umbilical cord sampling allows direct access to fetal DNA in the blood vessels of the umbilical cord for diagnosis.

Screening for defects and diseases is only one important reason for early prenatal care. Early, high-quality prenatal care, which includes educational, social, and nutritional services, can help prevent maternal or infant death and other birth complications. It can provide first-time mothers with information about pregnancy, childbirth, and infant care and help poor mothers access health care and social services. The amount of prenatal care received by a woman is linearly related to positive outcomes (Partridge et al., 2012).

In the United States, prenatal care is widespread but not universal as in many European countries, and it lacks uniform national standards and guaranteed financial coverage. However, despite the availability of prenatal care, rates of low birth weight (8.51 percent) and preterm delivery (10.48 percent) are still high (Driscoll et al., 2022).

Historically, rates of low birth weight and premature birth have continued to rise. Why? One answer is the increase in multiple births, which often are early births, with



*Women who crave sweets while pregnant are more likely to give birth to a girl, whereas those who crave fruits and vegetables while pregnant are more likely to have a boy (Hainutdzinava et al., 2017).*

## PRENATAL CARE AROUND THE WORLD

The United Nations (2020) estimates that approximately 140 million babies are born worldwide each year. About 810 women die each day from childbirth-related complications, with 99 percent of these deaths occurring in low-resource areas (World Health Organization, 2019). Hemorrhage, hypertensive disorders, and infection are responsible for more than half of all maternal deaths; most of these deaths could have been prevented with proper education and prenatal care (UNICEF Millennium Development Goals, 2015).

Sub-Saharan Africa and Southern Asia account for the bulk of maternal deaths. The risk of death following pregnancy and childbirth is highest for young mothers, especially those under 15 years of age. Moreover, because women in less developed countries typically begin having children at a younger age, their average number of pregnancies, and hence their lifetime risk, is higher (World Health Organization, 2019).

Standards of prenatal care are not equal worldwide. In high- and middle-income countries, upwards of 90 percent of pregnant women receive prenatal care. In low-income countries, only 40 percent of women receive the minimum World Health Organization standard of four visits. Poverty often limits both access and availability of services. Women living in remote areas have limited access to health care; sometimes the distance to facilities is too great,

there are not enough skilled workers to serve the population, or cultural beliefs and practices interfere with the provision of care (World Health Organization, 2019). Moreover, there are indications the COVID-19 pandemic has led to a decline in the utilization of prenatal services, suggesting recent improvement in fetal and maternal health may be compromised (Townsend et al., 2021).

The maternal/infant mortality rate has been declining over the past 20 years but is still too high. An estimated 2 million babies were stillborn, and another 2.4 million died within the first month of life in 2016 (UNICEF, 2020). Globalized efforts by the WHO, the Centers for Disease Control and Prevention, Save the Children, Doctors without Borders, Care, UNICEF, and many others are helping to make a difference. All women need access to prenatal care, education, family planning, and support during pregnancy and the weeks following childbirth.



In a world of limited resources, we cannot help everyone. What proportion of services should be provided to pregnant people versus other groups? What proportion of US funds should be used to help our own population versus global efforts?

### checkpoint can you . . .

- Describe seven techniques for identifying defects or disorders prenatally?
- Discuss possible reasons for disparities in utilization of prenatal care?
- Tell why early, high-quality prenatal care is important and why preconception care is needed?

heightened risk of death within the first year. Fortunately, multiple births appear to be declining in most areas of the United States (Martin & Osterman, 2019).

A second answer is that the benefits of prenatal care are not evenly distributed. Although usage of prenatal care has grown, especially among ethnic groups that have tended not to receive early care, the women most at risk of bearing low-birth-weight babies—teenage and unmarried women, those with little education, and some minority women—are still least likely to receive it (Partridge et al., 2012; see Window on the World).

Good prenatal care can give every child the best possible chance for entering the world in good condition to meet the challenges of life outside the womb—challenges we discuss in the next chapter.

# summary and key terms

## Conceiving New Life

- Fertilization, the union of an ovum and a sperm, results in the formation of a one-celled zygote, which then duplicates itself by cell division.
- Multiple births can occur either by the fertilization of two ova (or one ovum that has split) or by the splitting of one fertilized ovum. Higher multiple births result from either one of these processes or a combination of the two.
- Dizygotic (fraternal) twins have different genetic makeups and may be of different sexes. Although monozygotic (identical) twins typically have much the same genetic makeup, they may differ in temperament or other respects.  
**fertilization** (47)  
**zygote** (47)  
**assisted reproductive technology** (49)  
**dizygotic twins** (49)  
**monozygotic twins** (49)

## Mechanisms of Heredity

- The basic functional units of heredity are the genes, which are made of deoxyribonucleic acid (DNA). DNA carries the biochemical instructions, or genetic code, that governs the development of cell functions. Each gene is located by function in a definite position on a particular chromosome. The complete sequence of genes in the human body is called the human genome.  
**deoxyribonucleic acid (DNA)** (51)  
**genetic code** (51)  
**chromosomes** (51)  
**genes** (51)  
**human genome** (51)  
**mutations** (51)
- At conception, each normal human being receives 23 chromosomes from the mother and 23 from the father. These form 23 pairs of chromosomes—22 pairs of autosomes and 1 pair of sex chromosomes. A child who receives an X chromosome from each parent is genetically

female. A child who receives a Y chromosome from the father is genetically male.

- The simplest patterns of genetic transmission are dominant and recessive inheritance. When a pair of alleles are the same, a person is homozygous for the trait; when they are different, the person is heterozygous.

**autosomes** (51)

**sex chromosomes** (51)

**alleles** (52)

**homozygous** (52)

**heterozygous** (52)

**dominant inheritance** (52)

**recessive inheritance** (52)

- Most normal human characteristics are the result of polygenic or multifactorial transmission. Except for most monozygotic twins, each child inherits a unique genotype. Dominant inheritance and multifactorial transmission explain why a person's phenotype does not always express the underlying genotype.

**polygenic inheritance** (53)

- The epigenetic framework controls the functions of particular genes; it can be affected by environmental factors.

**phenotype** (53)

**genotype** (53)

**multifactorial transmission** (53)

**epigenesis** (53)

- Birth defects and diseases may result from simple dominant, recessive, or sex-linked inheritance, from mutations, or from genome imprinting. Chromosomal abnormalities also can cause birth defects.
- Through genetic counseling, prospective parents can receive information about the mathematical odds of bearing children with certain defects.
- Genetic testing involves risks as well as benefits.

**incomplete dominance** (55)

**sex-linked inheritance** (56)

**Down syndrome** (57)

**genetic counseling** (58)

## Studying the Influences of Heredity and Environment

- Research in behavioral genetics is based on the assumption that the relative influences of heredity and environment within a population can be measured statistically. If heredity is an important influence on a trait, genetically closer persons will be more similar in that trait. Family studies, adoption studies, and studies of twins enable researchers to measure the heritability of specific traits.
- The concepts of reaction range, canalization, genotype-environment interaction, genotype-environment correlation (or covariance), and niche-picking describe ways in which heredity and environment work together.
- Siblings tend to be more different than alike in intelligence and personality. According to some behavioral geneticists, heredity accounts for most of the similarity, and nonshared environmental effects account for most of the difference.  
**behavioral genetics** (59)  
**heritability** (59)  
**concordant** (59)  
**reaction range** (60)  
**canalization** (60)  
**genotype-environment interaction** (61)  
**genotype-environment correlation** (61)  
**niche-picking** (61)  
**nonshared environmental effects** (62)
- Obesity, longevity, intelligence, temperament, and other aspects of personality are influenced by both heredity and environment.
- Schizophrenia is a highly heritable neurological disorder that also is environmentally influenced.  
**obesity** (62)  
**temperament** (63)  
**schizophrenia** (63)

## Prenatal Development

- Prenatal development occurs in three stages of gestation: the germinal, embryonic, and fetal stages.
- Severely defective embryos often are spontaneously aborted during the first trimester of pregnancy.
- As fetuses grow, they move less but more vigorously. Swallowing amniotic fluid, which contains substances from the mother's body, stimulates taste and smell. Fetuses seem able to hear, exercise sensory discrimination, learn, and remember.  
**gestation** (64)  
**gestational age** (64)  
**cephalocaudal principle** (65)  
**proximodistal principle** (65)  
**germinal stage** (65)  
**implantation** (66)  
**embryonic stage** (67)  
**spontaneous abortion** (67)  
**fetal stage** (69)  
**ultrasound** (69)  
**neurons** (69)
- The developing organism can be greatly affected by its prenatal environment. The likelihood of a birth defect may depend on the timing and intensity of an environmental event and its interaction with genetic factors.
- Important environmental influences involving the mother include nutrition, smoking, intake of alcohol or other drugs, transmission of maternal illnesses or infections, maternal stress, anxiety, or depression, maternal age and physical activity, and external environmental hazards, such as chemicals and radiation. External influences also may affect the father's sperm.  
**teratogen** (70)  
**fetal alcohol syndrome (FAS)** (72)  
**acquired immune deficiency syndrome (AIDS)** (74)  
**COVID-19** (75)  
**pandemic** (75)  
**coronaviruses** (75)  
**stress** (76)

## Monitoring and Promoting Prenatal Development

- Ultrasound, amniocentesis, chorionic villus sampling, fetoscopy, preimplantation genetic diagnosis, umbilical cord sampling, and maternal blood tests can be used to determine whether an unborn baby is developing normally.
- Early, high-quality prenatal care is essential for healthy development. It can lead to detection of defects and disorders and, especially if begun early and targeted to the needs of at-risk women, may help reduce maternal and infant death, low birth weight, and other birth complications.
- Racial/ethnic disparities in prenatal care may be a factor in disparities in low birth weight and perinatal death.

Design elements: (Butterfly Icon): Stockbyte/Getty Images; (World Icon): janrysavy/Getty Images

## outline

Childbirth, Culture, and Change

The Birth Process

The Newborn Baby

Complications of Childbirth

Survival and Health

Early Physical Development

Motor Development

## learning objectives

Specify how childbirth has changed in developed countries.

Describe the birth process.

Describe the adjustment of a healthy newborn and the techniques for assessing its health.

Explain potential complications of childbirth and the prospects for infants with complicated births.

Identify factors affecting infants' chances for survival and health.

Discuss the patterns of physical growth and development in infancy.

Describe infants' motor development.

# Birth and Physical Development during the First Three Years



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## did you know?

- Pregnant women infected with COVID-19 are more likely to experience birth complications or give birth to a low-birth-weight child.
- The first 1,000 days of life are a critical period for healthy physical, cognitive, and social development.
- Infants can categorize faces on the basis of race and tend to prefer own-race faces.

*In this chapter, we discuss how pregnancy and childbirth customs have varied over time and place. We describe how babies come into the world, how newborn babies look, and how their body systems work. We discuss ways to safeguard their lives and health and observe their rapid early physical development. We see how infants become busy, active toddlers and how caregivers can foster healthy growth and development. We also discuss the disparities in care, resources, and outcomes in diverse groups in the United States and the world.*



**L**et choice whisper in your ear and love murmur  
in your heart. Be ready. Here comes life.

—Maya Angelou (1928–2014)

## Childbirth, Culture, and Change

Across all cultures, birth and the surrounding period as a whole are viewed not only as a time of joy but also as a time of great vulnerability. Perhaps not surprisingly, birth practices tend to be ritualized and relatively standard across women within the bounds of each particular culture (Lozoff et al., 1988). Attempts to exert control over the process, via either rituals or medicalization, are common (Behruzi et al., 2013).

Across many cultures, giving birth is viewed through a spiritual or religious lens, a perspective that can help women manage the pain of labor (Yadollahi et al., 2018). Laboring women are almost always assisted by others. In traditional societies, these others are most often family members or other well-known associates. In modern societies, this assistance is most often medicalized (Liamputpong, 2007). Additionally, customs or beliefs meant to ensure positive outcomes for mother and baby are common across both traditional and industrialized cultures and often take on a moral tone (Lozoff et al., 1988). For instance, seclusion of the new mother and infant is a common practice, at times described as a precaution against evil spirits and demons and in other situations as a response to the pollution associated with the birthing process (Holmes, 1994).

Despite these commonalities, wide variations exist. Customs surrounding childbirth reflect a culture's beliefs, values, and resources. In the !Kung San of the Kalahari Desert, laboring women seek out a favorite location in the bush—alone—and are expected to be brave, as fear is believed to lead to a difficult and painful delivery (Konner & Shostak, 1987). A Mayan woman in Yucatan gives birth in the hammock she sleeps in every night; both the father-to-be and a midwife are expected to be present. To evade evil spirits, mother and child remain at home for a week (Jordan, 1993). In northern Thailand, the husband assists his pregnant partner and her attendant, boils water, and cleans up after the birth (Liamputpong, 2007). By contrast, among the Ngoni in East Africa, although women are assisted by attendants, men are excluded. Should the birth prove difficult, men are pressured to divulge any adulterous relationships, believed to be a contributing factor in difficult deliveries (Barnes, 1949). Adulterous relationships are also blamed for difficult deliveries in the Mende of Sierra Leone; however, the laboring woman is the one suspected of liaisons as competing sperm are thought to be dangerous for the pregnancy (Holmes, 1994).

The postpartum experience also varies. Before the twentieth century, peasant mothers in Europe and the United States were expected to be back at work in the fields within a few hours or days of giving birth (Fontanel & d'Harcourt, 1997). By contrast, in southeast Thailand, traditional beliefs about the postpartum period involve rest for the new mother and “regaining heat” for the body by consuming hot drinks, taking hot baths, and lying by the fire (Kaewesarn et al., 2003). Tamil mothers in India enter a birthing house for delivery and stay for 31 days before emerging for a ritual bath for the mother and shaving of the infant’s head (McGilvray, 1982). But in some areas of rural Thailand, a new mother generally resumes normal activity within a few hours of giving birth (Gardiner & Kozmitzki, 2005).



The Guinness Book of Records reports that the record for the highest number of births from one woman is held by a Russian woman who, from 1725 to 1765, gave birth to 16 sets of twins, 7 sets of triplets, and 4 sets of quadruplets over the course of 27 pregnancies.

## FIGURE 1

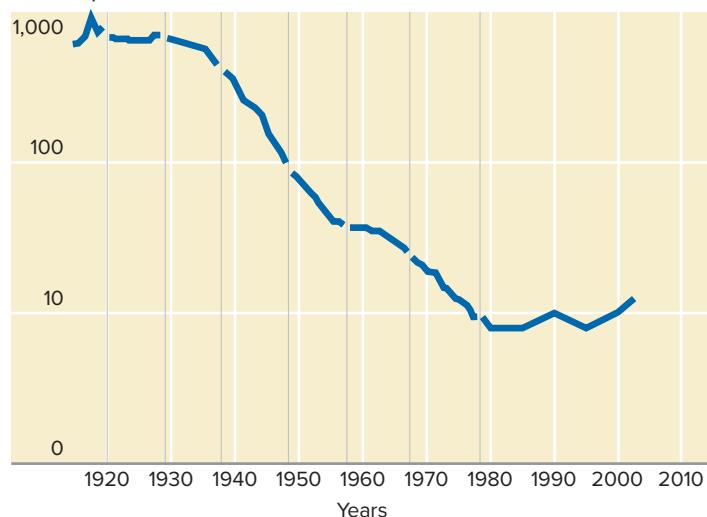
### US Maternal Mortality Rates

Since 1915, the maternal mortality rate in the United States has dropped from 607.9 deaths per 100,000 live births for the birth registration area to 12.1 deaths per 100,000 live births in 2003.

Prior to 1933, data for birth registration states only. Line breaks are shown between successive *International Classification of Diseases* revisions. Since 2007, no new data have been collected.

Sources: National Center for Health Statistics (2007); Clark, S. L., (2012).

Deaths per 100,000 live births



Childbirth also varies across historical time periods. Historically, childbirth has often been “a struggle with death” (Fontanel & d’Harcourt, 1997) for both mother and baby. In seventeenth and eighteenth century France, a woman had a 1 in 10 chance of dying while or shortly after giving birth. Thousands of babies were stillborn, and 1 out of 4 born alive died during the 1st year. At the end of the nineteenth century in England and Wales, an expectant mother was almost 50 times more likely to die in childbirth than a woman giving birth in modern times (Saunders, 1997). Childbirth in Europe and the United States followed similar patterns in the late 1800s (Fontanel & d’Harcourt, 1997). At the start of the twentieth century, childbirth began to be professionalized in the United States, at least in urban settings. The growing use of maternity hospitals led to safer, more antiseptic conditions for childbirth, which reduced mortality for women (Figure 1). In 1900, only 5 percent of US deliveries occurred in hospitals; by 1920, in some cities 65 percent did (Scholten, 1985). A similar trend took place in Europe. Most recently, in the United States, 98.6 percent of babies were born in hospitals, and 91 percent of births were attended by physicians (Martin et al., 2019).

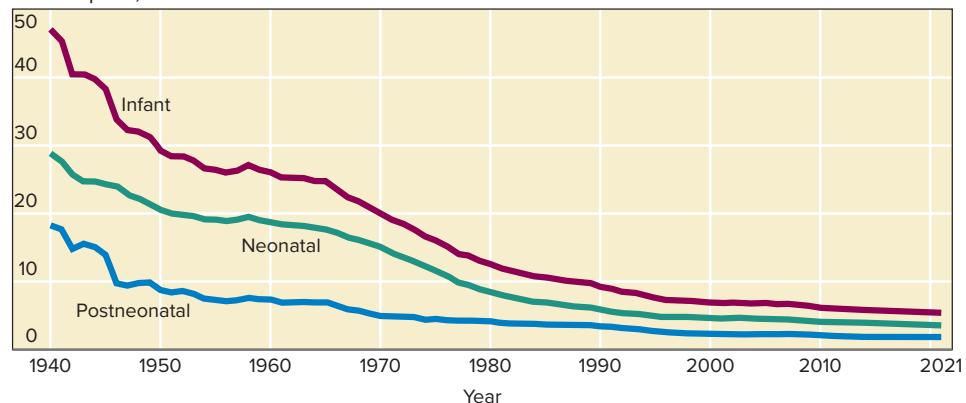
The dramatic reductions in risks surrounding pregnancy and childbirth in industrialized countries are largely due to the availability of antibiotics, blood transfusions, safe anesthesia, improved hygiene, and drugs for inducing labor. In addition, improvements

## FIGURE 2

### US Infant Mortality Rates, 1940–2021

The US infant mortality rate has decreased from 47.0 infant deaths per 1,000 live births in 1940 to 5.41 in 2021. During the same period, the neonatal rate decreased from 28.8 to 3.56 deaths per 1,000 live births, and the postneonatal rate decreased from 18.3 to 1.85 deaths per 1,000 live births.

Deaths per 1,000 live births



Source: Driscoll & Ely (2021).

in prenatal assessment and care make it far more likely that a baby will be born healthy. In 1940, there were 47.0 infant (from birth to 1 year of age) deaths per 1,000 live births (Figure 2); by 2020, this rate had decreased to 5.42 infant deaths per 1,000 live births. Postneonatal (from 28 days to 1 year of age) survival rates have also increased. In 1940, the postneonatal death rate was 18.3 infant deaths per 1,000 live births, a number that fell to 1.85 deaths in 2017 (Kochanek et al., 2019; Driscoll & Ely, 2021). However, maternal mortality in the United States has changed little in the past 50 years and shows signs of a recent uptick (Singh, 2021).

The United States has the highest maternal mortality rate among similar developed countries (Tikkanen et al., 2020). Among the nearly 4 million US women who give birth yearly, more than 50,000 experience a life-threatening complication (Lu, 2018). This is likely due to a variety of factors, including increases in maternal age, prepregnancy obesity, preexisting medical conditions, and cesarean delivery. Black women, obese women, those with difficult medical histories, those who had previous cesarean deliveries, and those who had several children are at elevated risk of cardiovascular events, infection, sepsis, hemorrhage, and other dangerous complications. Race and ethnicity are significant risk factors; the mortality ratio (the number of pregnancy-related deaths per 100,000 women) is much higher in African American (41.7) and American Indian/Alaskan Native women (28.3) than in White (13.4) and Hispanic (11.6) women (Centers for Disease Control and Prevention, 2020).

Childbirth is also a dangerous endeavor in many developing countries, especially sub-Saharan Africa and South Asia (World Health Organization, 2019). There, 60 million women deliver at home each year without the benefit of skilled care, and until recently, more than 500,000 women and 4 million newborns died in or shortly after childbirth (Sines et al., 2007). However, there are promising trends. Estimates suggest that about 295,000 women died during and following pregnancy and childbirth in 2017, a number that, albeit high, nonetheless represents a decline of almost 38 percent since 2000 (World Health Organization, 2019).

While childbirth is undoubtedly safer with the advances of modern medicine, the medicalization of childbirth has nonetheless had social and emotional costs that some women are rejecting. Today a small but growing percentage of women in developed countries are going back to the intimate, personal experience of home birth (MacDorman & Declercq, 2019). Home births are usually attended by a trained nurse-midwife, ideally with the resources of medical science close at hand. Some studies suggest that planned home births with speedy transfer to a hospital in case of need can be as safe as hospital births for low-risk deliveries attended by skilled, certified midwives or nurse-midwives (American College of Nurse-Midwives, 2016). However, complications can arise suddenly, even in low-risk pregnancies. Research shows the infant mortality rate, although low, is more than three times higher for home births than for hospital births (Grünebaum et al., 2020).

### checkpoint can you...

- Identify two ways childbirth has changed in developed countries and tell why it is less risky than it once was?
- Compare advantages of various settings for childbirth?

## The Birth Process

Labor is an apt term for the process of giving birth. Birth is hard work for both mother and baby. What brings on labor is a series of uterine, cervical, and other changes called parturition. **Parturition** is the act or process of giving birth, and it typically begins about 2 weeks before delivery.

The uterine contractions that expel the fetus begin—typically about 266 days after conception—as a tightening of the uterus. A woman may have felt false contractions (known as Braxton-Hicks contractions) at times during the final months of pregnancy or even as early as the second trimester, when the muscles of the uterus tighten for up to 2 minutes. In comparison with the relatively mild and irregular Braxton-Hicks contractions, real labor contractions are more frequent, rhythmic, and painful, and they increase in frequency and intensity.

### parturition

The act or process of giving birth.

## STAGES OF CHILDBIRTH

Labor takes place in three overlapping stages (Figure 3).

The first stage, dilation of the cervix, is the longest, typically lasting 12 to 14 hours for a woman having her first child. In subsequent births, the first stage tends to be shorter. During this stage, regular and increasingly frequent uterine contractions—15 to 20 minutes apart at first—cause the cervix to shorten and dilate, or widen, in preparation for delivery. Toward the end of the first stage, contractions occur every 2 to 5 minutes. This stage lasts until the cervix is fully open (10 centimeters, or about 4 inches) so the baby can descend into the birth canal.

The second stage, descent and emergence of the baby, typically lasts up to an hour or two. It begins when the baby's head begins to move through the cervix into the vaginal canal, and it ends when the baby emerges completely from the mother's body. At the end of this stage, the baby is born but is still attached to the placenta in the mother's body by the umbilical cord, which must be cut and clamped.

The third stage, expulsion of the placenta, lasts between 10 minutes and 1 hour. During this stage, the placenta and the remainder of the umbilical cord are expelled from the mother.

## ELECTRONIC FETAL MONITORING

### electronic fetal monitoring

Mechanical monitoring of fetal heartbeat during labor and delivery.

**Electronic fetal monitoring** can be used to track the fetus's heartbeat during labor. Monitoring is most commonly done with the use of sensors attached to the woman's midsection and held in place with an electric belt. The sensors monitor heart rate and alert medical personnel of potentially problematic changes. The procedure was used in 89 percent of live births in the United States in 2004 (Chen et al., 2013).

Electronic fetal monitoring can provide valuable information in high-risk deliveries. However, monitoring can have drawbacks if it is used routinely in low-risk pregnancies. The use of continuous EFM in a healthy, low-risk pregnancy is associated with an *increase* in risk for mother and baby. This may be because EFM has a high false-positive rate, suggesting that fetuses are in trouble when they are not. Such warnings may prompt doctors to deliver by the riskier cesarean method rather than vaginally. Why, then, do doctors continue to use it in almost all pregnancies? Generally, concerns regarding possible malpractice lawsuits, particularly if a child is born with cerebral palsy, are believed to be the driving force behind the overuse of EFM (Spector-Bagdady et al., 2017).

### FIGURE 3

#### The Three Stages of Childbirth

- (a) During the first stage of labor, a series of increasingly stronger contractions dilates the cervix, the opening to the mother's womb.
- (b) During the second stage, the baby's head moves down the birth canal and emerges from the vagina.
- (c) During the brief third stage, the placenta and umbilical cord are expelled from the womb. Then the cord is cut.



## VAGINAL VERSUS CESAREAN DELIVERY

The usual method of childbirth is vaginal delivery. Alternatively, a cesarean delivery may be performed when labor progresses too slowly, when the fetus is in the breech (feet or buttocks first) or transverse (lying crosswise in the uterus) position, or when the mother is bleeding vaginally. Physicians' fear of malpractice suits and women's preferences also may play a part in the choice of cesarean deliveries, as may the increased revenue hospitals generate when a woman has a cesarean rather than a vaginal birth. Additionally, the rise in maternal age has contributed to rising cesarean rates.

In the United States, the cesarean birth rate peaked in 2009 at 32.9 percent. Although still high, the rate in 2020 dropped slightly to 31.8 percent (Hamilton et al., 2022). Internationally, the rate of cesarean deliveries is rising. Current data indicates cesarean birth rates are 21.1 percent globally, ranging from 5 percent in sub-Saharan Africa to 42.8 percent in Latin American and Caribbean. In many countries, the overuse of cesareans exists in concert with unsafe cesarean or unmet needs for cesarean delivery (Betran et al., 2021). For example, women in low- and middle-income countries are at higher risk of mortality after a cesarean delivery than those in high-income countries (Sobhy et al., 2019).

Cesarean delivery comes with both risks and benefits. Although cesarean deliveries reduce the risk of urinary incontinence and pelvic organ prolapse (where weakened muscles allow one or more of the pelvic organs to drop into or press out of the vagina) in comparison to vaginal delivery (Keag et al., 2018), they carry significant risks of serious complications for the mother. Cesarean delivery can lead to bleeding, uterine rupture, and heightened risks of problems in future pregnancies. For example, the use of cesarean is associated with placental abnormalities in subsequent pregnancies (Klar & Michels, 2014). Cesarean deliveries also deprive the baby of important benefits of normal birth, including the surge of hormones that clears the lungs of excess fluid, the mobilization of stored fuel to nourish cells, and the movement of blood to the heart and brain (Lagercrantz & Slotkin, 1986). Moreover, there are indications that cesarean delivery alters newborn physiology and may put children at risk for future obesity and asthma (Keag et al., 2018; Sandall et al., 2018) by negatively affecting the stress response system (Martinez et al., 2020).

In 2010, the American College of Obstetrics and Gynecology issued guidelines supporting an attempted trial of labor for vaginal birth after cesarean (VBAC) for women who had a previous low transverse uterine incision and who were low risk otherwise (Grady, 2010). A VBAC is associated with a greater (though still low) risk of complications, including uterine rupture, unplanned hysterectomy, and maternal death (Habak & Kole, 2021; Curtin et al., 2015). However, other research shows that there are also risks associated with repeat cesarean deliveries, including postpartum endometriosis (a painful condition in which uterine cells are found outside of the uterus), complications related to the use of anesthesia, bladder or bowel injury, or hysterectomy (Fong et al., 2016; Zwergel & von Kaisenberg, 2019). Overall, women who attempt a trial of labor following one or two cesarean deliveries are successful 60 to 80 percent of the time (Habak & Kole, 2021) and represented 13.9 percent of total births in 2019 (Osterman et al., 2022). VBAC is not recommended for home births or women who have conditions that make it less likely to be successful, such as advanced age, obesity, diabetes, high blood pressure, a very large baby, or a previous cesarean that was the result of a failure of the cervix to dilate (Wu et al., 2019).

## MEDICATED VERSUS NONMEDICATED DELIVERY

For centuries, pain was considered an unavoidable part of giving birth. Then, in the mid-nineteenth century, sedation with ether or chloroform became common practice as more births took place in hospitals (Fontanel & d'Harcourt, 1997).

During the twentieth century, several alternative methods of **natural childbirth** or **prepared childbirth** were developed. These methods minimize or eliminate the use of

### cesarean delivery

Delivery of a baby by surgical removal from the uterus.



*There are patterns in the time of day when birth occurs. Cesarean deliveries are most common between 8:00 am and noon. Vaginal deliveries are most common during late evening and early morning. And, births in out-of-hospital settings, perhaps reflecting a more natural delivery pattern, are most likely to occur in the early morning (Mathews & Curtin, 2015).*

### natural childbirth

Method of childbirth that seeks to prevent pain by eliminating the mother's fear through education about the physiology of reproduction and training in breathing and relaxation during delivery.

### prepared childbirth

Method of childbirth that uses instruction, breathing exercises, and social support to induce controlled physical responses to uterine contractions and reduce fear and pain.

In 1914, President Woodrow Wilson proclaimed Mother's Day a national holiday.



#### doula

An experienced mentor who furnishes emotional support and information for a woman during labor.



A doula, or experienced helper, stays at a woman's bedside throughout labor and provides emotional support. Research has found that women attended by doula tend to have shorter labor and easier deliveries.

Andersen Ross/Brand X Pictures/Jupiterimages

drugs that may pose risks for babies and enable both parents to participate fully in a natural, empowering experience. The most common model of natural childbirth is the Lamaze method. Along with a coach who attends classes with her, the woman is trained to pant or breathe rapidly in sync with her contractions and to concentrate on other sensations to ease the perception of pain. Other methods use mental imagery, massage, gentle pushing, and deep breathing.

Today improvements in medicated delivery have led many mothers to choose pain relief, sometimes along with natural methods. A woman may be given local (vaginal) anesthesia, also called a pudendal block, usually during the second stage of labor. Or she can receive an analgesic (painkiller), which reduces the perception of pain by depressing the activity of the central nervous system. However, analgesics may slow labor, cause maternal complications, and make the baby less alert after birth.

Another form of pain relief is regional anesthesia, or an epidural, which can be injected into a space in the spinal cord between the vertebrae in the lumbar (lower) region. This blocks the nerve pathways that would otherwise carry the sensation of pain to the brain. Approximately 71 percent of women receive epidurals or other spinal anesthesia during labor (Butwick et al., 2018). Although previous researchers believed epidurals given early in labor could block pain and even shorten labor with no added risk of cesarean (Wong et al., 2005), newer data suggest that the use of high-dosage epidurals may slow the rate of labor, although lower doses do not appear to be as disruptive (Lim et al., 2018).

In many traditional cultures and increasingly in developed countries, childbearing women are attended by a **doula**, an experienced mentor, coach, and helper who can furnish emotional support and information and can stay at a woman's bedside throughout labor. Studies have found that the use of a doula is associated with a decreased likelihood of a low-birth-weight baby, birth complications, and cesarean delivery, and a greater chance of breastfeeding success (Gruber et al., 2013; National Partnership for Women, 2018). Doulas also provide an economic benefit. Infants born before 37 weeks of gestation incur medical costs that average approximately 10 times what the costs are for a full-term infant. Additionally, cesarean deliveries are double the cost of vaginal births. Thus, the use of doulas is a cost-effective strategy and, if funded by insurance, would result in significant overall savings (Kozhimannil et al., 2016).

Unfortunately, doulas are often not covered by insurance, and cost is the largest barrier most women face in securing the support of a doula (Strauss et al., 2015). BIPOC have higher rates of cesarean delivery, preterm birth, neonatal and maternal mortality, and congenital abnormalities than White mothers (Bryant et al., 2010). Given the strong relationship in the United States between race and socioeconomic status, the implication of this is that those expectant mothers who would most benefit from the support of a doula are often the least likely to be able to do so.

## CHILDBIRTH AND THE COVID-19 PANDEMIC

Early research suggested COVID-19 infection did not lead to intrauterine transmission of the virus to fetuses, greater likelihood of birth complications, or death of the fetus or mother (Liu et al., 2020). More recent work suggests this early optimism may have been misplaced, and infected pregnant women may be more likely to experience complications such as a preterm birth, preeclampsia (dangerously high maternal blood pressure), or other adverse pregnancy outcomes (Wei et al., 2020). More research is needed before definitive statements on pregnancy and COVID-19 can be made.

During the pandemic, most hospitals changed their policies surrounding labor and delivery in an attempt to keep uninfected pregnant women and their newborns safe. For example, preliminary health checks and prenatal visits were shifted online when possible to avoid unnecessary social contact in the weeks leading to delivery. Additionally, during delivery, most hospitals limited the number of people permitted to be present during labor, a decision with repercussions for those women who hoped to use

a doula during birth. Many hospitals also kept new mothers and their babies physically separated from other patients. Mothers diagnosed with COVID-19 were advised to room-in with their babies while using safety measures to minimize the risk of transmission (American College of Obstetrics and Gynecology, 2021).

These procedures, while necessary to minimize risk, heightened the toll on delivering women. Women who were infected with COVID-19 during their pregnancies were more than twice as likely to report acute traumatic stress symptoms than uninfected women. Moreover, they were less likely to have visitors in the hospital or to room-in with their babies and more likely to have a low-birth-weight child (Mayopoulos et al., 2021).

## checkpoint can you...

- Describe the three stages of vaginal childbirth?
- Discuss costs and benefits of cesarean births?
- Compare medicated delivery with alternative methods of childbirth?
- Discuss the impact of COVID-19 on childbirth?

# The Newborn Baby

The **neonatal period**, the first 4 weeks of life, is a time of transition from the uterus, where a fetus is supported entirely by the mother, to an independent existence. What are the physical characteristics of newborn babies, and how are they equipped for this crucial transition?

## SIZE AND APPEARANCE

An average **neonate**, or newborn, in the United States is about 20 inches long and weighs about 7½ pounds. Boys tend to be slightly longer and heavier than girls, and a firstborn child is likely to weigh less at birth than laterborns. In their first few days, neonates lose as much as 10 percent of their body weight, primarily because of a loss of fluids. They begin to gain weight again at about the 5th day and are generally back to birth weight by the 10th to the 14th day.

New babies have distinctive features, including a large head (one-fourth the body length) and a receding chin (which makes it easier to nurse). Newborn infants also have areas on their heads known as fontanelles where the bones of the skull do not meet. Fontanelles are covered by a tough membrane that allows for flexibility in shape, which eases the passage of the neonate through the vaginal canal. In the first 18 months of life, the plates of the skull gradually fuse together.

Many newborns have a pinkish cast; their skin is so thin that it barely covers the capillaries through which blood flows. During the first few days, some neonates are very hairy because some of the lanugo, a fuzzy prenatal hair, has not yet fallen off. Almost all new babies are covered with vernix caseosa ("cheesy varnish"), an oily protection against infection that dries within the first few days.

"Witch's milk," a secretion that sometimes leaks from the swollen breasts of newborn boys and girls around the 3rd day of life, was believed during the Middle Ages to have special healing powers. Like the whitish or blood-tinged vaginal discharge of some newborn girls, this fluid emission results from high levels of the hormone estrogen, which is secreted by the placenta just before birth and goes away within a few days or weeks. A newborn, especially if premature, also may have swollen genitals.

## BODY SYSTEMS

Before birth, blood circulation, respiration, nourishment, elimination of waste, and temperature regulation are accomplished through the mother's body. All these systems, with the exception of the lungs, are functioning to some degree by the time a full-term birth occurs, but the mother's own body systems are still involved and the fetus is not yet an independent entity. After birth, all of the baby's systems and functions must operate on their own.

During pregnancy, the fetus and mother have separate circulatory systems and heartbeats. The fetus gets oxygen through the umbilical cord, which carries used blood to the

### neonatal period

First 4 weeks of life, a time of transition from intrauterine dependency to independent existence.

### neonate

Newborn baby, up to 4 weeks old.



How much a baby weighs at birth is positively associated with their scores on intelligence tests taken in young adulthood, middle age, and late adulthood (Flensborg-Madsen & Mortensen, 2017).

**anoxia**

Lack of oxygen, which may cause brain damage.

**neonatal jaundice**

Condition, in many newborn babies, caused by immaturity of liver and evidenced by yellowish appearance; can cause brain damage if not treated promptly.

**checkpoint**  
can you . . .

- Describe the normal size and appearance of a newborn, and list several changes that occur within the first few days?
- Compare five fetal and neonatal body systems?
- Identify two dangerous conditions that can appear soon after birth?

**Apgar scale**

Standard measurement of a newborn's condition; it assesses appearance, pulse, grimace, activity, and respiration.

placenta and returns a fresh supply. Once birth occurs, a newborn must start breathing for itself. Most babies start to breathe as soon as they are exposed to air. If a neonate does not begin breathing within about 5 minutes, the baby may suffer permanent brain injury caused by **anoxia**, lack of oxygen, or hypoxia, a reduced oxygen supply. Anoxia or hypoxia may occur during delivery (though rarely so) as a result of repeated compression of the placenta and umbilical cord with each contraction. This form of birth trauma can leave permanent brain damage, causing intellectual disability, behavior problems, or even death.

Many babies are born alert and ready to begin feeding. Full-term babies have a strong sucking reflex to take in milk, as well as having their own gastrointestinal secretions to digest it. During the first few days, infants secrete meconium, a stringy, greenish-black waste matter formed in the fetal intestinal tract. When the bowels and bladder are full, the sphincter muscles open automatically; a baby will not be able to control these muscles for many months.

The layers of fat that develop during the last 2 months of fetal life help healthy full-term infants to keep their body temperature constant after birth despite changes in air temperature. Newborn babies also maintain body temperature by increasing their activity when air temperature drops.

Three or four days after birth, about half of all babies (and a larger proportion of babies born prematurely) develop **neonatal jaundice**: their skin and eyeballs look yellow. The immaturity of the liver and failure to filter out bilirubin, a by-product resulting from the breakdown of red blood cells, cause this kind of jaundice. Usually it is not serious, does not need treatment, and has no long-term effects. However, severe jaundice that is not monitored and treated promptly may result in brain damage.

## MEDICAL AND BEHAVIORAL ASSESSMENT

The first few minutes, days, and weeks after birth are crucial for development. It is important to know as soon as possible whether a baby has any problem that needs special care.

**The Apgar Scale** One minute after delivery and then again 5 minutes after birth, most babies are assessed using the **Apgar scale** (Table 1). Its name, after its developer, Dr. Virginia Apgar (1953), helps us remember its five subtests: *appearance* (color), *pulse* (heart rate), *grimace* (reflex irritability), *activity* (muscle tone), and *respiration* (breathing). The newborn is rated 0, 1, or 2 on each measure, for a maximum score of 10. A 5-minute score of 7 to 10 indicates that the baby is in good to excellent condition. A score below 5 to 7 means the baby needs help to establish breathing; a score below 4 means the baby needs immediate lifesaving treatment. Scores of 0 to 3 at 10, 15, and 20 minutes after birth are increasingly associated with cerebral palsy (muscular impairment due to brain damage prenatally or during birth) or other neurological problems. Prematurity, low birth weight, trauma, infection, birth defects, medication given to the mother, and other conditions may also affect the scores (American College of Obstetricians and Gynecologists, 2015).

**Brazelton Neonatal Behavioral Assessment Scale (NBAS)**

Neurological and behavioral test to measure neonate's responses to the environment.

**The Brazelton Scale** The **Brazelton Neonatal Behavioral Assessment Scale (NBAS)**; (Brazelton, 1973) is used to assess neonates' responsiveness to their environment, to identify strengths and vulnerabilities in neurological functioning, and to predict future development. The test is suitable for infants up to 2 months old. It assesses (1) motor organization, as shown by such behaviors as activity level and the ability to bring a hand to the mouth; (2) reflexes; (3) changes in state, such as irritability, excitability, and ability to quiet down after being upset; (4) attention and interactive capacities, as shown by general alertness and response to visual and auditory stimuli; and (5) indications of central nervous system instability, such as tremors and changes in skin color. The NBAS takes about 30 minutes to administer, and scores are based on a baby's best performance. The NBAS is most commonly used in research applications, although it is useful as an educational tool for parents and in interventions.

**TABLE 1** Apgar Scale

Sign*	0	1	2
<b>Appearance (color)</b>	Blue, pale	Body pink, extremities blue	Entirely pink
<b>Pulse (heart rate)</b>	Absent	Slow (below 100)	Rapid (over 100)
<b>Grimace (reflex irritability)</b>	No response	Grimace	Coughing, sneezing, crying
<b>Activity (muscle tone)</b>	Limp	Weak, inactive	Strong, active
<b>Respiration (breathing)</b>	Absent	Irregular, slow	Good, crying

\*Each sign is rated in terms of absence or presence from 0 to 2; highest overall score is 10.

Source: Adapted from Apgar (1953).



The Apgar scale is popular because it's easy to remember and requires no fancy medical equipment, making it useful to quickly assess the health of a newborn.

**Neonatal Screening for Medical Conditions** Children who inherit the enzyme disorder phenylketonuria (PKU) will develop permanent intellectual disability unless they are fed a special diet beginning in the first 3 to 6 weeks of life (National Institute of Child Health and Human Development, 2017). Screening tests administered soon after birth often can discover this and other defects.

Routine screening of all newborn babies for such rare conditions as PKU (1 case in 15,000 births), congenital hypothyroidism (1 in 3,600 to 5,000), galactosemia (1 in 60,000 to 80,000), and other, even rarer, disorders is expensive. Yet the cost of testing thousands of newborns to detect one case of a rare disease may be less than the cost of caring for one person with significant disability for a lifetime. The Recommended Uniform Screening Panel, developed by the US government in conjunction with professionals in the field, includes 35 core conditions and 26 secondary conditions for which it recommends screening all newborns. However, states vary with respect to which conditions they include (US Department of Health and Human Services, 2020).

## STATES OF AROUSAL

Are you an early bird or a night owl? Do you work most effectively in the morning or in the afternoon? We all have internal biological clocks that regulate our **states of arousal** and activity over the course of a day. Babies also have an internal clock that regulates their daily cycles of eating, sleeping, elimination, and even their moods. These periodic cycles of wakefulness, sleep, and activity, which govern an infant's state of arousal, or degree of alertness (Table 2), seem to be inborn and highly individual. Changes in state are coordinated by multiple areas of the brain (Tokariev et al., 2016) and are accompanied by changes in the functioning of virtually all body systems (Scher et al., 2004).

The establishment of "stable and distinct" states of arousal is associated with newborn health and positive outcomes because they are a marker of neurological organization. For example, infants who showed more organized sleep patterns early in life had better motor and cognitive performance at 18 to 24 months of age (Shellhaas et al., 2017).

Youngest babies sleep the most and wake up the most frequently. Parents report that from 0 to 2 months of age, infants sleep about 14.5 hours a day and wake 1.7 times per night. However, by 1 year of age, those numbers have dropped to 12.6 hours of sleep and waking 0.7 times per night. Likewise, their longest sleep period rises from 5.7 hours at 2 months of age to 8.3 hours at 6 to 24 months of age. With respect to daytime napping, a similar developmental trend emerges. At 0 to 5 months, the typical child will nap about 3 hours every day. By 1 to 2 years of age, most children are napping only about an hour (Galland et al., 2012).

## checkpoint can you ...

- Discuss the uses of the Apgar scale and the Brazelton scale?
- Weigh arguments for and against routine screening for rare disorders?

### state of arousal

An infant's physiological and behavioral status at a given moment in the periodic daily cycle of wakefulness, sleep, and activity.

**TABLE 2** States of Arousal in Infancy

State	Eyes	Breathing	Movements	Responsiveness
Regular sleep	Closed; no eye movement	Regular and slow	None, except for sudden, generalized startles	Cannot be aroused by mild stimuli
Irregular sleep	Closed; occasional rapid eye movements	Irregular	Muscles twitch, but no major movements	Sounds or light brings smiles or grimaces in sleep.
Drowsiness	Open or closed	Irregular	Somewhat active	May smile, startle, suck, or have erections in response to stimuli.
Alert inactivity	Open	Even	Quiet; may move head, limbs, and trunk while looking around	An interesting environment (with people or things to watch) may initiate or maintain this state.
Waking activity	Open	Irregular	Much activity	External stimuli bring about more activity, perhaps starting with gentle movements and building up to crying, kicking, and thrashing.

Source: Adapted from information in Prechtl & Beintema (1964).

Swaddling is the ancient practice of wrapping babies tightly in blankets to restrict their movement and help them sleep. It even makes an appearance in the Christian Bible when Mary "brought forth her firstborn son, and wrapped him in swaddling clothes and laid him in a manger."



Newborn's sleep alternates between quiet (regular) and active (irregular) sleep. Active sleep is the equivalent of rapid eye movement (REM) sleep, which in adults is associated with dreaming. Active sleep appears rhythmically in cycles of about 1 hour and accounts for up to 50 percent of a newborn's total sleep time. The amount of REM sleep declines to less than 30 percent of daily sleep time by age 3 and continues to decrease steadily throughout life (Hoban, 2004).

Babies' sleep arrangements and schedules vary across cultures. Among the Micronesian Truk and the Canadian Hare peoples, babies and children have no regular sleep schedules; they fall asleep whenever they feel tired. Mothers in rural Kenya allow their babies to nurse as they please, and their 4-month-olds continue to sleep only 4 hours at a stretch (Broude, 1995). Similarly, !Kung mothers in the Kalahari co-sleep with their infants, who wake frequently to nurse throughout the night (Konner, 2017). When there is a bedtime, it may differ widely by country (Window on the World). The average bedtime in Australia and New Zealand is 7:43 pm, whereas in India, the average bedtime is 10:26 pm. In many predominantly Asian countries, bedtimes are later and total sleep time is shorter than in predominantly Caucasian countries, but children continue to nap later into childhood (Mindell et al., 2013). Even within the United States, there are variations across different groups. Racial and ethnic minorities, as well as people from lower socioeconomic levels, report more sleep problems and shorter sleep times in their infants (Grandner et al., 2016).

In the United States, many parents spend a great deal of energy trying, often unsuccessfully, to soothe fussy infants to sleep. This is common; across different cultures, parents are likely to report sleeping problems. In predominantly Caucasian countries, most parents—about 57 percent—put their children to sleep in their own crib or bed. In predominantly Asian countries, only 4 percent of parents do so (Mindell et al., 2010). Despite these different sleep patterns, over the course of a 24-hour day, young children across different cultures get roughly equivalent amounts of sleep, often making up lost nighttime sleep with daytime naps (Mindell et al., 2013). Still, sleep problems are an important issue to address; low-quality or insufficient infant sleep has been associated with later attention and behavioral problems (Sadeh et al., 2015).

### checkpoint can you...

- Explain how states of arousal reflect neurological status and discuss variations in newborns' states?
- Tell how sleep patterns change and how cultural practices can affect these patterns?

## WHERE TO LAY YOU DOWN TO SLEEP? SLEEP CUSTOMS ACROSS THE WORLD

In many cultures, co-sleeping with young infants is expected. For example, in hunter-gatherer cultures such as the Hadza of Tanzania, the !Kung of the Kalahari desert, the Efe and Aka of the Congo, the Ache of Paraguay, and the Agta of the Philippines, it is standard for infants to sleep with an adult, most commonly the mother (Konner, 2017). In one review of 90 nonindustrial cultures, infants slept with their mother in the same bed and/or the same room in all cultures; in no culture was the child put in a separate room to sleep (Barry & Paxson, 1971). Mayan mothers sleep with children until the birth of a new baby and express shock at the idea that anyone would let a baby sleep in a room all alone (Morelli et al., 1992).

Co-sleeping is not only found in nonindustrialized cultures. In countries such as Italy, Bali, Vietnam, Japan, and Thailand, young children are more likely to sleep in the same bed or room as a parent. Overall, co-sleeping is more common in predominantly Asian countries and less so in predominantly Western countries, such as the United States, Canada, Australia, New Zealand, and the United Kingdom (Mindell et al., 2010).

In the United States, co-sleeping has become more popular in recent years. In 1993, approximately 6.5 percent of children usually shared a bed with their mother. By 2015, the percentage rose to almost 25 percent. Bed-sharing mothers were less likely to have a college degree. They also tended to be younger, to be BIPOC rather than white, to live in the western or southern United States, and to breastfeed (Colson et al., 2013; Bombard et al., 2018).

Although the American Academy of Pediatrics (2016) advises against co-sleeping with infants aged

4 months and younger, some researchers argue co-sleeping is a safe and desirable choice. The physical closeness of mother and baby facilitates breastfeeding, touching, and maternal responsiveness. Moreover, both baby and mother sleep better when sharing a bed. Co-sleeping, they say, is safe as long as commonsense risk reduction strategies are used (Mariñelli et al., 2019).

In Western cultures, with their emphasis on independence, learning to sleep alone is often viewed as a crucial step toward self-sufficiency. However, this does not mean co-sleeping, likely to have been the predominant pattern for most of human history and in most cultures, is wrong. Rather, it stems from a different parenting philosophy that views the integration of the child into the social group to be more important than the early development of autonomy. It is important we consider our biases when viewing child care practices from other cultures before dismissing them as flawed. Moreover, rather than trying to eliminate potentially supportive developmental practices, public health messages for parents would benefit from a more culturally sensitive approach and a focus on how to safely co-sleep for those families choosing it (Barry, 2019).



What are the cultural messages being transmitted to infants when they are asked to sleep in their own beds versus co-sleeping? Can you think of other childcare practices that transmit cultural messages to children?

## Complications of Childbirth

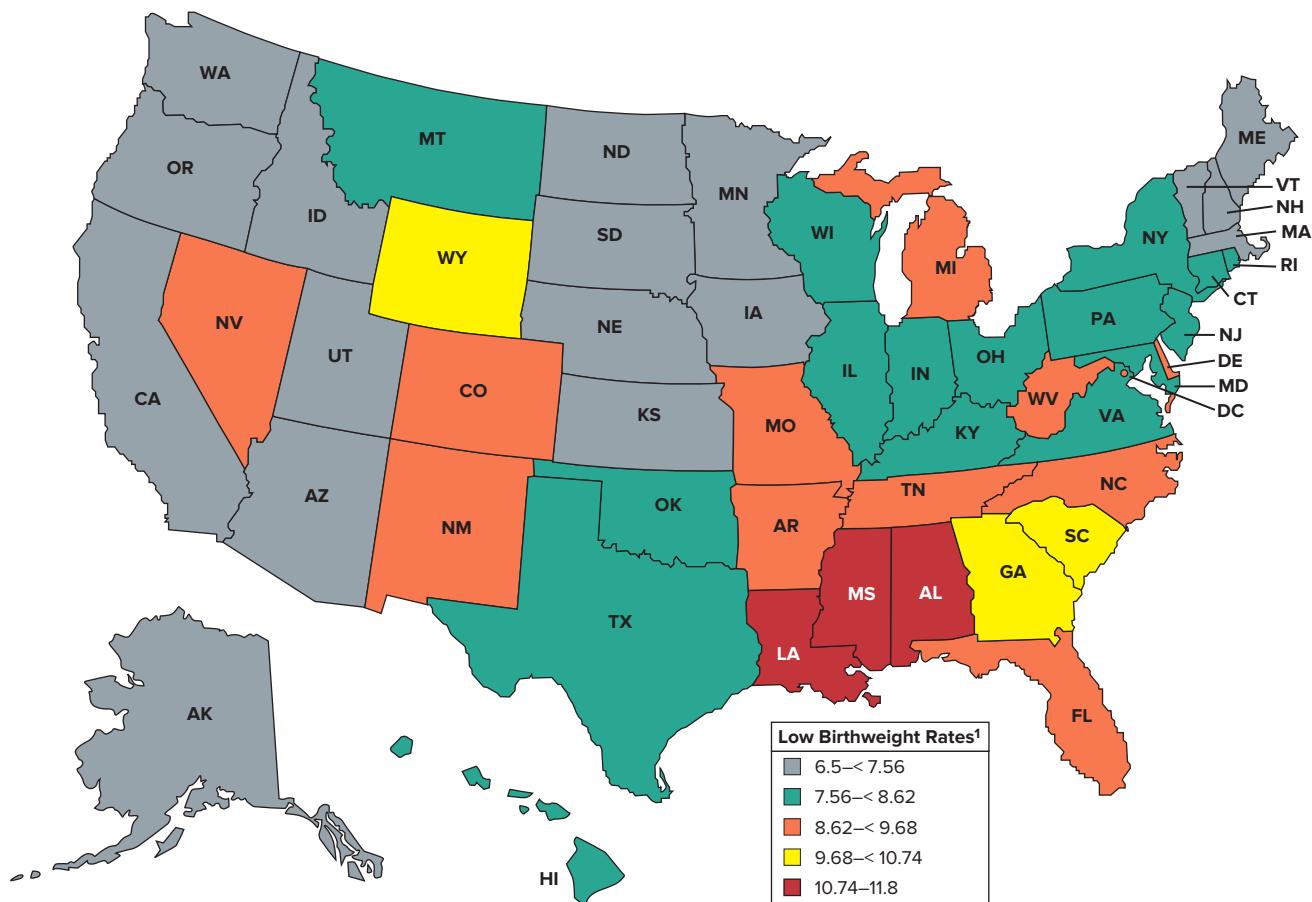
Although the great majority of births result in normal, healthy babies, some, sadly, do not. Some are born prematurely or very small, some remain in the womb too long, and some are born dead or die soon after birth.

### LOW BIRTH WEIGHT

**Low-birth-weight babies (LBW)** are those neonates born weighing less than 2,500 grams (5 pounds) at birth. There are two types of LBW babies: those born early and those

#### **low-birth-weight babies (LBW)**

Weight of less than 5½ pounds (2500 grams) at birth because of prematurity or being small-for-date.



**FIGURE 4**

## Percentage of Low-Birth-Weight Babies by State, 2020

Source: Centers for Disease Control and Prevention (2022).

### preterm (premature) infants

Infants born before completing the 37th week of gestation.

### small-for-date (small-for-gestational-age) infants

Infants whose birth weight is less than that of 90 percent of babies of the same gestational age, as a result of slow fetal growth.

born small. Babies born before the 37th week of gestation are known as **preterm (premature) infants**. Being born early is closely associated, as might be expected, with being smaller than a full-term infant (Figure 4). Some babies, known as **small-for-date (small-for-gestational-age) infants**, are born at or around their due dates but are smaller than would be expected. These babies weigh less than 90 percent of babies of the same gestational age. They are small, not because they were born early and did not have a chance to finish putting on weight, but for other reasons, most commonly inadequate prenatal nutrition, which slows fetal growth.

An estimated 14.6 percent of all infants worldwide are born with LBW. The percentages are far higher in less economically developed countries, especially southern Asia and sub-Saharan Africa. The true extent of LBW may be much higher because nearly half of the newborns in the developing world are not weighed at birth (Blencowe et al., 2019). In 2020, the US percentage of LBW infants was 8.24 percent, the highest rate reported since 2006 (Osterman et al., 2022).

Low birth weight in developing regions stems primarily from the mother's poor health and nutrition and difficulty securing prenatal care. In wealthier countries, much of the incidence of low birth weight and preterm births is due to delayed childbearing, multiple births, and use of fertility drugs and induced and cesarean deliveries (World Health Organization, 2019). The risk of both preterm delivery and low birth weight increases rapidly with the number of babies being carried, approaching 100 percent for

quadruplets (Martin et al., 2017). In the United States, LBW is also correlated with demographic and socioeconomic factors such as being a young or older mother, a BIPOC, or being born in certain regions such as the southern and plains states (Osterman et al., 2022). Additionally, a birth interval of 36 or fewer months is associated with infant mortality, particularly in developing countries (Molitoris et al., 2019).

The high proportion of preterm newborns—14.36 percent (Osterman et al., 2022)—is a major factor in the high mortality rates of Black babies. Reasons for the greater prevalence of LBW, preterm births, and infant mortality among African American babies include (1) health behaviors and socioeconomic status; (2) higher levels of stress in African American women; (3) greater susceptibility to stress; (4) the impact of racism, which may contribute to or exacerbate stress; and (5) ethnic differences in stress-related body processes, such as blood pressure and immune reactions (Giscombe & Lobel, 2005).

Birth weight and length of gestation are the two most important predictors of an infant's survival and health (Mathews & MacDorman, 2008). Together, they constitute the second-leading cause of death in infancy in the United States after birth defects (Ely & Driscoll, 2020). Preterm birth is involved in nearly half of neurological birth defects, such as cerebral palsy, and more than one-third of infant deaths. Altogether, low-birth-weight infants account for more than two-thirds of infant deaths. Internationally, low birth weight is an underlying factor in 60 to 80 percent of neonatal deaths worldwide (UNICEF, 2008). Girls tend to be hardier than boys (Glass et al., 2015).

The United States has been more successful than any other country in saving low-birth-weight babies, but the rate of such births to US women remains higher than in many European and Asian nations (MacDorman & Mathews, 2009). Preventing preterm births would greatly increase the number of babies who survive the first year of life. In the last decade, some countries have halved deaths attributed to preterm delivery, most notably with training and the provision of equipment and supplies. For example, even low-tech changes such as ensuring appropriate warmth, support for breastfeeding, and training in basic care for infections and breathing problems can reduce mortality rates.

**Immediate Treatment and Outcomes** The most pressing fear regarding very small babies is that they will die in infancy given the multitude of challenges they face. Because their immune systems are not fully developed and because they must often be subjected to multiple invasive medical procedures, they are especially vulnerable to infection, which has been linked to slowed growth and developmental delays (Scharf et al., 2016). Moreover, their nervous systems may be too immature for them to perform functions basic to survival, such as sucking, often making it necessary for them to be fed intravenously. Additionally, as they do not have enough fat to insulate them and to generate heat, it is difficult for them to stay warm. These early experiences are stressful, which further erode their early coping capacities.

One particularly difficult condition commonly faced by preterm babies is respiratory distress syndrome. Babies born early lack an adequate amount of an essential lung-coating substance called surfactant, which keeps air sacs from collapsing. These babies may breathe irregularly or stop breathing altogether. Administering surfactant to high-risk preterm newborns has dramatically



A girl under age 17 who smokes while pregnant has two risk factors for bearing a low-birth-weight baby.  
PhotoAlto/Sigrid Olsson/Getty Images



The antiseptic, temperature-controlled crib, or isolette, in which this premature baby lies has holes through which the infant can be examined, touched, and massaged. Frequent human contact helps low-birth-weight infants thrive.  
Kristina Bessolova/Shutterstock

increased survival rates since the late 1990s (Glass et al., 2015). Moreover, new, less invasive techniques have been developed that appear as effective as prior methods but do not require intubation of the infant (Lau et al., 2017; Márquez et al., 2019).

A low-birth-weight or at-risk preterm baby may be placed in an isolette, an antiseptic, temperature-controlled crib. To counteract the sensory impoverishment of life in an isolette, hospital workers and parents are encouraged to give these small babies special handling. Gentle massage seems to foster growth and weight gain, and is also associated with improvements in developmental scores, reduced stress, improved immune system functioning, decreased pain responses, and earlier release from the hospital (Pados & McGlothen-Bell, 2019; Niemi, 2017).

#### kangaroo care

Method of skin-to-skin contact in which a newborn is laid face down between the mother's breasts for an hour or so at a time after birth.

**Kangaroo care (KC)**, an intervention involving extended skin-to-skin contact, has been theorized to help preemies—and full-term infants—make the adjustment from fetal life to the jumble of sensory stimuli in the outside world. This soothing contact seems to reduce stress on the central nervous system and help with self-regulation of sleep and activity. A recent meta-analysis demonstrated that the use of KC was associated with a 36 percent decrease in mortality risk when compared with conventional care. Moreover, KC was associated with a greater likelihood of exclusive breast-feeding up to 4 months of age; decreased risk of neonatal sepsis (a life-threatening response to infection), hypothermia (low body temperature), and hypoglycemia (low blood sugar); lower likelihood of hospital readmission; improved vital signs; greater head circumference growth; and lower pain scores. These findings are particularly applicable for developing countries where technologies such as incubators and isolettes may not be available, as KC is both low-cost and highly effective (Boundy et al., 2016).

**Long-Term Outcomes** Even if low-birth-weight babies survive the dangerous early days, their trials may not be over. In longitudinal studies of extremely low-birth-weight infants (about 1 to 2 pounds at birth) and infants born before 26 weeks of gestation, the survivors tend to be smaller than full-term children and are more likely to have neurological, sensory, cognitive, educational, and behavioral problems (Hutchinson et al., 2013; Johnson & Marlow, 2017). Cognitive deficits, especially in memory and information-processing speed, have been noted among very low-birth-weight babies (those weighing less than 1,500 grams or 3.5 pounds at birth) by age 5 or 6 months, continuing throughout childhood (Rose et al., 2002), adolescence (Litt et al., 2012), and persisting into adulthood (Johnson & Marlow, 2017). Very-low-birth-weight children and adolescents also tend to have more behavioral and mental health problems than those born at normal weight (Johnson & Marlow, 2014), as well as impaired motor development in young adulthood (Husby et al., 2016).

While most survivors of prematurity, even when born very young and small, live productive and happy lives, they are at greater risk for a host of adverse health outcomes when compared to adults who were born full term. For example, as adults, preterm babies are at increased risk of high blood pressure, metabolic syndrome and obesity, and accelerated aging processes (Prior & Modi, 2020). Additionally, they are also at higher risk for both child and adult onset diabetes (Crump et al., 2020) and asthma (Arroyas et al., 2020). Generally, the shorter the period of gestation, the greater the likelihood of conditions such as cerebral palsy and intellectual disability and outcomes such as low educational and job-related income levels (Johnson & Marlow, 2017).

However, environmental factors can make a difference. Factors such as maternal education, two-parent family structure, and higher SES are associated with positive developmental outcomes for preterm infants (Voss et al., 2012; Poehlmann-Tynan et al., 2015). Parenting matters as well. When parents are low in anger and criticism or when mothers are high in sensitivity or low in anxiety, preterm babies have better outcomes (Poehlmann-Tynan et al., 2015; Faure et al., 2017; Zelkowitz et al., 2011). Babies are highly resilient, and a high-quality postnatal environment can do much to moderate the potential effects of being born small.



Thanks to their own resilience, many children who live in less than ideal circumstances, such as this child in war-torn Afghanistan, can develop into self-confident, successful adults.

Staff Sgt. Marcus McDonald/U.S. Air Force

## POSTMATURITY

When people think about birth complications, they generally think about issues related to being born too early or too small. However, babies can also be negatively affected by staying too long in the womb. In fact, approximately 4.88 percent of pregnant women in the United States do not give birth spontaneously after 42 or more weeks of gestation (Osterman et al., 2022). Because data show that inducing pregnancy at this point does not increase the risk of cesarean section and is associated with better outcomes (Bleicher et al., 2017), most doctors will opt to induce labor at this point. If they do not, the baby will be considered **postmature**.

Postmature babies tend to be long and thin because they have kept growing in the womb but have had an insufficient blood supply toward the end of gestation. Possibly because the placenta has aged and become less efficient, it may provide less oxygen. The baby's greater size also complicates labor; the mother has to deliver a baby the size of a normal 1-month-old. This puts the mother at higher risk of a cesarean delivery, perineal tears, and postpartum hemorrhage, and the neonate at greater risk of shoulder dystocia (a condition in which the baby's shoulders become stuck behind the mother's pelvic bone during delivery), meconium aspiration, low Apgar scores, brain damage, and death (American College of Obstetricians and Gynecologists, 2014).

### postmature

A fetus not yet born as of 2 weeks after the due date or 42 weeks after the mother's last menstrual period.

## STILLBIRTH

**Stillbirth**, the sudden death of a fetus at or after the 20th week of gestation, is a tragic union of opposites—birth and death. Sometimes fetal death is diagnosed prenatally; in other cases, the baby's death is discovered during labor or delivery.

Worldwide, about 1.9 million fetuses were stillborn in 2019. Most stillbirths occur in sub-Saharan Africa or Southern Asia, with the highest rates found in India, Pakistan, Nigeria, the Democratic Republic of the Congo, China, and Ethiopia. Tragically, most stillbirths are preventable with high-quality interventions and health care (Hug et al., 2020).

Despite a trend of gradually decreasing incidence from 1982 to 2017, the number of stillbirths is higher in the United States than in most other industrialized countries (Dongawar et al., 2020). Every year, there are approximately 24,000 stillbirths, with the highest rates found in the oldest mothers. Rates are highest for women aged 40 and older. Additionally, rates vary by ethnicity, with more than double the risk found in non-Hispanic Black women (10.66 percent) than in non-Hispanic White women (4.98 percent) (Gregory et al., 2018). Boys, twins, and higher multiples are more likely to be stillborn than singletons (MacDorman & Gregory, 2015).

Although the cause of stillbirth is often not clear, many stillborn fetuses are small for gestational age, indicating malnourishment in the womb (MacDorman & Gregory, 2015). Fetuses believed to have problems can have prenatal surgery in the womb to correct congenital problems or be delivered prematurely. Interventions such as these could prevent a large proportion of stillbirths (Bhutta et al., 2011).

### stillbirth

Death of a fetus at or after the 20th week of gestation.

### checkpoint

can you...

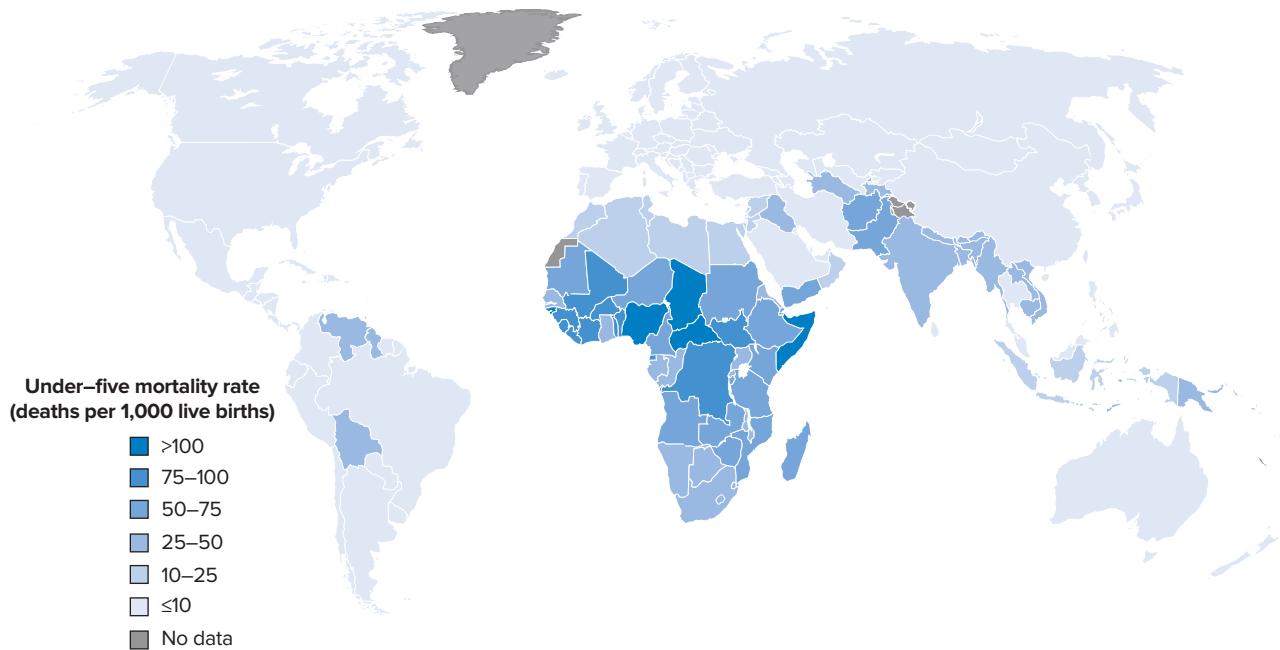
- Discuss the risk factors, treatment, and outcomes for low-birth-weight babies?
- Explain the risks attending postmaturity?
- Discuss trends and risk factors for stillbirth?

# Survival and Health

Infancy and toddlerhood are risky times of life. How many babies die during the first year, and why? What can be done to prevent dangerous or debilitating childhood diseases? How can we ensure that infants and toddlers live, grow, and develop as they should?

## INFANT MORTALITY

Great strides have been made in protecting the lives of new babies, but these advances are not evenly distributed, and the impact of the COVID-19 pandemic threatens those



**FIGURE 5**

## Under-5 Mortality Rate, 2020

*Most neonatal deaths occur in sub-Saharan Africa and Asia.*

Source: UNICEF (2021).

### infant mortality rate

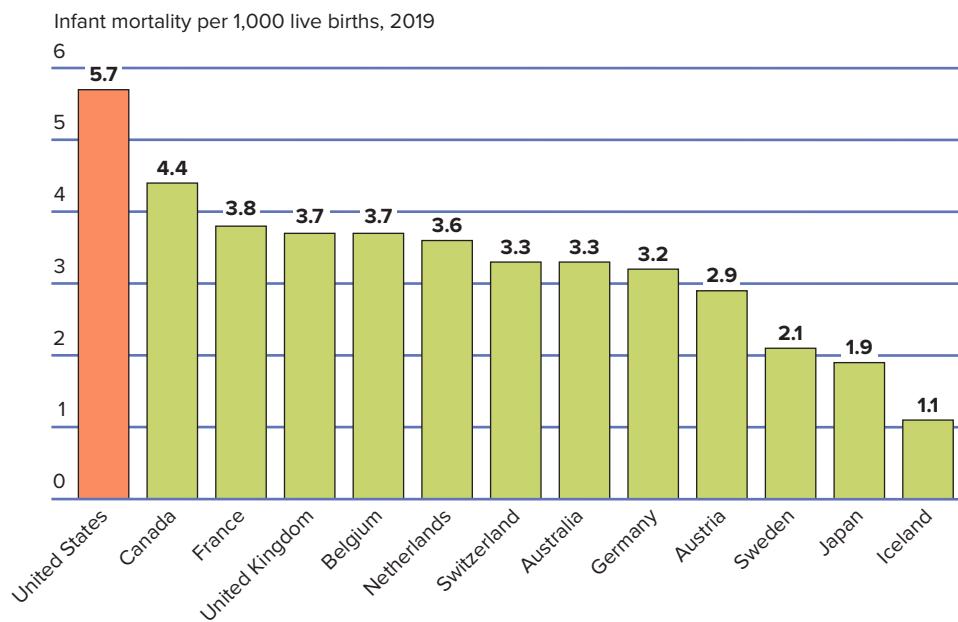
Proportion of babies born alive who die within the 1st year.

gains. In 2020, 5 million children 5 years of age and younger died. Of those deaths, 2.4 million were infants 28 days or younger in age. The vast majority of these early deaths are in developing countries (Figure 5), especially in South Asia and West and Central Africa (UNICEF, 2021).

The bulk of neonatal deaths—75 percent—occur in the first week of life. The chief causes of neonatal death worldwide are preterm birth complications (35 percent), child-birth complications (24 percent), and sepsis (15 percent). Many of these deaths are preventable, resulting from a combination of poverty, poor maternal health and nutrition, infection, and inadequate medical care (UNICEF, 2015, 2021). Although maternal mortality declined 38 percent from 2000 to 2017, the number of women and girls who die in childbirth is still about 303,000 a year. Most of these deaths (27 percent) are due to hemorrhage, with preexisting medical conditions, eclampsia, embolisms, and complications of unsafe abortions also playing a role (UNICEF, 2017). About two-thirds of maternal deaths occur during the immediate postnatal period, and infants whose mothers have died are more likely to die than infants whose mothers remain alive (Sines et al., 2007). As with neonatal deaths, many of these deaths are preventable.

In the United States, the **infant mortality rate**—the proportion of babies who die within the 1st year—has fallen almost continuously since the beginning of the twentieth century, when 100 infants died for every 1,000 born alive. In 2019, the infant mortality rate was 5.6 per 1,000 live births. Birth defects and genetic abnormalities are the leading cause of infant deaths in the United States, followed by disorders related to prematurity or low birth weight, injuries, sudden infant death syndrome (SIDS), and maternal complications of pregnancy (Centers for Disease Control and Prevention, 2021). Infant mortality is higher in southern states and some areas of the Midwest and in young mothers (Kamal et al., 2019) and, as we discuss shortly, in BIPOC.

The overall improvement in US infant mortality rates since 1990 is attributable largely to prevention of SIDS as well as to effective treatment for respiratory distress and medical advances in keeping very small babies alive. Still, mainly because of the prevalence of preterm births and low birth weight, US babies have less chance of reaching their 1st birthday than do babies in many other developed countries.. The US infant mortality rate in 2018 (Figure 6) ranked number 33 out of 37 similar OECD countries despite the highest health care spending of all OECD countries (United Health Foundation, 2021).



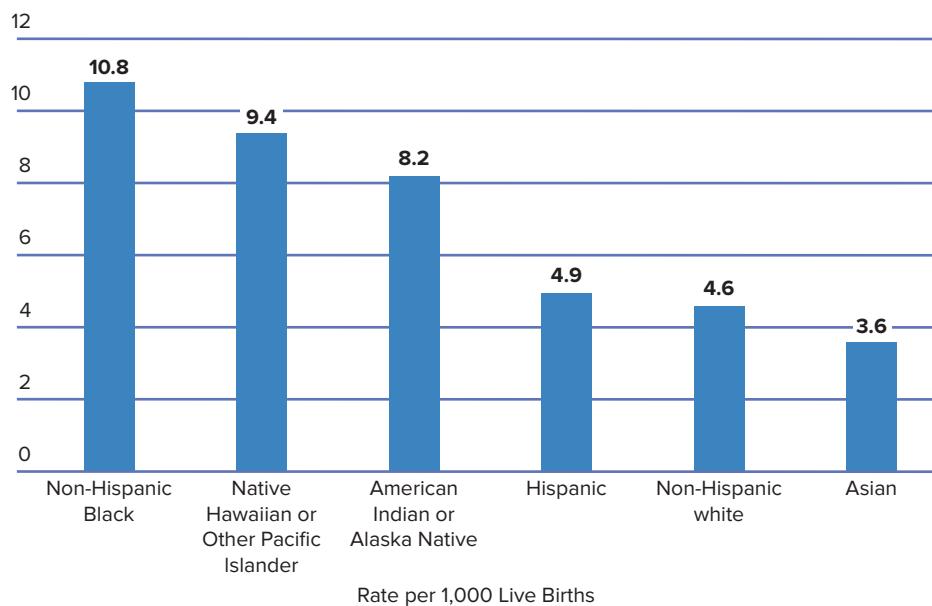
**FIGURE 6**  
Infant Mortality Rates in Comparable Countries

Despite dramatic improvements, the United States has a higher infant mortality rate than that of comparable nations.

Source: United Health Foundation (2021).

**Racial/Ethnic Disparities in Infant Mortality** Infant mortality in the United States has declined; however, this decline is uneven, and large disparities remain between racial and ethnic groups (Figure 7). The infant mortality rate of Black babies and American Indian/Alaskan Native babies is far higher than that of Hispanic, non-Hispanic White, and Asian babies (Ely & Driscoll, 2021). For example, African American babies had 122 percent chance higher of infant mortality than did White babies in 2017 (Singh & Stella, 2019).

The largest single factor driving the disparity in death rates is the rate of preterm and low-birth-weight babies born to BIPOC. A number of influences help account for the differential risk of outcomes. These include individual-level factors such as socioeco-



**FIGURE 7**  
Infant Mortality Rates by Race/Ethnicity, United States 2018

*Ethnicity influences mortality, and African American babies have the highest death rates.*

Source: Centers for Disease Control and Prevention (2020).

nomic status, marital status, health care access, food or housing insecurity, and the experience of racism and discrimination. Other factors exist at a community-wide level, including poverty, crime, exposure to air pollution or other toxins, and community segregation (Lorch & Enlow, 2016).

Because causes and risk factors vary among ethnic groups, efforts to further reduce infant deaths need to focus on factors specific to each ethnic group (Lorch & Enlow, 2016). For example, preexisting conditions such as obesity, cardiovascular disease, and high blood pressure can increase the risk associated with pregnancy, and the prevalence of these conditions varies across groups (Fryar et al., 2020; Peterson et al., 2019). Thus, some of the disparities in infant mortality rates may be attributable to factors such as these (Creanga et al., 2017). Additionally, racial or ethnic disparities in access to and quality of health care for minority children may help account for differences in infant mortality, and behavioral factors such as smoking, and alcohol consumption also play a part. However, even when these factors are controlled for, disparities remain. Researchers are increasingly identifying the chronic stress that structural racism exerts on minority women as an influence on the health of a pregnancy and, hence, the newborn baby (Liu & Glynn, 2021).

#### sudden infant death syndrome (SIDS)

Sudden and unexplained death of an apparently healthy infant.

**Sudden Infant Death Syndrome (SIDS)** Sudden infant death syndrome (SIDS), sometimes called crib death, is the sudden death of an infant under age 1 in which the cause of death remains unexplained after a thorough investigation that includes an autopsy. SIDS accounts for 6 percent of infant mortality rates (Ely & Driscoll, 2020). It peaks between 2 and 4 months and is most common among African Americans, low-birth-weight babies, preterm babies, twins or triplets, and babies whose mothers are young, have previously had three or more children, have high blood pressure during pregnancy, or receive late or no prenatal care (Hakeem et al., 2015). Exposure to smoke, either during pregnancy or after birth, is a key risk factor (Zhang & Wang, 2013).

The search for what causes SIDS has been framed by the “triple risk” model. Within this framework, SIDS is the result of three overlapping factors. First, there is an infant who is vulnerable in some way. Second, there is a critical period during which an infant is at risk. Third, there is an exogenous stressor. SIDS will occur only if a vulnerable infant is exposed to a stressor during the critical period: All three factors must co-occur (Filiano & Kinney, 1994). Thus, a great deal of research has been devoted to investigating what factors might make infants vulnerable and the environmental triggers that can result in that vulnerability being expressed.

In some cases, an underlying biological defect may make some infants vulnerable. For approximately 14 percent of SIDS cases, there appear to be genetic mutations affecting the heart that in triggering circumstances can lead to death (Baruteau et al., 2017). More commonly, some infants appear to be born with delays or defects in the brain stem, which regulates breathing, heartbeat, body temperature, and arousal (Machaalani & Waters, 2014). These defects may prevent SIDS babies who are sleeping face down or on their sides from waking or turning their heads when they breathe stale air containing carbon dioxide trapped under their blankets (Panigrahy et al., 2000). Similarly, babies who have low levels of serotonin may not awaken under conditions of oxygen deprivation and carbon dioxide buildup and are thus at greater risk as well (Duncan et al., 2010).

Thus, the environmental trigger for these vulnerable babies is sleeping on their stomachs during the critical first year of age, and research strongly supports a relationship between this and SIDS. SIDS rates declined in the United States by more than 50 percent in the 10 years following the “Back-to-Sleep” campaign advocating that healthy babies be laid down to sleep on their backs (Trachtenberg et al., 2012).

The American Academy of Pediatrics Task Force (2016) also recommends that infants not sleep on soft surfaces, such as pillows, quilts, or sheepskin, or under loose covers, which, especially when the infant is face down, may increase the risk of overheating or rebreathing (breathing the infant’s own exhaled carbon dioxide). Current recommendations for risk reduction also include sleeping in the parent’s room, but on a separate surface; using breathing monitors and a pacifier; and avoiding tobacco smoke. Breastfeed-

The Back-to-Sleep campaign is a great example of a successful public health campaign. However, it comes with unexpected consequences. Because babies spend less time trying to push up on their arms to see the world, several motor milestones (such as rolling over) are now delayed relative to where they used to be (Davis et al., 1998).



## SHOULD I STAY OR SHOULD I GO: DISPARITIES IN THE USE OF PARENTAL LEAVE

Emily is a new mother to a 12-week-old baby. She has run out of time to stay home and has a difficult decision to make. Will she quit her job or put her new baby in child care?

This is the situation of many parents in the United States. The United States is the only country in the world without any form of federally mandated parental leave. Moreover, the United States joins Suriname and Papua New Guinea as one of only three countries lacking mandated paid maternity leave (Jou et al., 2018). This is unfortunate, as paid leave has numerous benefits for the mother (Beuchert et al., 2016).

Among the benefits to parental leave are lower rates of in neonatal and child mortality and a reduction in maternal stress (Staehelin et al., 2007; Hideg et al., 2018). Moreover, the attachment between a parent and child is developed over the first year of life, especially during the first few months. Ideally, a parent would spend these early months on leave, at home. If attachments are not solidified, there can be negative effects on a child's empathy, emotional regulation, and even future academic success (Plotka & Busch-Rosnagel, 2018).

Currently, the only federal policy on parental leave is the Family and Medical Leave Act of 1993 (FMLA). This act does not provide parental leave for all employees but does provide up to 12 weeks of unpaid leave for those who meet its strict criteria. However, half of the US workforce is not covered by the act, and women are even less likely to be covered than men. In fact, only about 20 percent of new mothers qualify (Plotka & Busch-Rosnagel, 2018; Necker-mann, 2017).

Because FMLA leave is unpaid, socioeconomic status affects new parents' ability to use the time off.

Many of those who qualify may not be able to use the leave because they need the income. This means that many parents, who need this time not only to heal from birth but also to bond with their child, are taking less time off than the already small amount of time available. This is especially true for low-income households and single parents (Jou et al., 2018; Plotka & Busch-Rosnagel, 2018).

In addition to SES differences, there are demographic differences between parents who do and do not take FMLA. For instance, if eligible, women are much more likely to take leave than men, and they are more likely to take longer leaves as well. This can have repercussions for career advancement. There are also racial and ethnic differences. White men are less likely to take FMLA leave than women of any race and men of other ethnicities (Armenia & Gerstel, 2006). Women of color are the least likely to have their leave needs met and are the most likely to have financial problems when taking leave (Vohra-Gupta et al., 2020).

Parental leave can be vitally important for the health of both the parent and child. It is unfortunate that socioeconomic challenges affect who can benefit most from leave policies and that BIPOC individuals are less able to enjoy these benefits.



Why do you think the United States does not have a federal-level parental leave policy? Do you think US parents should get parental leave, and if so, should it be paid or unpaid?

ing and immunizations appear to offer some protection as well. Parents are also counseled to avoid drug and alcohol use when co-sleeping (Moon & Hauck, 2016).

**Accidental Deaths** Although accidental deaths have declined 11 percent in the past decade (Centers for Disease Control and Prevention, 2021), unintentional injuries are still the fifth leading cause of death in infancy in the United States (Ely & Driscoll, 2020). Boys of all ages are more likely to be injured and to die from their injuries than girls, and children from rural areas are at higher risk than those from urban areas. Moreover, as with infant mortality rates and SIDS, risk is higher for children from certain racial or ethnic groups, most notably American Indian, Alaska Native, and African American children (Centers for Disease Control and Prevention, 2021). For example,

- Summarize trends in infant mortality and injury deaths, and give reasons for racial/ethnic disparities?
- Discuss risk factors for, causes of, and prevention of sudden infant death syndrome?

African American, American Indian, and Alaskan Native infants are 2 to 3 times more likely than White infants and 4 to 6 times more likely than Asian, Pacific Islander, and Hispanic infants to die of accidental injuries (Hauck et al., 2011).

About 90 percent of all injury deaths in infancy are due to one of five causes: suffocation, motor vehicle traffic accidents, drowning, residential burns or fires, and falls. Suffocation deaths are most common in children under the age of a year. Among children aged 1 to 4, drowning is the leading cause of unintentional injury deaths, followed by car accidents and exposure to fire or smoke (Murphy et al., 2021; Centers for Disease Control and Prevention, 2021). These statistics speak to the important of baby-proofing the environment as many of these deaths are avoidable.

## IMMUNIZATION FOR BETTER HEALTH

Such once-familiar and sometimes fatal childhood illnesses as measles, pertussis (whooping cough), and polio are now largely preventable, thanks to the development of vaccines that mobilize the body's natural defenses. Unfortunately, many children still are not adequately protected, and nearly 30 percent of child deaths worldwide are caused by vaccine-preventable diseases (UNICEF, 2021).

The number of children immunized across the globe dropped sharply from 86 percent in 2019 to 83 percent in 2020, the first such decline in almost 3 decades. This decline is the result of disruptions to immunization programs because of the COVID-19 pandemic. For instance, in one recent survey, 68 out of 82 countries reported disruptions to their immunization campaigns. Moreover, in some countries, health care services have been disrupted or difficult to access due to war and conflict. Disruptions such as this have led to 23 million children under the age of 1 year failing to receive their basic vaccines. Still, 83 percent of infants worldwide—113 million—received routine vaccinations during their 1st year in 2020 (World Health Organization, 2021; World Health Organization, 2020).

Prior to the COVID-19 pandemic, over 90 percent of American 19- to 35-month-olds had completed a recommended series of childhood vaccinations, including measles, mumps, rubella, hepatitis B, and chicken pox (Centers for Disease Control and Prevention, 2018). However, emerging data suggests immunization rates in the United States have declined, placing the American public at risk of additional disease outbreaks. A comparison of vaccination rates from spring 2020 to spring 2021 showed immunizations for measles, mumps, and rubella dropped by 22.4 percent among children aged birth to 1 year, and doses of diphtheria, tetanus, and pertussis vaccines dropped by 15.7 percent in children under the age of 2 years (Rabin, 2021). Currently, exemptions for religious or philosophical reasons are allowed in many states, and in some areas, the exemption rate is as high as 20 percent (Ventola, 2016).

Vaccine hesitancy—defined as the reluctance or refusal to vaccinate despite availability—is a key reason many American children are not protected and has been named as one of the World Health Organization's top 10 threats to global public health (World Health Organization, 2021). Vaccine hesitancy was a concern prior to the pandemic and has now become an even more pressing issue. Widespread immunization across the globe is vital to preventing COVID-19 infection and transmission, as well as reducing the chances another harmful variant emerges.

Some parents hesitate to immunize their children because of speculation that certain vaccines—particularly the diphtheria-pertussis-tetanus (DPT) and measles-mumps-rubella (MMR) vaccines—may cause autism or other neurodevelopmental disorders. However, there is no empirical evidence that this link exists. A meta-analysis representing data from more than 1.26 million children showed no link between autism, autism-spectrum disorders, intellectual disability, and vaccines (Taylor et al., 2014). Despite this data, many parents elect not to vaccinate their children or vaccinate them incompletely or on a delayed schedule.



*The rates of infectious diseases have plummeted in the United States thanks to widespread immunization, but many children are still not fully protected.*

Ian Hooton/Science Photo Library/Science Source

Research across low-, middle- and high-income countries has shown all countries have shown declining immunization rates, but the reasons people refuse or accept vaccinations vary across countries. Individuals in low-income countries tend to accept vaccinations at higher rates than those in high-income countries. That acceptance appears to be based on concerns related to personal protection against disease, perhaps as a result of living in areas where vaccine-preventable illnesses still cause frequent death. By contrast, in high-income countries, where many diseases have been eradicated with vaccines and their memory has faded from the public consciousness, concerns about side effects are most frequently cited in immunization decisions (Machingaidze & Wiysonge, 2021). Declining vaccine rates are a worrisome trend, as low immunization rates risk not only the global pandemic response but will also lead to thousands of needless deaths.

The 1998 article by Dr. Andrew Wakefield that first linked autism and vaccines was retracted in February 2010 by *The Lancet* amid allegations of bias and unethical conduct by Wakefield. Unfortunately, his influence still holds in the anti-vaccine movement.



## checkpoint can you ...

- Explain why full immunization of all infants and preschoolers is important?

# Early Physical Development

The first three years are a time of explosive growth and development. Despite its rapid growth, however, the developing body grows in an orderly and patterned way.

## PRINCIPLES OF DEVELOPMENT

As before birth, physical growth and development follow the **cephalocaudal principle** and the **proximodistal principle**.

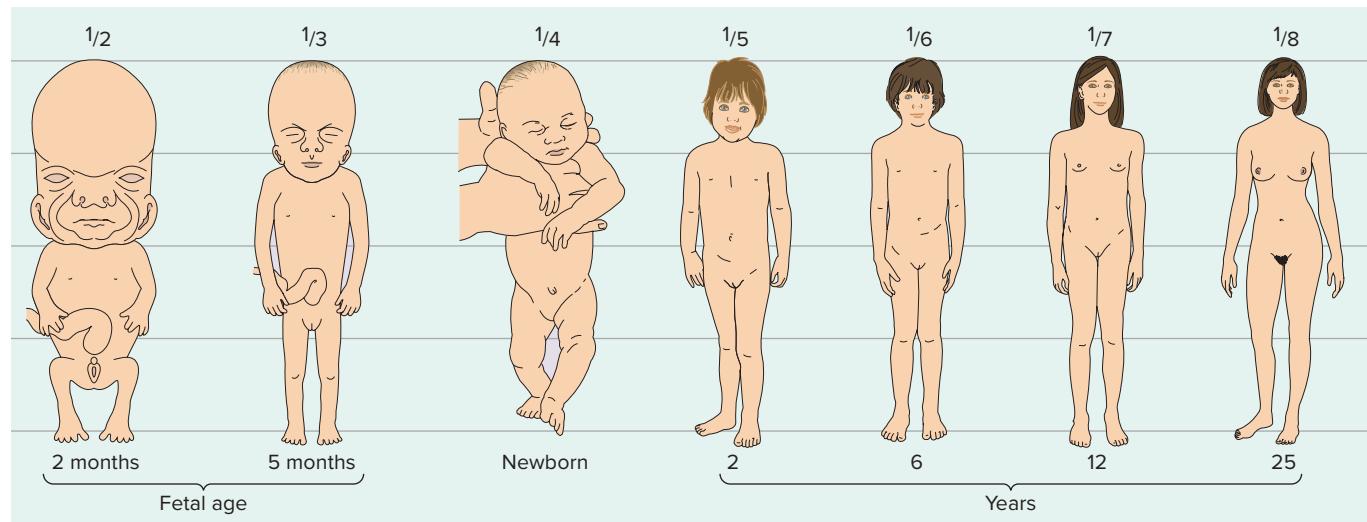
According to the cephalocaudal principle, growth occurs from the top down. Because the brain grows rapidly before birth, a newborn baby's head is disproportionately large. The head becomes proportionately smaller as the child grows in height and the lower parts of the body develop (Figure 8). Sensory and motor development proceed according to the same principle: Infants learn to use the upper parts of the body before the lower parts. So, for example, a baby learns to use their arms for grasping prior to learning to use their legs for walking and holds their head up before they can sit unaided.

### cephalocaudal principle

Principle that development proceeds in a head-to-tail direction; that is, upper parts of the body develop before lower parts of the trunk.

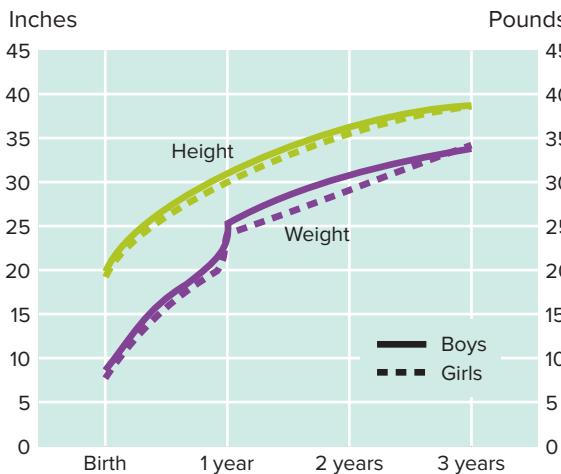
### proximodistal principle

Principle that development proceeds from within to without; that is, parts of the body near the center develop before the extremities.



**FIGURE 8**

Changes in Proportions of the Human Body during Growth



**FIGURE 9**

### Growth in Height and Weight during Infancy and Toddlerhood

Babies grow most rapidly in both height and weight during the first few months of life and then taper off somewhat by age 3. Baby boys are slightly larger, on average, than baby girls.

Note: Curves shown are for the 50th percentiles for each sex.

### checkpoint can you ...

- ▶ Summarize typical patterns of physical growth and change during the first 3 years?
- ▶ Identify factors that affect growth?

According to the proximodistal principle (inner to outer), growth and motor development proceed from the center of the body outward. In the womb, the head and trunk develop before the arms and legs, then the hands and feet, and then the fingers and toes. During infancy and early childhood, the limbs continue to grow faster than the hands and feet. Babies learn to use the parts of their bodies closest to the center of their body before they learn to use the outermost parts. For example, babies first learn to control their arms when reaching, then use their hands in a scooping motion, then finally learn to use their thumb and pointer finger in a pincer grip.

### PHYSICAL GROWTH

Children grow faster during the first 3 years, especially during the first few months, than they ever will again (Figure 9). This rapid growth tapers off during the 2nd and 3rd years. Boys are typically slightly taller and heavier than girls at most ages. As a baby grows into a toddler, body shape and proportions change too; a 3-year-old typically is slender compared with a chubby, potbellied 1-year-old.

The genes an infant inherits have a strong influence on whether the child will be tall or short, thin or stocky, or somewhere in between. This genetic influence interacts with such environmental influences as nutrition and living conditions. Today children in many high-income countries are growing taller and maturing at an earlier age than children did a century ago, primarily because of better nutrition, improved sanitation and medical care, and the decrease in child labor. However, many children in low-income countries still suffer from malnutrition, wasting, or stunting.

Teething usually begins around 3 or 4 months, when infants begin grabbing almost everything in sight to put into their mouths, but the first tooth may not actually arrive until sometime between 5 and 9 months or even later. By their first birthday, babies generally have 6 to 8 teeth; by age 2½, they have a mouthful of 20. In medieval Europe, teething was believed to lead to illness or death (Fontanel & d'Hartcourt, 1997); these beliefs are shared by some indigenous cultures and immigrant groups today. These concerned parents, when faced with a sick baby, will sometimes opt to remove teeth or tooth buds, usually the canines, in their child (Garve et al., 2016; Elgamri et al., 2018).

### NUTRITION

Optimal growth and brain development require the proper mix of vitamins, minerals, calories, and high-quality protein sources. Failure to secure these essential substances can have effects lasting far past the early years in areas as diverse as cognitive development, physical health, work capacity, and earning power (Habicht & Martorell, 2010).

**Breast or Bottle?** Through most of human history, all babies were breastfed. Breastfeeding is almost always best for infants (Box 1). However, only 44 percent of infants across the globe are exclusively breastfed. This is unfortunate, as the lives of approximately 820,000 children could be saved every year if all children under the age of 2 were optimally breastfed (World Health Organization, 2021).

In the first decade of the twentieth century, the advent of dependable refrigeration, pasteurization, and sterilization led to the development of formulas to modify and enrich cow's milk for infant consumption. During the next half-century, formula feeding became the norm in the United States and many other industrialized countries. By 1971, only 25 percent of US mothers even tried to nurse (Ryan, 1997). The realization that breastfeeding provided the optimal nutrition for babies led to a United Nations initiative encouraging institutional support of breastfeeding in 1991 (Meredwood et al., 2005). By 1992–1993, approximately 60 percent of American infants were breastfed (McDowell et al., 2008). Rates continued to rise, and approximately 84 percent of American newborns are breastfed at some point (Centers for Disease Control and Prevention, 2021).

Increases in breastfeeding in the United States are most notable in socioeconomic groups that historically have been less likely to breastfeed: Black women, teenage women, poor women, working women, and those with no more than high school education. Despite this, however, many women do not breastfeed or do not breastfeed exclusively for the recommended 6 months. Moreover, there are differences among ethnic groups; Black women are the least likely to breastfeed, whereas Hispanic women, particularly if they speak Spanish, breastfeed at high levels (McKinney et al., 2016).

Postpartum maternity leave, flexible scheduling, the ability to take relatively frequent and extended breaks at work to pump milk, privacy for nursing mothers at work and at school, as well as education about the benefits of breastfeeding, and availability of breast pumping facilities would increase the prevalence of breastfeeding (Dinour & Szaro, 2017). However, other important variables must be considered. For example, welfare reform laws that require new mothers to return to work rapidly interfere with the establishment of a milk supply (Bentley et al., 2003), and although there is a relationship between going back to work and the cessation of breastfeeding in all groups, Black mothers are more likely to report going back to work as the primary reason for discontinuing breastfeeding (Dagher et al., 2016; Hurley et al., 2008). Culturally variable perceptions of the breast as sexual and of breastfeeding as painful or difficult, along with a lack of role models and aggressive marketing of formula, interact with structural barriers to make breastfeeding difficult for some women to maintain (Bentley et al., 2003).

Contraindications for breastfeeding are rare. Breastfeeding is inadvisable if a baby has been diagnosed with galactosemia (a genetic metabolic disorder), if the mother is infected with the HIV virus, Ebola, or any other infectious illness, if she has been exposed to radiation, or if she is taking any drug that would not be safe for the baby (Centers for Disease Control and Prevention, 2021). The risk of transmitting HIV infection to an infant



Breast milk can be called the “ultimate health food” because it offers so many benefits to babies—physical, cognitive, and emotional.  
Westend61/Getty Images



As newborns age into infants and then toddlers, their nutritional needs change. So, too, does their mother’s milk. As children grow bigger, their bodies require more energy, and the fat and protein in breast milk rise in concert with their needs (Czosnykowska-Lukacka et al., 2018).

## BOX 1 Benefits of Breastfeeding

### Breastfed Babies . . .

1. Are less likely to contract infectious illnesses such as diarrhea; respiratory infections; otitis media (an infection of the middle ear); and staphylococcal, bacterial, and urinary tract infections.
2. Have a lower risk of SIDS and of postneonatal death.
3. Are less likely to develop obesity, diabetes, or childhood cancer.
4. Perform better on IQ and cognitive tests.
5. Have fewer cavities.

### Breastfeeding Mothers . . .

1. Enjoy quicker recovery from childbirth with less risk of postpartum bleeding.
2. Are more likely to return to their prepregnancy weight and less likely to develop long-term obesity.
3. Have reduced risk of anemia and lowered risk of repeat pregnancy while breastfeeding.
4. Are less likely to develop osteoporosis or ovarian and premenopausal breast cancer.

Sources: World Health Organization (2021); Centers for Disease Control and Prevention (2021); Binns et al. (2016).

continues as long as an infected mother breastfeeds, and in the United States, where clean water and formula are available, the risk of transmission is not worth the benefits associated with breastfeeding (Centers for Disease Control and Prevention, 2020). However, in many developing countries, the risk of disease or death without breastfeeding outweighs that of contracting HIV, and mothers are encouraged to breastfeed, ideally while complying with an antiretroviral medication protocol. When the protocol is followed, as it is by almost 80 percent of pregnant or breastfeeding mothers, the risk of contagion is low (Global Breastfeeding Collective et al., 2018).

Ideally, new mothers should attempt to avoid any kind of illness or infection, a proposition that became more challenging during the COVID-19 pandemic. However, preliminary evidence indicates that the COVID-19 virus is not found in breast milk (Sokou et al., 2021), and thus, new mothers are advised to breastfeed when possible. If infected mothers choose to directly breastfeed, it is recommended they wash their hands before contact with their children, wear a face mask, or, alternatively, use a breast pump to express milk and have a noninfected person feed the child (Centers for Disease Control and Prevention, 2021). There are some indications that antibodies—whether from previous infection or vaccination—may be vertically transmitted to infants through breast milk (Perl et al., 2021), a further benefit derived from breastfeeding.

**Solid Foods** Healthy babies should consume nothing but breast milk or iron-fortified formula for the first 6 months. Pediatric experts recommend that iron-enriched solid foods be introduced gradually during the second half of the 1st year. Water may be introduced at this time as well. Children should be offered 2 to 3 healthy snacks a day and can be encouraged to feed themselves and drink from a cup (American Academy of Pediatrics, 2021).

Unfortunately, while there have been improvements in what young children eat in the past decade, many parents do not follow recommendations. According to randomized telephone interviews with parents and caregivers of more than 3,000 US infants and toddlers, 17 percent of infants are given solid food before 4 months, 5.5 percent drink fruit juice before 6 months, and 17 percent drink cow's milk before 12 months. Moreover, most young children do not eat enough fruits or vegetables, or a sufficient variety of vegetables, and, as they age into toddlerhood, many consume increasing amounts of sugar-sweetened beverages (Roess et al., 2018).

**Obesity** Obesity, defined in infants as having a weight for height in the 95th percentile, has increased in infancy as it has in all age groups in the United States. The prevalence of obesity in American children aged 2 and under is almost 10 percent (Fryar et al., 2018), with the highest rates found in American Indians or Alaska Natives and Latinos and the lowest rates in Asian American children (Isong et al., 2018). Obesity is not just a problem for Americans; 39 million children under the age of 5 across the globe were overweight or obese in 2020, almost half of whom lived in Asia (World Health Organization, 2021).



A child under age 3 with an obese parent is likely to become obese as an adult, regardless of the child's own weight.

Kletr/Shutterstock

A recent review including data from 282 studies identified a variety of risk factors found in infants and toddlers from 0 to 2 years of age that are associated with later risk of obesity in children. Children born to mothers who had a higher prepregnancy body mass index (BMI) or who gained a great deal of weight during the pregnancy were at higher risk, as were infants who weighed a great deal at birth or gained weight quickly as infants. Additionally, prenatal tobacco exposure was also implicated. Other factors were associated but not as strongly. These included a maternal diagnosis of gestational diabetes, enrollment in child care, inappropriate bottle use, being introduced to solid food before the age of 4 months, and the use of antibiotics for the infant (Baidal et al., 2016). Generally, data support the finding that efforts to prevent obesity in children are most likely to be successful if they begin earlier in life (Cheung et al., 2016).

**Malnutrition** Although infants and toddlers in the United States may eat too much, those in many low-income communities around the world may not eat enough. Chronic malnutrition is caused by factors such as poverty, low-quality foods, poor dietary patterns, contaminated water, unsanitary conditions, insufficient hygiene, inadequate health care, and diarrheal diseases and other infections.

Approximately 2.7 million children around the world die each year from undernutrition, accounting for 45 percent of all deaths of children under 5. Moreover, an additional 149 million children are stunted (too short for their age), and another 45 million are wasted (too thin for their height) (World Health Organization, 2021). Most malnourished children live in Africa and Asia, and some children may suffer from stunting and wasting simultaneously (UNICEF et al., 2021). Malnutrition is not confined to developing countries. In the United States, almost 15 percent of households with children are food insecure (US Department of Agriculture, 2022).

Protein is important for growth. A long-term longitudinal study conducted in Guatemalan villages showed that protein supplementation in early childhood resulted in substantial improvements in cognitive skills, physical development, and economic productivity in children at risk for malnutrition. The children who received the protein supplementation were taller, had better performance on a wide variety of cognitive tasks, and had greater fat-free mass. As adults, they were at lower risk of living in poverty and (in men) showed greater work capacity (Martorell, 2016).

However, the positive effects of supplementation occurred only for those children who participated in the study before the age of 3 years—roughly the first 1000 days. But why? First, this is a time of exceedingly rapid physical growth and brain development. Thus, any deficiencies encountered during this time period are likely to have a stronger effect. This rapid growth also implies increased caloric requirements relative to body size, making younger children even more vulnerable to deprivation. Second, young children have greater susceptibility to infections, such as diarrheal diseases, that can impact their ability to digest nutrients. Last, younger children are more dependent upon others to take care of their needs and thus are less able to take compensatory action (Martorell, 2016).

## BUILDING THE BRAIN

The **central nervous system** includes the brain and spinal cord (a bundle of nerves running through the backbone), as well as a peripheral network of nerves extending to every part of the body. Through this network, sensory messages travel to the brain, and motor commands travel back.

At birth, an infant's brain is about 25 percent of its eventual adult volume. By a year of age, it has reached 70 percent of its eventual size, and by the age of 2, the typical child's brain will be about 80 percent of its eventual adult size. However, specific parts of the brain continue to grow and develop functionally into adulthood (Tau & Peterson, 2010).

**Brain Anatomy and Development** Beginning about 3 weeks after conception, the brain gradually develops from a long, hollow tube into a spherical mass of cells (Figure 10). By birth, the growth spurt of the spinal cord and brain stem (the part of the brain responsible for such basic bodily functions as breathing, heart rate, body temperature, and the sleep-wake cycle) has nearly run its course. The cerebellum (the part of the brain that maintains balance and motor coordination) grows fastest during the 1st year of life (Monk & Hane, 2016).

The cerebrum, the largest part of the brain, is divided into right and left halves, or hemispheres, each with specialized functions. This specialization of the hemispheres is called **lateralization**. The left hemisphere is mainly concerned with language and logical thinking, the right hemisphere with visual and spatial functions such as map reading and drawing. Joining the two hemispheres is a tough band of tissue called the corpus callosum. The corpus callosum is like a giant switchboard of fibers connecting the hemispheres and allowing them to share information and coordinate commands.

## checkpoint can you...

- Summarize pediatric recommendations regarding early feeding and the introduction of cow's milk and solid foods?
- Cite factors that contribute to obesity in later life?
- Discuss the damaging effects of malnutrition early in life?

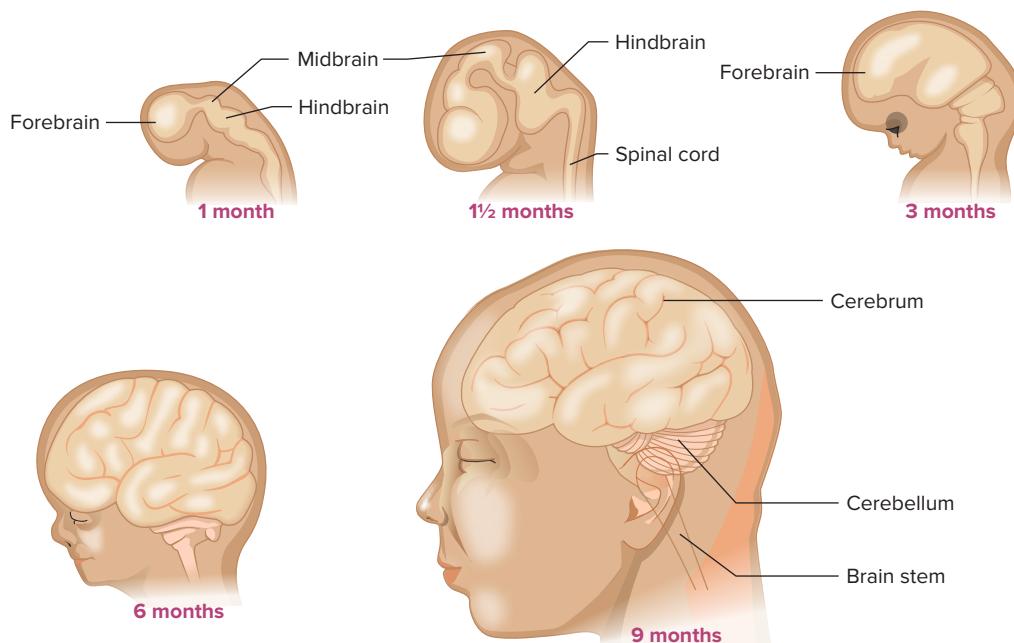
**central nervous system**  
Brain and spinal cord.

**lateralization**  
Tendency of each of the brain's hemispheres to have specialized functions.

**FIGURE 10**

## Brain Development during Gestation

Fetal nervous system development begins at about 3 weeks. At 1 month, major regions of the brain appear: the forebrain, midbrain, and hindbrain. As the brain grows, the front part expands to form the cerebrum, the seat of conscious brain activity. The cerebellum grows most rapidly during the 1st year of life.



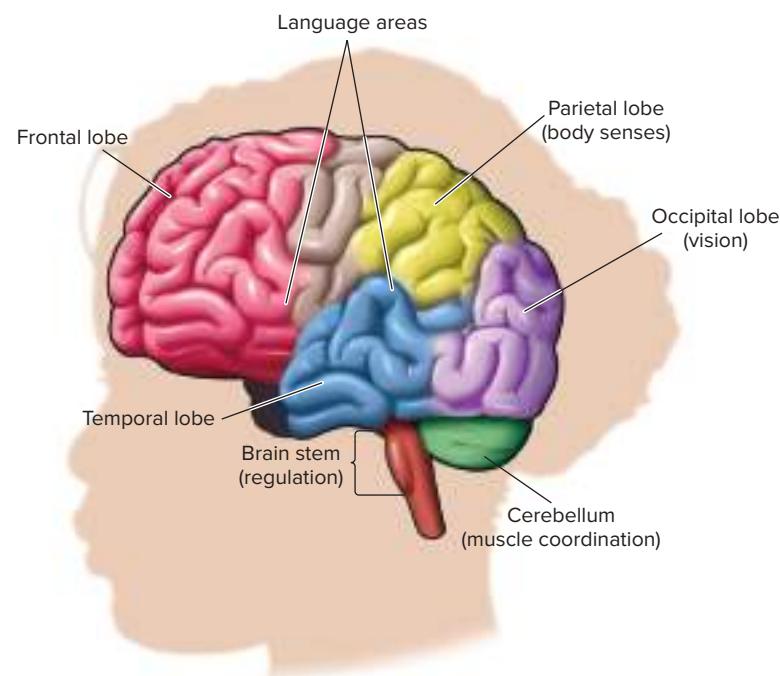
Source: Cowan (1979).

**neurons**

Nerve cells.

**FIGURE 11**

## The Human Brain



Each cerebral hemisphere has four lobes or sections, which control different functions. They include the occipital, parietal, temporal, and frontal lobes (Figure 11). The occipital lobe is the smallest of the four lobes and is primarily concerned with visual processing. The parietal lobe is involved with integrating sensory information from the body. It helps us move our bodies through space and manipulate objects in our world. The temporal lobe helps us interpret smells and sounds and is involved in memory. The frontal lobes, the newest region of the brain, are involved with a variety of higher-order processes, such as goal setting, inhibition, reasoning, planning, and problem solving. The regions of the cerebral cortex (the outer surface of the cerebrum) that govern vision, hearing, and other sensory information grow rapidly in the first few months after birth

and are mature by age 6 months, but the areas of the frontal cortex responsible for abstract thought, mental associations, remembering, and deliberate motor responses grow very little during this period and remain immature for several years (Gilmore et al., 2007).

**Brain Cells** The brain is composed of neurons and glial cells. **Neurons**, or nerve cells, send and receive information. Glia, or glial cells, nourish and protect the neurons. They are the support system for our neurons.

Beginning in the 2nd month of gestation, an estimated 250,000 immature neurons are produced every minute through cell division (mitosis). At birth, most of the more than 100 billion neurons in a mature brain are already formed but are not yet fully developed. The number of neurons increases most rapidly between the 25th week of gestation and the first few months after birth. This cell proliferation is accompanied by a dramatic growth in cell size.

Initially, the neurons are simply cell bodies with a nucleus, or center, composed of deoxyribonucleic

acid (DNA), which contains the cell's genetic programming. As the brain grows, these rudimentary cells migrate to various parts of the brain (Bystron et al., 2006). Most of the neurons in the cortex are in place by 20 weeks of gestation, and the cortex's structure becomes fairly well-defined during the next 12 weeks.

Once in place, the neurons sprout axons and dendrites—narrow, branching, fiberlike extensions. Axons send signals to other neurons, and dendrites receive incoming messages from them, through synapses, tiny gaps, which are bridged with the help of chemicals called neurotransmitters that are released by the neurons. Eventually, a particular neuron may have anywhere from 5,000 to 100,000 synaptic connections.

The multiplication of dendrites and synaptic connections, especially during the last 2½ months of gestation and the first 6 months to 2 years of life, accounts for much of the brain's growth and permits the emergence of new perceptual, cognitive, and motor abilities. As the neurons multiply, migrate to their assigned locations, and develop connections, they undergo the complementary processes of integration and differentiation. Through **integration**, the neurons that control various groups of muscles coordinate their activities. Through **differentiation**, each neuron takes on a specific, specialized structure and function.

At first, the brain produces many more neurons and synapses than it needs. The large number of excess neurons provided by this early proliferation give the brain flexibility: With more connections available than will ever be needed, many potential paths are open for the growing brain. As early experience shapes the brain, the paths are selected, and unused paths are pruned away. This process involves **cell death**, which may sound negative but is a way to calibrate the developing brain to the local environment and help it work more efficiently. This process begins during the prenatal period and continues after birth.

Only about half the neurons originally produced survive and function in adulthood (Society for Neuroscience, 2008). Yet, even as unneeded neurons die out, others may continue to form during adult life (Deng et al., 2010). Meanwhile, connections among cortical cells continue to strengthen and to become more reliable and precise, enabling more flexible and more advanced motor and cognitive functioning (Society for Neuroscience, 2008). Our flexibility is a double-edged sword. The brain's amazing plasticity implies people are vulnerable to negative environmental experiences; however, it also suggests great recovery is possible in those who have experienced difficulties and accounts for our ability to adapt to a wide variety of cultural experiences.

**Myelination** Much of the credit for efficiency of neural communication goes to the glia that coat the neural pathways with a fatty substance called myelin. This process of **myelination** enables signals to travel faster and more smoothly. Myelination begins about halfway through gestation. It continues to form rapidly throughout infancy, accelerating at 12 to 16 months and then slowing again from 2 to 5 years of age (Dubois et al., 2014). At 5 years of age, the myelinated white matter volume in the brain is approximately 80 percent of that found in adults (Deoni et al., 2011). Myelination continues through adolescence and persists through the third decade of life (Bartzokis et al., 2010).

In the fetus, myelin development progresses from the center out. Sensory pathways, including the somatosensory, visual, and auditory pathways, are generally myelinated before motor pathways, and the occipital pole (the posterior end of the occipital lobe) is myelinated before the temporal and frontal poles. Last, projection fibers (nerve tracts that connect the cortex with lower parts of the brain and spinal cord) are myelinated prior to association fibers (nerve tracts that connect cortical areas within the cerebral hemisphere) (Qui et al., 2015). It has been argued that this sequence exists because before higher cortical areas can use information, they must be able to access stable inputs. Therefore, the primary cortical areas are myelinated first (Guillory, 2005).

**Early Reflexes** When your pupils contract as you turn toward a bright light, they are acting involuntarily. Such an automatic, innate response to stimulation is called a **reflex behavior**. Reflex behaviors are controlled by the lower brain centers that govern other involuntary processes, such as breathing and heart rate.



As an analogy, think of this as a sports team. Integration involves all members of the team learning to work together in a coordinated fashion. Differentiation involves each team member taking on a specific position to play.

#### integration

Process by which neurons coordinate the activities of muscle groups.

#### differentiation

Process by which cells acquire specialized structures and functions.

#### cell death

In brain development, normal elimination of excess brain cells to achieve more efficient functioning.

#### myelination

Process of coating neural pathways with a fatty substance called myelin, which enables faster communication between cells.



Myelin is made primarily of fat. As breast milk is designed to be ideal for a baby's nutrition, it contains relatively high but healthy levels of this essential ingredient.

#### reflex behaviors

Automatic, involuntary, innate responses to stimulation.

**TABLE 4** Early Human Reflexes

Reflex	Stimulation	Baby's Behavior	Typical Age of Appearance	Typical Age of Disappearance
<b>Moro</b>	Baby is dropped or hears loud noise.	Extends legs, arms, and fingers, arches back, draws back head	7th month of gestation	3 months
<b>Darwinian (grasping)</b>	Palm of baby's hand is stroked.	Makes strong fist; can be raised to standing position if both fists are closed around a stick	7th month of gestation	4 months
<b>Tonic neck</b>	Baby is laid down on back.	Turns head to one side, assumes "fencer" position, flexes opposite limbs	7th month of gestation	5 months
<b>Babinski</b>	Sole of baby's foot is stroked.	Toes fan out; foot twists in.	Birth	4 months
<b>Rooting</b>	Baby's cheek or lower lip is stroked with finger or nipple.	Head turns; mouth opens; sucking movements begin.	Birth	9 months
<b>Walking</b>	Baby is held under arms, with bare feet touching flat surface.	Makes steplike motions that look like well-coordinated walking	1 month	4 months
<b>Swimming</b>	Baby is put into water face down.	Makes well-coordinated swimming movements	1 month	4 months



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Moro reflex

Darwinian reflex

Tonic neck reflex



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Babinski reflex

Rooting reflex

Walking reflex



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Human infants have an estimated 27 major reflexes (Table 4), many of which are present at birth or soon after (Noble & Boyd, 2012). Primitive reflexes such as sucking and rooting for the nipple are related to instinctive needs for survival and protection. Some primitive reflexes may be part of humankind's evolutionary legacy. One example is the grasping reflex, which enables infant monkeys to hold on to their mothers' fur.

Human infants show a similar reflex wherein they tightly grasp any object placed in their palm, a holdover from our ancestral past.

As the higher brain centers become active during the first 2 to 4 months, infants begin to show postural reflexes: reactions to changes in position or balance. For example, infants who are tilted downward extend their arms in the parachute reflex, an instinctive attempt to break a fall. Locomotor reflexes, such as the walking and swimming reflexes, resemble voluntary movements that do not appear until months after the reflexes have disappeared.

Most of the early reflexes disappear during the first 6 to 12 months. Reflexes that continue to serve protective functions—such as blinking, yawning, coughing, gagging, sneezing, shivering, and dilation of the pupils in the dark—remain. Disappearance of unneeded reflexes on schedule is a sign that motor pathways in the cortex have been partially myelinated, enabling a shift to voluntary behavior. Thus, we can evaluate a baby's neurological development by seeing whether certain reflexes are present or absent.

**Brain Plasticity** Our brains are not static; rather, they are living, changeable organs that respond to environmental influences and are a reflection of our experiences. The technical term for this malleability of the brain is **plasticity**. Plasticity may be an evolutionary mechanism to enable adaptation to environmental change (Sherwood & Gomez-Roble, 2017).

Plasticity enables learning. Indeed, individual differences in intelligence may reflect differences in the brain's ability to develop neural connections in response to experience (Brant et al., 2013; Garlick, 2003). Early experience can have lasting effects on the capacity of the central nervous system to learn and store information. But there are two sides to every coin. Just as plasticity allows learning in response to appropriate environmental input, it can also lead to damage in the case of harmful input. During the formative period of early life when the brain is most plastic, the brain is especially vulnerable. Exposure to hazardous drugs, environmental toxins, or maternal stress before or after birth can threaten the developing brain, and malnutrition can interfere with normal cognitive growth. Early abuse or sensory impoverishment can leave an imprint on the brain as it adapts to the environment in which the developing child must live, delaying neural development or affecting brain structure (Kolb et al., 2017).

By the same token, enriched experience can spur brain development and even make up for past deprivation. Animals raised in social groups in toy-filled cages allowing for interaction and exercise have bigger brains and sprout more axons, dendrites, and synapses than animals raised alone in bare cages (Cioni et al., 2016). Such findings have sparked successful efforts to stimulate the brain development of preterm infants, children with Down syndrome, and children with cerebral palsy (Guzzetta et al., 2011; Cué & Dierssen, 2020; Morgan et al., 2013).

Ethical constraints prevent controlled experiments on the effects of environmental deprivation on human infants. However, the discovery of thousands of infants and young children raised in overcrowded Romanian orphanages offered a natural experiment. The children were raised in orphanages under impoverished conditions, spending much of their time lying quietly in their cribs or beds with nothing to look at. As they aged, the children showed a wide range of impairments, including lower IQ, smaller brains, difficulties with attachment, attentional issues, poor executive control, and autistic-like social abnormalities (Almas et al., 2016; Nelson et al., 2017).

Some of these children were placed in adoptive homes in Canada or the United Kingdom. Romanian orphans adopted before age 6 months showed no cognitive impairment by age 11 as compared with a control group of English children adopted within the United Kingdom. By contrast, the average IQs of Romanian children adopted into English families after age 6 months were 15 points lower. At ages 6 and 11, the latest-placed adoptees were the most cognitively impaired (Beckett et al., 2006). These findings suggest that a high-quality foster care or adoptive home may partly overcome the adverse effects of early institutionalization. Both the Romanian children's failure to develop typically in a deprived environment and their ability to show recovery when placed in a high-quality environment illustrate the great plasticity of the human brain.

## checkpoint can you...

- Describe early brain development?
- Explain the functions of reflex behaviors and why some drop out?

### plasticity

- (1) Range of modifiability of performance.
- (2) Modifiability, or "molding," of the brain through experience.

## checkpoint can you...

- Discuss how early experience can affect brain growth and development both positively and negatively and give examples?

## EARLY SENSORY CAPACITIES

The regions of the developing brain that control sensory information grow rapidly during the first few months of life, enabling newborn infants to make fairly good sense of what they touch, see, smell, taste, and hear.

**Touch and Pain** Anytime you have comforted a crying baby by cuddling them or tickled a drowsy child to wake them up, you have made use of perhaps the most important sense in infancy: touch. **Embryos will respond to touch as early as 8 to 9 weeks of pregnancy; however, these responses do not involve any conscious awareness** (Humphrey, 1970). In the second trimester of the pregnancy, fetuses begin to respond to touch, as when a pregnant mother rubs her belly, by moving their arms, head, or mouth. In the third trimester, response to touch becomes more robust, and fetuses also reach out to touch the uterine wall, yawn, cross their arms, or touch themselves (Marx & Nagy, 2015; 2017). By 32 weeks of gestation, all body parts are sensitive to touch, and this sensitivity increases during the first 5 days of life (Haith, 1986).

In the past, physicians performing surgery on newborn babies, such as circumcision, often used no anesthesia in the mistaken belief that neonates could not feel pain, felt it only briefly, or did not have the memory capacity to remember and thus be affected by it. However, as discussed in Chapter 3, there is evidence that the capacity for pain perception emerges sometime in the third trimester of pregnancy and is present by birth. Newborns can and do feel pain, and they become more sensitive to it during their first few days. Anesthesia is dangerous for young infants, however, so when possible, alternative methods of pain management are used for minor procedures such as circumcision, a heel stick, or vaccines. For example, infants show a decreased pain response when they are held or cuddled, especially with skin-to-skin contact, and either breastfed or given a sweet solution to suck on (Riddell et al., 2015).

**Smell and Taste** The senses of smell and taste begin to develop in the womb. Flavors from food the mother has consumed are found in amniotic fluid (Cooke & Fildes, 2011). Thus, a preference for certain tastes and smells can be developed in utero. Moreover, flavors from the foods that the mother eats are also transmitted via breast milk (Ventura & Worobey, 2013). Therefore, exposure to the flavors of healthy foods through breastfeeding may improve acceptance of healthy foods after weaning and later in life (Dunn & Lessen, 2017).

**The taste preferences developed in infancy may last into early childhood; children offered different flavors in early infancy later have less restricted food preferences** (Paroche et al., 2017). **For example, babies offered fruits and vegetables for their first foods are more likely to later consume more and more varied fruits and vegetables than babies offered cereal for their first meals** (Moss et al., 2020). This process allows for the cultural programming of food preferences.

Other taste preferences seem to be largely innate and reflect an adaptive preference for signals for high-calorie, high-protein foods and an aversion toward a food that may be poisonous or toxic (Ventura & Worobey, 2013). These preferences exist most strongly for sweet and bitter flavors (Mennella & Bobowski, 2015). Newborns much prefer sweet tastes to sour, bitter, or salty tastes (Mennella, 2014). Newborns also strongly dislike bitter flavors, likely a survival mechanism, given the toxic nature of many bitter substances (Beauchamp & Mennella, 2011).

**Hearing** Even in the womb, fetuses respond to sound, as indexed by changes in brain activity, heart rate, or physical movements. They respond differentially to familiar versus unfamiliar voices, live versus recorded maternal voice, and native versus nonnative language (Carvalho et al., 2019).

Auditory discrimination develops rapidly after birth. Infants as young as 2 days old are able to recognize a word they heard up to a day earlier (Swain et al., 1993). At 1 month, babies can distinguish sounds as close as *ba* and *pa* (Eimas et al., 1971). By 11 to 17 weeks, infants are able to both recognize and remember entire sentences after

a brief delay (Dehaene-Lambertz et al., 2006). By 4 months, infants' brains are showing lateralization for language, as occurs in adults. By this age, the left side of infants' brains responds preferentially to speech, especially that of their native language, over other sounds (Minagawa-Kawai et al., 2010). There are even indications that infants can recognize music that is typical of their culture from a young age (Virtala et al., 2013) and by 4 months of age prefer music typical of their cultural experiences (Soley & Hannon, 2010).

Because hearing is a key to language development, hearing impairments should be identified as early as possible. Hearing loss occurs in 1 to 2 of 1,000 live births in developed countries and is slightly higher in developing countries (Shibani Kanungo & Patel, 2016).

**Sight** Vision is the least developed sense at birth, perhaps because there is so little to see in the womb. Visual perception and the ability to use visual information—identifying caregivers, finding food, and avoiding dangers—become more important as infants become more alert and active.

The eyes of newborns are smaller than those of adults, the retinal structures are incomplete, and the optic nerve is underdeveloped. A neonate's eyes focus best from about 1 foot away—just about the typical distance from the face of a person holding a newborn. Newborns blink at bright lights. Their field of peripheral vision is very narrow; it more than doubles between 2 and 10 weeks (Tronick, 1972) and is well developed by 3 months (Maurer & Lewis, 1979). The ability to follow a moving target also develops rapidly in the first months, as does color perception (Haith, 1986). The development of these abilities is tied closely to cortical maturation (Braddick & Atkinson, 2011).

Visual acuity at birth is approximately 20/400 but improves rapidly, reaching the 20/20 level by about 8 months (Kellman & Arterberry, 1998). Binocular vision—the use of both eyes to focus, enabling perception of depth and distance—usually does not develop until 4 or 5 months (Horwood, 2019).

Infants show a special affinity for faces. From the very beginning, infants prefer to look at and are able to discriminate between human faces more than almost any other stimuli (Sugden & Marquis, 2017). Infants also prefer to look at their own mother's face and the faces of attractive strangers more than unattractive strangers (Pascalis & Kelly, 2009). Within a few months after birth, infants begin to pay close attention to human eyes over other features (Dupierrix et al., 2014). Between about 4 to 8 months of age, when learning language, infants pay particular attention to the mouth. Then, at approximately a year of age, as they begin to master some of the basics of language, their attention shifts back to the eyes (Lewkowicz & Hansen-Tift, 2012).

Infants also show some ability to categorize racial groups on the basis of facial data. At 3 months, infants look longer at own-race faces, at least when raised by people who are the same race they are. By 9 months, they look longer at other-race faces and seem to process own-race faces more efficiently (Liu et al., 2015). Infants also seem to use own-race faces as a source of social information to a greater degree than other-race faces. For example, infants pay more attention to the eyes of someone of their own race (Xiao et al., 2013) and are more likely to follow the gaze of a same-race person than of an other-race person (Xiao et al., 2018). Moreover, using visual fixation as an index, they also seem to like own-race faces more, associating own-race faces with happy music but other-race faces with sad music (Xiao et al., 2018). These biases may be adaptive for socialization purposes but undergird the later development of racial and ethnic biases.

Early screening is essential to detect problems that interfere with vision. Infants should be examined by 6 months for visual fixation preference, ocular alignment, and signs of eye disease. Formal vision screening should begin by age 3 (American Optometric Association, 2018). Doctors' offices have modified eye charts for toddlers specifically for this purpose; in place of letters are shapes easily recognized by most toddlers such as stars, hearts, and circles.

### checkpoint can you...

- Give evidence for early development of the senses?
- Tell how breastfeeding plays a part in the development of smell and taste?
- List three ways in which newborns' vision is underdeveloped?

# Motor Development

Babies do not have to be taught such basic motor skills as grasping, crawling, and walking. They just need room to move and freedom to see what they can do.

## MILESTONES OF MOTOR DEVELOPMENT

### systems of action

Increasingly complex combinations of motor skills, which permit a wider or more precise range of movement and more control of the environment.

### Denver Developmental Screening Test

Screening test given to children 1 month to 6 years old to determine whether they are developing normally.

### gross motor skills

Physical skills that involve the large muscles.

### fine motor skills

Physical skills that involve the small muscles and eye–hand coordination.

Motor development is marked by a series of milestones: achievements that develop systematically, each newly mastered ability preparing a baby to tackle the next. Babies first learn simple skills and then combine them into increasingly complex **systems of action**, which permit a wider or more precise range of movement and more effective control of the environment. In developing the precision grip, for example, an infant first tries to pick things up with the whole hand, fingers closing against the palm. Later the baby masters the pincer grasp, in which thumb and index finger meet at the tips to form a circle, making it possible to pick up tiny objects.

The **Denver Developmental Screening Test** (Frankenburg et al., 1992) is used to chart progress between ages 1 month and 6 years and to identify children who are not developing normally. The test measures **gross motor skills** (those using large muscles), such as rolling over and catching a ball, and **fine motor skills** (using small muscles), such as grasping a rattle and copying a circle. It also assesses language development (for example, knowing the definitions of words) and personality and social development (such as smiling spontaneously and dressing without help).

Under the guidelines used for these milestones, approximately 50 percent of children will meet developmental markers by the stated age. In other words, about half of babies master the Denver skills before the ages given and about half afterward. Also, the Denver norms were developed with reference to a Western population and are not necessarily valid when assessing children from other cultures.

In part based on encouraging parents to seek intervention for delays earlier, new evidence-based guidelines have been developed that call for a greater proportion—75 percent—of children to reach the milestones by the stated age (Zubler et al., 2022). Some examples of these new milestones can be found in Table 5.

**Head Control** At birth, most infants can turn their heads from side to side while lying on their backs. When lying chest down, many can lift their heads enough to turn them.

**TABLE 5** Highlights of Motor Development

Average Age	Skills
2 months	Holds head up when on tummy, moves both arms and legs, opens hands briefly
4 months	Holds head steady without support, bats at or holds toy with hand, brings hands to mouth, pushes up to elbows when on tummy
6 months	Rolls from front to back, pushes up with straight arms when on tummy, leans on hands to support when sitting
9 months	Sits independently, uses fingers to “rake” food, moves objects from hand to hand
12 months	Pulls up to stand, cruises while holding onto furniture, drinks from a cup without a lid, uses pincer grip
15 months	Walks a few steps, uses fingers to eat food
18 months	Walks independently, scribbles, tries to use a spoon, climbs on and off furniture

Source: Zubler et al. (2022).

Within the first 2 to 3 months, they lift their heads higher and higher—sometimes to the point where they lose their balance and roll over on their backs. By 4 months, almost all infants can keep their heads erect while being held or supported in a sitting position.

**Hand Control** Babies are born with a grasping reflex. If the palm of an infant's hand is stroked, the hand closes tightly, and infants initially keep their hands fisted most of the time. At about 3 months, most infants will bat at objects and can grasp an object of moderate size, such as a rattle, but have trouble holding a small object. By about 4 months, babies keep their hands open the majority of the time and will deliberately hold and shake a rattle. At about 6 months, infants begin to grasp objects with one hand and transfer them to the other. When picking up small objects, they tend to use their hand like a rake. Between 7 and 11 months, their hands become coordinated enough to pick up a tiny object, such as a pea, using the pincer grasp, and they may begin throwing objects. By 15 months, the average baby can build a tower of three to four cubes. At slightly over 2 years, infants can put large beads on a string, unscrew a jar, and turn the pages of a book—although they aren't very good at these things yet. A few months after the 3rd birthday, the average toddler can copy a circle and cut with scissors fairly well (Gerber et al., 2010).

**Locomotion** After 3 months, the average infant begins to roll over deliberately (rather than accidentally, as before)—first from front to back and then from back to front. The average baby can sit without support by 6 months and can assume a sitting position without help by about 8 months. Shortly thereafter, most infants will achieve self-locomotion, perhaps by creeping on their bellies or by bear walking with all four limbs straight (Gerber et al., 2010).

This achievement of self-locomotion has striking cognitive and psychosocial benefits. Crawling infants become more sensitive to where objects are, how big they are, whether they can be moved, and how they look. Crawling helps babies learn to better judge distances and perceive depth. They learn to look to caregivers for clues as to whether a situation is secure or frightening—a skill known as social referencing (Campos et al., 2013).

**By holding onto a helping hand or a piece of furniture, the average baby can stand at a little past age 7 months. The average baby can let go and stand alone well at about 11½ months.**

All these developments lead up to the major motor achievement of infancy: walking. Humans begin to walk later than other species, possibly because babies' heavy heads and short legs make balance difficult. **For some months before they can stand without support, babies practice cruising while holding onto furniture. Soon after they can stand alone well, most infants take their first unaided steps. Within a few weeks, shortly after the first birthday, the average child is walking fairly well and thus achieves the status of toddler.**

During the 2nd year, toddlers refine their abilities. At 24 months, most children can climb stairs one at a time, putting one foot after another on each step. At 28 months, they can walk on tiptoe. At 30 months, most children begin to climb stairs with alternating feet, can jump, and can swing their arms in the opposite direction of their legs as they walk. At 3 years of age, the average child can balance on one foot briefly, pedal a tricycle, and go up and down stairs using a handrail (Gerber et al., 2010).

## MOTOR DEVELOPMENT AND PERCEPTION

Sensory perception enables infants to learn about themselves and their environment so they can make better judgments about how to navigate in it. Motor experience, together with awareness of their changing bodies, sharpens and modifies their perceptual understanding of what is likely to happen if they move in a certain way. This bidirectional connection between perception and action, mediated by the developing brain, gives infants much useful information about themselves and their world.



For the first 6 months of life, babies show a slight preference for turning their heads to the right rather than the left. Researchers have suggested that our adult propensity to kiss with our heads tilted to the right—as almost 80 percent of adults do—is a reemergence of this early bias (Karim et al., 2017).



Although we tend to think of crawling as a milestone of development, it is not universal. Some babies move directly from sitting or scooting to walking and skip crawling altogether.

When infants begin reaching for objects at 4 to 5 months, they are not initially very good at it. Their reaching trajectory generally contains multiple corrections and changes in direction before they are able to successfully grasp an object. For many years, researchers believed that reaching depended on the use of the eyes to guide the movement of the hands. However, as researchers investigated further, they began to doubt this assertion. For example, they realized young infants could locate unseen objects by sound and, at 6 months old, were better at reaching for objects in the dark than in the light (Berthier & Carrico, 2010).

More recently, researchers have realized that in younger infants, clumsy corrective movements are more likely to be illustrating immature cerebellar development. The immature cerebellum is only able to provide a rough guideline of movements used in reaching, which must be then corrected in order to be successful (Berthier, 2011). Younger infants are more likely to correct their reaching movements using proprioceptive feedback from their muscles and joints and haptic (relating to touch) information rather than vision. Rather than use their eyes to correct their movements, infants reach first, then the eyes follow (Corbetta, et al., 2014).

#### depth perception

Ability to perceive objects and surfaces three-dimensionally.

#### haptic perception

Ability to acquire information about properties of objects, such as size, weight, and texture, by handling them.

**Depth perception**, the ability to perceive objects and surfaces in three dimensions, depends on several kinds of cues that affect the image of an object on the retina of the eye. These cues involve not only binocular coordination but also motor control (Bushnell & Boudreau, 1993). Kinetic cues are produced by movement of the object or the observer, or both. To find out whether an object is moving, a baby might hold their head still for a moment, an ability that is well established by about 3 months.

**Haptic perception** involves the ability to acquire information by handling objects rather than just looking at them. This includes putting objects in the mouth—a common means of exploration in infancy. The tongue's multiple receptors are capable of fine-grained discrimination and can provide a wealth of information.

Infants appear capable of using haptic information even prenatally. Babies who were born as early as 28 weeks of gestation were able to recognize and remember features of objects that were placed in their hands (Marcus et al., 2012). However, infants are limited by their motor development. It is only after babies develop enough hand-eye coordination to reach for objects and grasp them, generally about 5 to 7 months, that they can use their sense of touch effectively to explore the objects within their reach (Bushnell & Bondreau, 1993).

## THEORIES OF MOTOR DEVELOPMENT

Here, we focus on two theoretical approaches of motor development: the ecological theory of perception and the dynamic systems theory.

**Ecological Theory of Perception** In a classic experiment (Welk & Gibson, 1961), 6-month-old babies were placed on top of a plexiglass tabletop laid over a checkerboard pattern that created the illusion of a vertical drop. From the far side of the table, the infants' mothers then beckoned their children. To the babies, it appeared that their mothers were asking them to crawl over a **visual cliff**—a steep drop down to the floor. Would the infants perceive this illusion of depth? The babies did see a difference between the “ledge” and the “drop.” They crawled freely on the “ledge” but avoided the “drop,” even when they saw their mothers beckoning from the far side of the table.

Experiments such as these were pivotal in the development of the **ecological theory of perception** (Gibson, 1969; Gibson, 1979). In this approach, locomotor development depends on infants' increasing sensitivity to the interaction between their changing physical characteristics and new and varied characteristics of their environment. Babies' bodies continually change with age—their weight, center of gravity, muscular strength, and abilities. And each new environment provides a new challenge for babies to master. For example, sometimes a baby might have to make their way down a slight incline and other times might have to navigate stairs. Instead of relying on solutions that previously worked, with experience, babies learn to continually gauge their abilities and adjust their movements to meet the demands of their current environment.

#### visual cliff

Apparatus designed to give an illusion of depth and used to assess depth perception in infants.

#### ecological theory of perception

Theory developed by Eleanor and James Gibson, which describes developing motor and perceptual abilities as interdependent parts of a functional system that guides behavior in varying contexts.

This process of “learning to learn” is an outcome of both perception and action. It involves visual and manual exploration, testing alternatives, and flexible problem solving. What worked at one time may not work now, and what worked in one environment may not work well in another. For example, when faced with steep downward slopes, infants who have just begun to crawl or walk seem unaware of the limits of their abilities and are more likely to plunge recklessly down steep slopes. Infants who have been crawling for some time are better at judging slopes and know how far they can push their limits without losing their balance. They also explore the slope before attempting it (Adolph, 2008). For example, they may gauge the steepness with their hands first or turn around to go down backward as if they are going down stairs. They have learned how to learn about the slope through their everyday experiences.

This is not a stage approach and thus does not imply that locomotion develops in functionally related, universal stages. Rather, the baby is somewhat like a small scientist testing out new ideas in each situation. According to Gibson, “each problem space has its own set of information-generating behaviors and its own learning curve” (Adolph, 2008, p. 214). So, for example, babies who learn how far they can reach for a toy across a gap while in a sitting position without tumbling over must acquire this knowledge anew for situations involving crawling. Likewise, when crawling babies who have mastered slopes begin to walk, they have to learn to cope with slopes all over again (Adolph & Eppler, 2002).

**Dynamic Systems Theory** Traditionally, motor development was thought to be genetically determined and largely automatic. Today many developmental psychologists consider this view too simplistic. Instead, motor development is considered to be a continuous process of interaction between the baby and the environment.

Esther Thelen, in her influential **dynamic systems theory (DST)**, argued that “behavior emerges in the moment from the self-organization of multiple components” (Spencer et al., 2006, p. 1523). Infant and environment form an interconnected, dynamic system. Opportunities and constraints presented by the infant’s physical characteristics, motivation, energy level, motor strength, and position in the environment at a particular moment in time affect whether and how an infant achieves a goal. Ultimately, a solution emerges as the baby explores various combinations of movements and assembles those that most efficiently contribute to that end. Furthermore, the solution must be flexible and subject to modification in changing circumstances. Rather than being solely in charge of it, the maturing brain is but one component of a dynamic process. Indeed, no one factor determines the pace of development, and no predetermined timetable specifies when a particular skill will emerge. Rather, neurotypical babies tend to develop the same skills in the same order because they are built approximately the same way and have similar challenges and needs. However, because these factors can vary from baby to baby, this approach also allows for variability in the timeline of individual development.

Thelen used the walking reflex to illustrate her approach. When neonates are held upright with their feet touching a surface, they spontaneously make coordinated stepping movements. This behavior usually disappears by the 4th month. These movements do not appear again until late in the 1st year. The usual explanation for the reemerging movement is that the original reflex is replaced by a volitional skill now controlled by the developing brain. But a newborn’s stepping involves the same movements the neonate makes while lying down and kicking. Why would stepping stop, whereas kicking continues? Thelen proposed the answer might be that babies’ legs become thicker and heavier



*As young as this baby peering over the visual cliff is, she can perceive depth and wants to avoid falling off what looks like a cliff.*

Science History Images/Alamy Stock Photo

#### **dynamic systems theory (DST)**

Esther Thelen’s theory, which holds that motor development is a dynamic process of active coordination of multiple systems within the infant in relation to the environment.



*Navajo babies, like this one, are swaddled for most of the day. However, they nonetheless begin to walk at about the same time as unswaddled babies, suggesting a maturational explanation for the emergence of walking in infancy.*

Sue Bennett/Alamy Stock Photo

during the early months, but the muscles are not yet strong enough to carry the increased weight (Thelen, 1995), and so walking attempts disappear. In fact, when infants who had stopped stepping were held in warm water, which helps support their legs, stepping reappeared. Their ability to produce the movement had not changed—only the physical and environmental conditions that inhibited or promoted it.

## ETHNIC AND CULTURAL INFLUENCES ON MOTOR DEVELOPMENT

Examining the influence of culture on motor development provides an excellent opportunity to consider the intersection of nature and nurture. Although motor development generally follows a universal sequence, its pace responds to certain cultural factors.

According to some research, babies of African descent, and to a lesser extent those from India, tend to be more advanced in sitting, walking, and running than White American and European infants (Kelly et al., 2006). Such differences have been found in babies from Uganda, Kenya, Mali, Nigeria, Jamaica, and the Caribbean. In Uganda, for example, babies typically walk at 10 months, as compared with 12 months in the United States and 15 months in France (Mendonça et al., 2016), and infants from Kenya and Cameroon can sit independently longer and more effectively than babies from the United States, Argentina, South Korea, and Italy (Karasik et al., 2015). The origin of these differences is unclear, but it is likely these differences reflect a culture's child-rearing practices (Venetsanou & Kambas, 2010).

This is because infants from different cultures may engage in different levels of activity and may have more or less practice with particular motor skills. As with so many skills, practice makes perfect. In Western countries, motor intervention programs that encourage locomotor skills in young children have been shown to accelerate some forms of motor development, such as head control, reaching, walking, horizontal jumping, or skipping (Lobo & Galloway, 2012; Deli et al., 2006). In some African, Caribbean, and Indian cultures in which infants show advanced motor development, adults use special handling routines, such as bouncing, stepping, and stretching exercises to strengthen babies' muscles. (Hopkins & Westra, 1990; Karasik et al., 2010). And, in many foraging and agrarian societies, including the !Kung and Nso, walking is encouraged in babies. Generally, this is accomplished by bouncing a baby up and down to stimulate the stepping reflex, with the explicit understanding that nonlocomoting babies are more difficult to care for (Lancy, 2015). Not all methods are this benign: Zulu parents sometimes place their toddler on an ant's nest, hoping the stinging bites will motivate the child to crawl or walk (Krige, 1965), and Baka foraging parents poke their slow or recalcitrant toddlers in the buttocks and back of the thighs with prickly seedpods to encourage them not to sit when families are on the move (Higgins, 1985).

In other cultures, features of the caregiving environment may slow down motor development slightly. For instance, some infants raised in northern China were traditionally placed in "sand bags" to toilet them, a practice that, although keeping them clean, constrained and delayed their locomotor development (Karasik et al., 2010). Similarly, Hopi children were sometimes delayed on motor milestones, perhaps as a result of being constricted to a cradleboard, to which they were swaddled for much of their first year (Edwards & Liu, 1995). Children of the Ache in eastern Paraguay, whose mothers pull them back to their laps if they crawl away and who carry them much of the time, do not begin to walk until age 18 to 20 months (Kaplan & Dove, 1987). These types of effects are not limited to traditional cultures. Children who wear diapers and restrictive clothing, an influence more typical of developed countries, show less mature gait patterns, fall more often, and show decreased quality and quantity of stepping (Cole et al., 2012; Groenen et al., 2010). Historical change can also be a factor. The Back to Sleep campaign was effective in reducing the incidence of sudden infant death syndrome but had the unintended consequence of delaying a variety of motor milestones. Because infants were no longer placed on their stomachs to sleep, they were slower to develop the arm and core strength necessary for some milestones (Davis et al., 1998; Karasik et al., 2010).

Some researchers argue because of these early differences, motor development milestones developed within one culture may not be valid when applied to a different cultural context (Mendonça et al., 2016). Other researchers argue that the majority of motor milestones are similar across different countries and cultural groups, and thus the use of normative milestones is warranted (WHO Multicentre Growth Reference Study Group & de Onis, 2006), particularly for younger infants who have had less time to hone specialized skills (Ertem et al., 2018). For now, this remains a debate in the field.



- Trace a typical infant's progress in head control, hand control, and locomotion, according to the Denver norms?
- Discuss how maturation, perception, and cultural influences relate to early motor development?
- Compare the Gibsons' ecological theory of perception and Thelen's dynamic systems theory?

## summary and key terms

### Childbirth, Culture, and Change

- In Europe and the United States, childbirth before the twentieth century was not much different from childbirth in some developing countries today. Birth was a female ritual that occurred at home and was attended by a midwife. Pain relief was minimal, and risks for mother and baby were high.
- The development of the science of obstetrics professionalized childbirth. Births took place in hospitals and were attended by physicians. Medical advances dramatically improved safety.
- Today, delivery at home or in birth centers attended by midwives can be a relatively safe alternative to physician-attended hospital delivery for women with normal, low-risk pregnancies.

### The Birth Process

- Birth normally occurs after a preparatory period of parturition.
- The birth process consists of three stages: (1) dilation of the cervix, (2) descent and emergence of the baby, and (3) expulsion of the umbilical cord and the placenta.
- Electronic fetal monitoring can detect signs of fetal distress, especially in high-risk births.
- About 32 percent of births in the United States are by cesarean delivery.
- Alternative methods of childbirth can minimize the need for painkilling drugs and maximize parents' active involvement.
- Modern epidurals can give effective pain relief with smaller doses of medication than in the past.
- The presence of a doula can provide physical benefits as well as emotional support.

**parturition** (87)

**electronic fetal monitoring** (88)

**cesarean delivery** (89)

**natural childbirth** (89)

**prepared childbirth** (89)

**doula** (90)

## The Newborn Baby

- The neonatal period is a time of transition from intrauterine to extrauterine life.
- At birth, the circulatory, respiratory, digestive, elimination, and temperature regulation systems become independent of the mother's. If a newborn cannot start breathing within about 5 minutes, brain injury may occur.
- Newborns have a strong sucking reflex and secrete meconium from the intestinal tract. They are sometimes subject to neonatal jaundice due to immaturity of the liver.
- At 1 minute and 5 minutes after birth, a neonate's Apgar score can indicate how well they are adjusting to extrauterine life. The Brazelton Neonatal Behavioral Assessment Scale can assess responses to the environment and predict future development.
- Neonatal screening is done for certain rare conditions, such as PKU and congenital hypothyroidism.
- A newborn's state of arousal is governed by periodic cycles of wakefulness, sleep, and activity. Sleep takes up the major, but a diminishing, amount of a neonate's time. By about 6 months, babies do most of their sleeping at night.
- Cultural customs affect sleep patterns.

**neonatal period** (91)

**neonate** (91)

**anoxia** (92)

**neonatal jaundice** (92)

**Apgar scale** (92)

**Brazelton Neonatal Behavioral Assessment Scale (NBAS)**

(92)

**state of arousal** (93)

## Survival and Health

- The vast majority of infant deaths occur in developing countries. Postnatal care can reduce infant mortality.
- Although infant mortality has diminished in the United States, it is still disturbingly high, especially among African American babies. Birth defects are the leading cause of death in infancy, followed by disorders related to prematurity and low birth weight, sudden infant death syndrome (SIDS), maternal complications of pregnancy, and complications of the placenta, umbilical cord, and membranes.
- Sudden infant death syndrome is the leading cause of postneonatal death in the United States. SIDS rates have declined markedly following recommendations to lay babies on their backs to sleep.
- Vaccine-preventable diseases have declined as rates of immunization have improved, but many preschoolers are not fully protected.

**infant mortality rate** (100)

**sudden infant death syndrome (SIDS)** (102)

## Complications of Childbirth

- Complications of childbirth include low birth weight, postmature birth, and stillbirth.
- Low-birth-weight babies may be either preterm (premature) or small-for-gestational-age. Low birth weight is a major factor in infant mortality and can cause long-term physical and cognitive problems. Very-low-birth-weight babies have a less promising prognosis than those who weigh more.

**low-birth-weight babies** (95)

**preterm (premature) infants** (96)

**small-for-date (small-for-gestational-age) infants** (96)

**kangaroo care** (98)

**postmature** (99)

**stillbirth** (99)

## Early Physical Development

- Normal physical growth and sensory and motor development proceed according to the cephalocaudal and proximodistal principles.
- A child's body grows most dramatically during the 1st year of life; growth proceeds at a rapid but diminishing rate throughout the first 3 years.
- Breastfeeding offers many health advantages and sensory and cognitive benefits and, if possible, should be done exclusively for at least the first 6 months.
- The central nervous system controls sensorimotor activity. Lateralization enables each hemisphere of the brain to specialize in different functions.
- The brain grows most rapidly during the months before and immediately after birth as neurons migrate to their assigned locations, form synaptic connections, and undergo integration and differentiation. Cell death and myelination improve the efficiency of the nervous system.
- Reflex behaviors—primitive, locomotor, and postural—are indications of neurological status. Most early reflexes drop out during the 1st year as voluntary, cortical control develops.
- Especially during the early period of rapid growth, environmental experience can influence brain development positively or negatively.
- Sensory capacities, present from birth and even in the womb, develop rapidly in the first months of life. Very young infants show pronounced abilities to discriminate between stimuli.
- Touch is the first sense to develop and mature. Newborns are sensitive to pain. Smell, taste, and hearing also begin to develop in the womb.
- Vision is the least well-developed sense at birth. Peripheral vision, color perception, acuteness of focus, binocular vision, and the ability to follow a moving object with the eyes all develop within the first few months.

**cephalocaudal principle** (105)

**proximodistal principle** (105)

**central nervous system** (109)

**lateralization** (109)

**neurons** (110)

**integration** (111)

**differentiation** (111)

**cell death** (111)

**myelination** (111)

**reflex behavior** (111)

**plasticity** (113)

## Motor Development

- Motor skills develop in a certain sequence, which may depend largely on maturation but also on context, experience, and motivation. Simple skills combine into increasingly complex systems.
- Self-locomotion brings about changes in all domains of development.
- Perception is intimately related to motor development. Depth perception and haptic perception develop in the first half of the 1st year.
- According to the Gibsons' ecological theory, sensory perception and motor activity are coordinated from birth, helping infants figure out how to navigate in their environment.
- Thelen's dynamic systems theory holds that infants develop motor skills not by maturation alone but by active coordination of multiple systems of action within a changing environment.
- Cultural practices may influence the pace of early motor development.

**systems of action** (116)

**Denver Developmental Screening Test** (116)

**gross motor skills** (116)

**fine motor skills** (116)

**depth perception** (118)

**haptic perception** (118)

**visual cliff** (118)

**ecological theory of perception** (118)

**dynamic systems theory (DST)** (119)

## outline

Studying Cognitive Development  
Behaviorist Approach  
Psychometric Approach  
Piagetian Approach  
Information-Processing Approach  
Cognitive Neuroscience Approach  
Social-Contextual Approach  
Language Development

## learning objectives

- Identify six approaches to the study of cognitive development.
- Describe how infants learn and remember.
- Discuss infant assessment measures and the prediction of intelligence.
- Summarize and evaluate Piaget's theory of cognitive development.
- Explain how infants process information and begin to understand the characteristics of the physical world.
- Describe the development of language in infancy.

# Cognitive Development during the First Three Years



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## did you know?

- Brain growth spurts coincide with changes in cognitive behavior.
- Newborns as young as 2 days prefer new sights to familiar sights.
- Children from cultures with tonal versus nontonal languages become sensitive to different types of language sounds.

*In this chapter, we look at infants' and toddlers' cognitive abilities. We use this opportunity to highlight a number of important psychological perspectives, including the behaviorist, psychometric, Piagetian, information-processing, cognitive neuroscientific, and social-contextual views. We also discuss language development and some of the influences that have been identified as important. Last, in all these discussions, we address contextual and cultural issues and discuss their impact.*



**K**nowledge exists potentially in the human soul like the seed in the soil; by learning the potential becomes actual.

—Imam Al-Ghazali (1058–1111)

## Studying Cognitive Development

How do babies learn to solve problems? When does memory develop? What accounts for individual differences in cognitive abilities? Can we predict how smart a baby will be in the future? These questions have long intrigued developmental scientists, many of whom have taken one of six approaches to their study:

- The **behaviorist approach** studies the basic mechanics of learning. Behaviorists are concerned with how behavior changes in response to experience.
- The **psychometric approach** measures quantitative differences in abilities that make up intelligence by using tests that indicate or predict these abilities.
- The **Piagetian approach** looks at changes, or stages, in the quality of cognitive functioning. It is concerned with how the mind structures its activities and adapts to the environment.
- The **information-processing approach** focuses on perception, learning, memory, and problem solving. It aims to discover how children process information from the time they encounter it until they use it.
- The **cognitive neuroscience approach** seeks to identify what brain structures are involved in specific aspects of cognition.
- The **social-contextual approach** examines the effects of environmental aspects of the learning process, particularly the role of parents and other caregivers.

## Behaviorist Approach

Babies are born with the ability to see, hear, smell, taste, and touch, and they have some ability to remember what they learn. Learning theorists are interested in mechanisms of learning. Here we examine both classical and operant conditioning, and then focus on habituation.

### CLASSICAL AND OPERANT CONDITIONING

Eager to capture Ava's memorable moments, her father took pictures of her smiling, crawling, and showing off her other achievements. Whenever the flash went off, Ava blinked. One evening Ava saw her father hold the camera up to his eye—and she blinked *before* the flash. She had learned to associate the camera with the bright light, so that the sight of the camera alone activated her blinking reflex.

Ava's blinking at the sight of the camera is an example of **classical conditioning**, in which a person learns to make a reflex, or involuntary, response (in this case, blinking) to

#### behaviorist approach

Approach to the study of cognitive development that is concerned with basic mechanics of learning.

#### psychometric approach

Approach to the study of cognitive development that seeks to measure intelligence quantitatively.

#### Piagetian approach

Approach to the study of cognitive development that describes qualitative stages in cognitive functioning.

#### information-processing approach

(1) Approach to the study of cognitive development by observing and analyzing the mental processes involved in perceiving and handling information.  
(2) Approach to the study of cognitive development that analyzes processes involved in perceiving and handling information.

#### cognitive neuroscience approach

Approach to the study of cognitive development that links brain processes with cognitive ones.

#### social-contextual approach

Approach to the study of cognitive development that focuses on environmental influences, particularly parents and other caregivers.

#### classical conditioning

Learning based on associating a stimulus that does not ordinarily elicit a response with another stimulus that does elicit the response.



Some children learn to fear dogs via conditioned associations with unpleasant or frightening experiences, such as being bitten. However, those children with prior positive experiences with dogs are less likely to develop such fears.

Light and Vision/Shutterstock

#### operant conditioning

(1) Learning based on association of behavior with its consequences. (2) Learning based on reinforcement or punishment.

Operant conditioning techniques can help us “ask” babies what they remember. Babies 2 to 6 months old who are conditioned to kick to activate a mobile remember this skill even if the mobile is removed for up to 2 weeks. When the mobile is returned, the baby starts kicking as soon as he sees it.

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a stimulus (the camera) that originally did not bring about the response. Classical conditioning enables infants to anticipate an event before it happens. Classically conditioned learning will become extinct, or fade, if it is not reinforced by repeated association. Thus, if Ava frequently saw the camera without the flash, she eventually would stop blinking at the sight of the camera alone.

Whereas classical conditioning focuses on the prediction of events (a flash) based on their associations (a camera), **operant conditioning** focuses on the consequences of behaviors and how they affect the likelihood of that behavior occurring again. Specifically, behaviors may be reinforced and become more likely to occur, or they may be punished and become less likely to occur. For example, a baby may learn that when they babble, their parents respond with smiles and attention, and they may increase this behavior to receive even more smiles and attention. In other words, they have been reinforced for their babbling. By contrast, a baby may see that when they throw their food, their parents tend to frown and speak sharply to them. To avoid this punishment, they might learn not to throw their food.

## RESEARCH APPLICATIONS

Can you remember anything that happened to you before you were about 2 years old? Chances are you can't. Part of the reason is that early procedural knowledge (e.g., how to pound a wooden peg into a hole) and perceptual knowledge (e.g., what an apple tastes like) are not the same as the later explicit, language-based memories used by adults (e.g., what you did last Sunday). Infancy is a time of great change, and retention of those early experiences is not likely to be useful for long.

But how do we determine what babies know? Infants cannot talk, and they have limited motor control; thus, researchers must be creative if they are to determine what babies know and understand. The use of conditioning paradigms in research allow investigators to ask questions of babies in ways they can answer. For example, in one experiment, researchers operantly conditioned 3-month-old infants to kick to activate a mobile attached to one ankle by a ribbon. Babies were trained at this task in the presence of either a coconut or cherry odor, thus classically conditioning the presence of the odor



and the ability to control the mobile with their body movements. Previous research had shown that babies this young forget what they learn 1 week later. However, when the infants were reminded of what they learned about the odor and mobile a day before being tested again, they were able to remember the relationship between their kicking and the mobile's movements. Thus, the babies' responses showed that babies were able to use contextual cues (i.e., the odor) to retrieve memories (Suss et al., 2012). Similar methodology can be used to "ask" babies a wide variety of questions about their perceptual development, memory, learning, and understanding of the world.

## checkpoint can you . . .

- Compare six important approaches to the study of cognitive development and identify their goals?
- Give examples of classical and operant conditioning and discuss how operant conditioning studies can be used to study infants?

### intelligent behavior

Behavior that is goal oriented and adaptive to circumstances and conditions of life.

### IQ (intelligence quotient) tests

Psychometric tests that seek to measure intelligence by comparing a test-taker's performance with standardized norms.



The modern intelligence testing movement began in the early 20th century when schools in Paris asked the psychologist Alfred Binet to devise a way to identify children who could not handle academic work and needed special instruction. Binet believed by identifying and helping such children, their performance would improve.

### Bayley Scales of Infant and Toddler Development

Standardized test of infants' and toddlers' mental and motor development.

## Psychometric Approach

Although there is no clear scientific consensus on a definition of intelligence, most professionals agree on some basic criteria. Intelligence enables people to acquire, remember, and use knowledge; to understand concepts and relationships; and to solve everyday problems. Moreover, **intelligent behavior** is presumed to be goal oriented, meaning it exists for the purposes of attaining a goal. It is also presumed to be adaptive in that it helps an organism adjust to the varying circumstances of life.

The goals of psychometric testing are to measure quantitatively the factors that are thought to make up intelligence (such as comprehension and reasoning) and, from the results of that measurement, to predict future performance (such as school achievement). **IQ (intelligence quotient) tests** consist of questions or tasks that are supposed to show how much of the measured abilities a person has by comparing that person's performance with norms established by a large group of test-takers who were in the standardization sample.

For school-age children, intelligence test scores can predict academic performance fairly accurately and reliably. Testing infants and toddlers is another matter. Because babies cannot tell us what they know and how they think, the most obvious way to gauge their intelligence is by assessing what they can do. But if they do not grasp a rattle, it is hard to tell whether they do not know how, do not feel like doing it, do not realize what is expected of them, or have simply lost interest.

### TESTING INFANTS AND TODDLERS

Although it is virtually impossible to measure infants' intelligence, we can test their functioning with development tests. These tests assess infants' behavior on tasks and compare their performance with norms established on the basis of what large numbers of infants and toddlers can do at particular ages. So, for example, if a child is unable to perform a task that the "average baby" can do by a particular age, that child may be delayed in that area. By contrast, a baby can also be ahead of the curve by performing better than their same-age peers.

The **Bayley Scales of Infant and Toddler Development (Bayley-III)** (Bayley, 2005) is a developmental test designed to assess children from 1 month to 3½ years. Scores on the Bayley-III indicate a child's competencies in each of five developmental areas: cognitive, language, motor, social-emotional, and adaptive behavior. An optional behavior rating scale can be completed by the examiner, in part on the basis of information from the child's caregiver. Separate scores, called developmental quotients (DQs), are calculated for each scale. DQs are most commonly used for early detection of emotional disturbances and sensory, neurological, and environmental deficits, and can help parents and professionals plan for a child's needs.

### ASSESSING THE EARLY HOME ENVIRONMENT

Intelligence was once thought to be fixed at birth, but we now know that it is influenced by both inheritance and experience. What characteristics of the early home environment influence measured intelligence and other measures of cognitive development?

### Home Observation for Measurement of the Environment (HOME)

Instrument to measure the influence of the home environment on children's cognitive growth.

Using the **Home Observation for Measurement of the Environment (HOME)** (Bradley, 1989), trained observers interview the primary caregiver and rate on a yes-or-no checklist the intellectual stimulation and support observed in a child's home. The inventory includes six subscales that measure the number of books and appropriate play materials in the home, the parent's involvement with the child, parental emotional and verbal responsiveness, acceptance of the child's behavior, organization of the environment, and opportunities for daily and varied stimulation.

Overall, HOME scores are significantly correlated with measures of cognitive development (Totsika & Sylva, 2004), and have a stronger influence than the daycare a child attends or the neighborhood they live in (de Souza et al., 2021). For example, home quality for toddlers is associated with language and early literacy skills in preschool (Pinto et al., 2013), and home quality in the first year of preschool predicts numeracy skills in the third year of preschool (Anders et al., 2012). Children's school readiness, verbal ability, and spatial ability scores at 3 and 5 years of age are associated with their home quality scores (Kelly et al., 2011), and when parents change their home behavior as their children prepare to enter school, those children improve in their language development (Son & Morrison, 2010). Other important variables that have been identified with the HOME inventory include the number of books in the home, the presence of playthings that encourage the development of concepts, and parents' involvement in children's play, all of which have been consistently associated with kindergarten achievement scores, language competence, and motor and social development (Bradley et al., 2001). Box 1 lists additional specific items to help babies develop cognitive competence.

The HOME has been used in research across more than 50 countries. Such research has unearthed some common features across different cultures. Overall, items measuring cognitively stimulating aspects of the home environment are more culturally equivalent (i.e., they make more sense within the context of the culture) than are items measuring socioemotional support characteristics of the home environment (Bradley et al., 1996).

#### BOX 1 Fostering Competence

- In the early months, provide sensory stimulation but avoid overstimulation and distracting noises.
- As babies grow older, create an environment that fosters learning—one that includes books, interesting objects, and a place to play.
- Respond to babies' signals. This establishes a sense of trust and gives babies a sense of control over their lives.
- Give babies the power to effect changes. Help a baby discover that turning a doorknob opens a door, flicking a light switch turns on a light, and opening a faucet produces water.
- Give babies freedom to explore. Do not confine them regularly in a crib or jump seat and only for short periods in a playpen.
- Talk to babies; they need interaction with adults.
- In talking to or playing with babies, enter into whatever they are interested in at the moment instead of trying to redirect their attention to something else.
- Arrange opportunities to learn basic skills, such as labeling, comparing, and sorting objects (say, by size or color), putting items in sequence, and observing the consequences of actions.
- Applaud new skills and help babies practice and expand them. Stay nearby but do not hover.
- Read to babies in a warm, caring atmosphere from an early age. Reading aloud and talking about the stories develops preliteracy skills.
- Use punishment sparingly. Do not punish or ridicule results of normal trial-and-error exploration.

Sources: Bradley & Caldwell (1982); Bradley, Caldwell, & Rock (1988); Bradley et al. (1989); Ramey & Ramey (1998); Ramey & Ramey (1992); Staso, quoted in Blakeslee (1997); Stevens & Bakeman (1985); White (1971); White et al. (1979).

Additionally, socioeconomic status and HOME scores tend to be correlated across most cultures. HOME scores are also correlated with cognitive function, language ability, and academic achievement. Last, stimulation and parental responsiveness are important predictive variables (Fernald et al., 2017).

Still, some HOME items are less culturally relevant in non-Western families than in Western families (Bradley et al., 2001), and the scale has been frequently modified so as to more appropriately capture positive developmental influences across cultures and to avoid viewing cultural differences as deficiencies. For example, although encouraging exploration of the environment is generally a positive variable, an intervention program targeting severely malnourished Bangladeshi children modified the HOME to include items focused on parental limit setting, a necessary feature for this population, given the poverty and physical danger to which the children were exposed (Nahar et al., 2012). As another example, the use of physical punishment as a socialization tool varies across cultures. Countries such as Sweden and the Netherlands tend to use it infrequently, whereas it is common in countries such as Taiwan, Tanzania, and South Africa (Straus, 2010), and anthropological research suggests corporal punishment is typical in about 40 percent of preindustrial cultures (Ember & Ember, 2005). Thus, items focused on physical punishment must be modified to reflect cultural values and may not carry the same negative weight as they do in countries such as the United States.



*The HOME may need to be modified to appropriately identify developmental influences in cultures different from the one in which it was constructed. For example, parental limit setting is generally a negative influence in Western cultures but is a necessary feature in poor Bangladeshi families.*

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## EARLY INTERVENTION

**Early intervention** is a systematic process of planning and providing therapeutic and educational services for families that need help in meeting infants', toddlers', and preschool children's developmental needs. Such programs are expensive, and assessment research is typically required to justify continued funding. A large number of research programs have sought to determine the effectiveness of intervention programs. For example, Project CARE (Wasik et al., 1990), the Abecedarian (ABC) Project (Ramey, 2018), and Head Start (Lee et al., 2014) have been extensively investigated.

Generally, these programs involve full-day, year-round early childhood education from infancy through the preschool years as well as family-oriented social services, early childhood education, medical care and services, and family education on child development. Control groups vary but may, for example, consist of children who receive pediatric or social work services but do not participate in day care (Ramey & Ramey, 2003) or children who are cared for at home by parents or attend center-based day care (Lee et al., 2014; Zhai, Brooks-Gunn, & Waldfogel, 2014).

The typical pattern of findings for early intervention programs involves an advantage for children who participated in them over children in control groups. Generally, participants show positive outcomes on cognitive developmental outcomes, including reading and math scores, IQ, and school progress (Lee et al., 2014; Ramey, 2018; Camilli et al., 2010). However, the strength of this advantage varies depending on the comparison group. When participants are compared to children who did not attend any form of preschool or day care, they tend to show impressive advantages. However, when they are compared to children who attended some form of early childhood education, such as a center-based day care, then the gains shown by children who participated in early

### early intervention

Systematic process of providing services to help families meet young children's developmental needs.

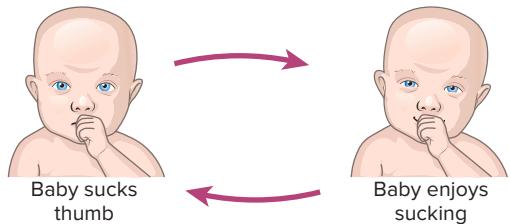


*Studies have shown that early educational intervention can help offset environmental risks.*

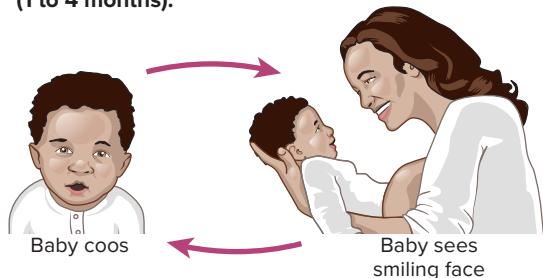
Glow Images

## checkpoint can you ...

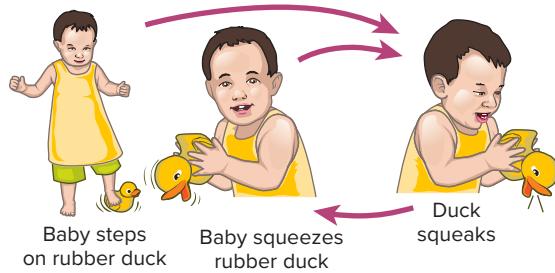
- Tell why developmental tests are sometimes given to infants and toddlers?
- Identify aspects of the early home environment that may influence cognitive development?
- Discuss the value of early intervention?



(a) Primary circular reaction: Action and response both involve infant's own body (1 to 4 months).



(b) Secondary circular reaction: Action gets a response from another person or object, leading to baby's repeating original action (4 to 8 months).



(c) Tertiary circular reaction: Action gets one pleasing result, leading baby to perform similar actions to get similar results (12 to 18 months).

**FIGURE 1**

Primary, Secondary, and Tertiary Circular Reactions

intervention programs are not as compelling (Shager et al., 2013; Lee et al., 2014). Moreover, the gains are strongest initially and fade over time (Lee et al., 1990).

However, long-term follow-up studies have found that despite the initial fall-off in gains, there are lasting effects of early intervention programs. Children who participate in early intervention programs are less likely to require special education services in grade school and high school, more likely to graduate from high school, more likely to be employed, less likely to be incarcerated, and report higher lifetime earnings (McCoy et al., 2017; Melhuish et al., 2015). Thus, from an economic standpoint, despite their high cost, early intervention programs are worth the benefits accrued (Ramey, 2018).

## Piagetian Approach

The first of Piaget's four stages of cognitive development is the **sensorimotor stage**. During this stage (birth to approximately age 2), infants learn about themselves and their world through their developing sensory and motor activity. Babies change from creatures who respond primarily through reflexes and random behavior into goal-oriented toddlers.

### SUBSTAGES OF THE SENSORIMOTOR STAGE

The sensorimotor stage consists of six substages that flow from one to another as a baby's **schemes**, organized patterns of thought and behavior, become more elaborate. During the first five substages, babies learn to coordinate input from their senses and organize their activities in relation to their environment. During the sixth substage, they progress to using symbols and concepts to solve simple problems.

Much of this early cognitive growth comes about through **circular reactions**, in which an infant learns to reproduce events originally discovered by chance. Initially, an activity such as sucking produces an enjoyable sensation that the baby wants to repeat. The repetition again produces pleasure, which motivates the baby to do it yet again (Figure 1). The originally chance behavior has been consolidated into a new scheme.

**Substage 1: Use of Reflexes.** In the first substage (birth to about 1 month), neonates practice their reflexes. For example, newborns suck reflexively when their lips are touched. But they soon learn to find the nipple even when they are not touched, and they suck at times when they are not hungry. Infants thus modify and extend the scheme for sucking. However, they do not coordinate information from their senses, for example, by grasping an object they are looking at.

**Substage 2: Primary Circular Reactions.** In the second substage (about 1 to 4 months), babies learn to purposely repeat a pleasurable bodily sensation first achieved by chance (Figure 1a). These activities focus on the body rather than the external environment. Piaget called this a primary circular reaction. Also, they begin to turn toward sounds, showing the ability to coordinate different kinds of sensory information (vision and hearing).

**Substage 3: Secondary Circular Reactions.** The third substage (about 4 to 8 months) coincides with a new interest in manipulating objects and learning about their properties (Figure 1b). Babies also intentionally repeat an action not merely for its own sake, as in the second substage, but to get rewarding results beyond the infant's own body. These are known as secondary circular reactions. For example, a baby this age might repeatedly shake a rattle to hear the noise or coo when a friendly face appears so that it stays longer. Their actions are intentional but not goal-directed.

**Substage 4: Coordination of Secondary Schemes.** By the time infants reach the fourth substage (about 8 to 12 months), coordination of secondary schemes, they have built upon the few schemes they were born with. Their behavior is more intentional and purposeful, and they can anticipate events. They have learned to generalize from past experiences to solve new problems. They will crawl to get something they want, grab it, or push away a barrier to it. **They try out, modify, and coordinate previous schemes to find one that works.** This substage marks the development of complex, goal-directed behavior.

**Substage 5: Tertiary Circular Reactions.** In the fifth substage (about 12 to 18 months), babies begin to experiment to see what will happen (Figure 1c). They now vary a behavior to see what might happen in tertiary circular reactions. For example, a toddler may squeeze a rubber duck, then step on it, then throw it in order to see if all three actions result in squeaks. By trial and error, toddlers try behaviors until they find the best way to attain a goal.

**Substage 6: Mental Combinations.** The sixth substage (about 18 months to 2 years) is a transition to the preoperational stage of early childhood. **Representational ability**—the ability to mentally represent objects and actions in memory, largely through symbols such as words, numbers, and mental pictures—frees toddlers from immediate experience. They can pretend, and their representational ability affects the sophistication of their pretending. They can think about actions before taking them and try out solutions in their mind. They no longer have to go through laborious trial and error in the real world to picture the difference between what might happen when food is thrown, shoved, or dropped from different heights off the side of their high chair.

During these six substages, infants develop the abilities to think and remember. They also develop knowledge about aspects of the physical world, such as objects and spatial relationships. Researchers inspired by Piaget have found that some of these developments conform fairly closely to his observations, but other developments, including representational ability, may occur earlier than Piaget claimed. (Table 1 compares Piaget's views on these and other topics with more current findings.)

#### sensorimotor stage

Piaget's first stage in cognitive development, in which infants learn through senses and motor activity.

#### schemes

Piaget's term for organized patterns of thought and behavior used in particular situations.

#### circular reactions

Piaget's term for processes by which an infant learns to reproduce desired occurrences originally discovered by chance.

#### representational ability

Piaget's term for capacity to store mental images or symbols of objects and events.

### checkpoint can you . . .

- Summarize major developments during the six substages of the sensorimotor stage?
- Explain how primary, secondary, and tertiary circular reactions work?
- Tell why the development of representational ability is important?

**TABLE 1** Key Developments of the Sensorimotor Stage

Concept or Skill	Piaget's View	More Recent Findings
<b>Imitation</b>	Invisible imitation develops around 9 months; deferred imitation begins after development of mental representations in the sixth substage (18–24 months).	Controversial studies have found invisible imitation of facial expressions in newborns and deferred imitation as early as 6 weeks. Deferred imitation of complex activities seems to exist as early as 6 months.
<b>Object permanence</b>	Develops gradually between the third and sixth substage	Infants as young as 3½ months (second substage) seem to show object knowledge through their looking behavior.
<b>Symbolic development</b>	Depends on representational thinking, which develops in the sixth substage (18–24 months)	Understanding that pictures stand for something else occurs at about 19 months. Children under 3 tend to have difficulty interpreting scale models.
<b>Categorization</b>	Depends on representational thinking, which develops during the sixth substage (18–24 months)	Infants as young as 3 months seem to recognize perceptual categories; by the end of the first year, they can categorize by function.
<b>Causality</b>	Develops slowly between 4–6 months and 1 year, based on an infant's discovery, first of effects of own actions, and then of effects of outside forces	Some evidence suggests early awareness of specific causal events in the physical world, but general understanding of causality may be slower to develop.
<b>Number</b>	Depends on use of symbols, which begins in the sixth substage (18–24 months)	Infants as young as 5 months may recognize and mentally manipulate small numbers, but interpretation of findings is in dispute.

## OBJECT CONCEPT

In his close observations of children, Piaget noted that infants under the age of about 8 months act as if an object no longer exists once it is out of their line of sight. This led to his theorizing about the object concept: the understanding that objects have independent existence, characteristics, and locations in space.

### object permanence

Piaget's term for the understanding that a person or object still exists when out of sight.

One aspect of the object concept is **object permanence**, the realization that something continues to exist when out of sight. At first, infants appear to have no such concept. If you hide an interesting toy, babies will not show any obvious sign they understand it still exists. However, by 18 to 24 months, almost all babies appear to understand that objects have independent existences and will reliably search for hidden objects. According to Piaget, object permanence develops gradually during the sensorimotor stage as children develop the ability to symbolically represent objects.

But was Piaget correct? Some research suggests that babies may fail to physically search for hidden objects not because they lack the understanding but because they cannot yet carry out a two-step sequence of actions, such as lifting the cover of a box and then grasping the object. Methods based only on infants' looking behavior eliminate the need for coordination with motor activity and thus can be used at very early ages. With this technique, we can get a better assessment of what babies really know.

Over the next few months, this ability continues to develop. For example, infants will continue to look for an object in the place where they first found it after seeing it hidden, even if they were later shown the object being moved to a new location (the A-not-B error). Somewhere between 5 and 8 months, they start looking at the correct location where the object was moved but do not reach for it. At about 9 to 10 months, infants will start looking and reaching for the object in the correct location (Cuevas & Bell, 2010). At 12 to 18 months, most infants will reliably search for an object in the last place they saw it hidden. However, they will not search for it in a place where they did not see it hidden. At 18 to 24 months, object permanence is fully achieved; toddlers will look for an object even if they did not see it hidden.

Infants' growing understanding that objects can be hidden and reappear may be why games like peekaboo are common across many cultural groups. Three-month-old infants enjoy their mothers' looming faces. At 5 to 7 months, they show anticipatory looking and smiling in the direction where they expect their play partner to appear and are particularly delighted by reemergences that surprise them. Note that this demonstrates that they continue to be aware of the existence of their play partner, even when not in sight. By about a year of age, infants take an increasingly active role in the game, initiating play by covering their eyes or putting a cloth over their face. Peekaboo-type games have been documented in a wide variety of cultures, including Germany, Brazil, Greece, India, South Africa, Japan, Korea, Italy, the Netherlands, Iran, and Indonesia, and among immigrant groups in the United States (Fernald & O'Neill, 1993; Millar, 1988).



This little girl seems to be showing some concept of object permanence by searching for an object that is partially hidden.

Doug Goodman/Science Source

## IMITATION

One-year-old Clara watches as her older sister brushes her hair. When her sister puts the brush down, Clara picks it up and tries to brush her own hair.

Imitation becomes increasingly valuable late in the first year of life as babies try new skills. It is an intensely social process that helps babies learn new skills. Piaget noted imitation in his own observations and maintained that visible imitation—imitation that uses body parts such as hands or feet that babies can see—develops first and is then followed by invisible imitation—imitation that involves parts of the body that babies cannot see—at 9 months.

Whether or not newborns can imitate is a controversial subject. Initially, studies seemed to indicate that newborns could imitate adults by opening their mouths and sticking out their tongues (Meltzoff &

Moore, 1989). More recent longitudinal research concluded that under more carefully controlled testing conditions, the apparent imitation disappeared (Oostenbroek et al., 2018). However, this finding remains in dispute (Meltzoff et al., 2018).

Piaget believed that children under 18 months could not engage in **deferred imitation**, a more complex ability requiring long-term memory. Deferred imitation is the reproduction of an observed behavior after the passage of time. As the behavior is no longer happening, deferred imitation requires that a stored representation of the action be recalled. Piaget argued that young children could not engage in deferred imitation because they lacked the ability to retain mental representations.

However, deferred imitation of novel or complex events seems to begin earlier than Piaget thought. For example, in one study, 6-month-old German and Cameroonian infants were able to imitate how an adult interacted with a doll after a 10-minute delay (Goertz et al., 2011). The ability to hold material in memory over a longer time span increases with age, as does the ability to remember a sequence of steps in order. For example, at 6 months, most infants can remember a sequence of two steps, such as dropping a toy car down a chute and then pushing it with a rod to make it roll down a ramp, but only for about a day. At 9 months, they can remember the sequence for a month. By the time infants are 20 months old, they can remember the sequence for up to a year (Bauer et al., 2010).

By 14 months of age, toddlers show preferences about whom they imitate from and what they imitate. For example, they are more likely to imitate from people who speak the same language they do (Buttelmann et al., 2013). At 15 months, they show a bias toward imitating older models, such as an older sibling or an adult, over peers, such as a child their same age. At 2 to 3 years, children will imitate both peers and adults but will imitate the adults more carefully even when their actions seem irrelevant to the task (Wood et al., 2013). At 4 years of age, they are more likely to imitate those who are the same gender they are (Grace et al., 2008) or who are familiar or known to them (Wood et al., 2013). Additionally, toddlers are also more likely to imitate conventional actions (e.g., cuddling a teddy bear) than unconventional actions (e.g., cuddling a photograph of a teddy bear) (Callaghan, 2020).

Theorists argue children's imitation depends on their goals. When children are trying to communicate similarity or forge social bonds, they are more likely to imitate others who are like them, such as other children. When children are trying to learn new things, they are likely to imitate those whom they think they can learn the most from, such as adults (Zmyj & Seehagen, 2013). Moreover, children are predisposed to "overimitation." Children tend to copy any action performed by an adult, even if that action is clearly purposeless or inefficient, and this tendency has been extensively documented in cross-cultural research (Hoehl et al., 2019). Overimitation has been viewed by many theorists as an underlying support framework for the rapid and extensive cultural learning exhibited in humans.

## SYMBOLIC DEVELOPMENT

Much of the knowledge people acquire about their world is gained through symbols, intentional representations of reality. One aspect of symbolic development is the growth of pictorial competence, the ability to understand the nature of pictures (DeLoache et al., 2003). For example, consider how suns are represented in children's books. Generally, they are drawn as yellow circles with radiating spires. A child who understands that this graphic stands in for the ball of light in the sky has attained some degree of pictorial competence.

There are indications that even very young children can understand some aspects of pictorial representations. Infants as young as 4 months of age stare longer at "impossible objects" (such as a picture of a cube that would defy the rules of geometry), suggesting that even at this age, they have some ability to mentally represent three-dimensional objects (Krause et al., 2019). Still, this understanding is incomplete. For instance, although infants from about 7 to 12 months of age look longer at familiar objects that

### deferred imitation

Piaget's term for reproduction of an observed behavior after the passage of time by calling up a stored symbol of it.

are smaller or larger than they should be, children show no preferences for those same oddly sized objects when they are presented in pictures. This suggests they are unable to apply real-world knowledge to a symbolic representation (Sensoy et al., 2020). Moreover, until about 15 months, infants use their hands to explore pictures as if they were objects—rubbing, patting, or attempting to lift a depicted object off the page. This suggests they do not understand it is a representation. However, by about 19 months, children are able to point at a picture of an object while saying its name, clearly demonstrating their understanding that a picture is a symbol of something else (DeLoache et al., 2003). And by age 2, children understand that a picture is both an object and a symbol (Priessler & Bloom, 2007). As children's ability to recognize and understand visual features in pictures improves, so too does their ability to draw those same features (Long et al., 2021).

Picture books support children's acquisition of information about the world. However, research suggests that the ability to learn from books is influenced by cultural experiences. Twenty-month-old Tanzanian children who had previously not had experience with books were able to recognize familiar objects in books presented to them by a researcher but were not able to learn a label for a novel object (a gold S-shaped hook) first presented to them in a book and then in real life. By approximately 27 months, they were able to learn the word for the novel object from a picture book and apply it to the real object correctly, and by 34 months, they were able to apply what they learned to a different exemplar of that novel object (a silver S-shaped hook) (Walker et al., 2013). Similarly, 4-year-old children in Peru, India, and Canada were all able to correctly answer where a person would look for favored toys when the toys' location was changed while they were out of the room. However, when the same task utilized pictures rather than real toy boxes and toys, children from Peru and India had more difficulty with the task. Presumably, this was due to Canadian children's greater experience with storybooks (Callaghan et al., 2012).

Tablet computers and cell phones offer an interesting contrast in that objects on the screen are two-dimensional, like photographs, but can be manipulated like real objects. For example, by using two fingers in a pinch-and-spread move, viewers can shrink and magnify objects on the screen. Young children rapidly become adept at interacting with content on electronic devices. In one study of more than 450 toddlers, 68 percent could flick their finger to turn a page on an electronic book, 41 percent could press and drag objects around the screen, and 71 percent were adept at using a tap (Cristia & Seidl, 2015). However, despite their facility with electronics, young children still treat content on a screen more like a photograph than a real object (Ziemer & Snyder, 2016) and are limited in what they can learn. For example, when 2- to 3-year-old children are shown how to solve a puzzle on a touchscreen, they have difficulty transferring this information to a real puzzle board with actual puzzle pieces (Moser et al., 2015). In another study, children under the age of 2 years did not learn the word for a novel object presented via an e-book, although they easily learned the word presented in a traditional print book (Strouse & Ganea, 2017). When adults scaffold children's growing symbolic understanding, they are able to perform at higher levels. Two-year-old children in one study were unable to use a previously taken photo on a smartphone to locate a hidden toy. However, when the researcher, in real time, appeared to take and use a smartphone digital photo, children were significantly more successful at finding the hidden toy (Russo Johnson et al., 2021).

What about television? Overall, children learn less from video than live presentation, although the difference in learning between video and live presentation of information (known as the video deficit) grows increasingly smaller as children age (Strouse & Samson, 2020). Although toddlers may spend a good deal of time watching television, at first they seem unaware that what they are seeing is a representation of reality (Troseth et al., 2006) and may struggle to extract usable information from it. For example, 12- to 18-month-old children were better able to imitate an adult's actions (helping a puppet ring a bell) when they saw an adult performing

Although picture books are common across cultures, they vary in content. For instance, Japanese picture books for infants and toddlers contain fewer objects and are less visually crowded than American picture books (Kuwabara et al., 2020).



While children can learn words for novel objects from print books easily by the age of 2, they cannot use e-books in this way until after 2 years of age.  
amphoto/Moment/Getty Images

the action in front of them than when they saw a video of the same thing (Barr et al., 2007). In another series of experiments, 2½-year-olds were able to locate an object hidden in an adjoining room after watching a video of an adult hiding it, but 2-year-olds could not. Yet the younger children were able to find the object if they watched through a window as it was hidden (Troseth & DeLoache, 1998). Apparently, what the 2-year-olds lacked was representational understanding of screen images.

Fortunately, especially in the time of COVID-19 and social distancing, children do benefit from video calls and electronic media that is sufficiently interactive. When adults are able to establish high-quality joint attention processes in a video call, children do learn from such interactions (McClure et al., 2018), and there are indications that even babies as young as 6 months can interact effectively with a parent on video (McClure et al., 2020). Young children understand and learn best from video calls when they view the call with others, especially when those others are responsive to what is happening onscreen (Myers et al., 2018). Although more research is needed, technologies such as these show promise as a means by which to establish and maintain connections between family members who cannot be physically present.

Have you ever seen toddlers try to put on a hat that is too small for their head or sit in a chair much too tiny to hold them? This is known as a scale error—a momentary misperception of the relative sizes of objects (DeLoache et al., 2013). In one study, 18- to 36-month-olds were first allowed to interact with play objects that fit their body size, such as a toy car to ride in or a plastic slide to slide down. Then the life-size objects were replaced with miniature replicas. The children tried to slide down the tiny slides and squeeze their bodies into the miniature cars. Why would they still treat the objects as if they were full size?

The researchers suggested that these actions might in part be based on a lack of impulse control: The children wanted to play with the objects so badly that they ignored perceptual information about size. However, toddlers might also be exhibiting faulty communication between immature brain systems. One brain system enables the child to recognize and categorize an object (“That’s a chair”) and to plan what to do with it (“I’m going to sit in it”). A separate system may be involved in perceiving the size of the object and using visual information to control actions pertaining to it (“It’s big enough to sit in”). When communication between these areas breaks down, children momentarily, and amusingly, treat the objects as if they were full size (DeLoache et al., 2004).

The **dual representation hypothesis** offers yet another proposed explanation for scale errors. An object such as a toy chair has two potential representations. The chair is both an object in its own right, as well as a symbol for a class of things (“chairs”). According to this hypothesis, it is difficult for toddlers to simultaneously mentally represent both the actual object and the symbolic nature of what it stands for. In other words, they can either focus on the particular chair they are faced with (“This is a miniature chair”) or the symbol and what it represents (“Chairs are for sitting in”), and so they may confuse the two (DeLoache, 2011).

#### **dual representation hypothesis**

Proposal that children under age 3 have difficulty grasping spatial relationships because of the need to keep more than one mental representation in mind at the same time.

Culture and experience may affect this process. For example, adults from Western cultures tend to process visual information in an analytical fashion, focusing on individual objects, whereas adults from Eastern cultures process visual information more holistically, paying greater attention to the relationships between objects (Buchtel & Norenzayan, 2009). This differential focus affects the propensity of children to experience scale error. In one study, 18- to 24-month-old children from the United Kingdom were significantly more likely to make scale errors than were Japanese children, presumably due to the Japanese toddlers’ greater attention to and practice with integrating information in a global fashion (Ishibashi et al., 2021).

## EVALUATING PIAGET’S SENSORIMOTOR STAGE

According to Piaget, the journey from reflex behavior to the beginnings of thought is a long, slow one. For a year and a half or so, babies learn only from their senses and movements; not until the last half of the 2nd year do they make the breakthrough to conceptual thought. However, research using simplified tasks and modern tools suggests

## checkpoint can you ...

- Explain why Piaget may have underestimated some of infants' cognitive abilities?
- Discuss the implications of more recent research?

that limitations Piaget saw in infants' early cognitive abilities, such as object permanence, may instead have reflected immature linguistic and motor skills. The answers that Piaget received were as much a function of the ways in which he asked the questions as they were a reflection of the actual abilities of young children.

In terms of describing what children do under certain circumstances and the basic progression of skills, Piaget was correct. However, infants and toddlers are more cognitively competent than Piaget imagined. This does not mean that infants come into the world with minds fully formed. As Piaget observed, immature forms of cognition precede more mature forms. However, Piaget may have been mistaken in his emphasis on motor experience as the primary engine of cognitive growth. Infants' perceptions are far ahead of their motor abilities, and today's methods enable researchers to make observations and inferences about those perceptions, as we discuss it in the Information-Processing Approach section.

# Information-Processing Approach

Information-processing researchers analyze the separate parts of a complex task to figure out what abilities are necessary for each part of the task and at what age these abilities develop. Information-processing researchers also measure, and draw inferences from, what infants pay attention to and for how long.

## HABITUATION

At about 6 weeks, Stefan lies peacefully in his crib near a window, sucking a pacifier. It is a cloudy day, but suddenly the sun breaks through, and an angular shaft of light appears on the end of the crib. Stefan stops sucking for a few moments, staring at the pattern of light and shade. Then he looks away and starts sucking again.

When doing research with babies, researchers need to figure out how to ask questions in ways that babies can answer. We don't know what was going on in Stefan's mind when he saw the shaft of light, but we can tell by his sucking and looking behavior at what point he began paying attention and when he stopped. Natural behaviors such as those performed by Stefan give researchers a means by which to do this. **Habituation** is a type of learning in which repeated or continuous exposure to a stimulus (such as a shaft of light) reduces attention to that stimulus (such as looking away). It can be compared to boredom, and the rate of habituation (how quickly infants look away) can be used to ask infants how interesting they think various objects are.

### habituation

Type of learning in which familiarity with a stimulus reduces, slows, or stops a response.

*Research using the habituation paradigm has shown babies prefer Picasso to Monet (Cacchione et al., 2011) and softer, rounder dad bods to more muscular male shapes (Heron-Delaney et al., 2013).*

### dishabituation

Increase in responsiveness after presentation of a new stimulus.

Researchers study habituation in newborns by repeatedly presenting a stimulus such as a sound or visual pattern and then monitoring responses such as heart rate, sucking, eye movements, and brain activity. A baby who has been sucking typically stops or sucks less vigorously when a stimulus is first presented in order to pay attention to the stimulus. After the stimulus loses its novelty, the infant generally resumes sucking vigorously. This indicates that habituation has occurred. If a new sight or sound is presented, the baby's attention is generally captured once again, and the baby will reorient toward the interesting stimulus and once again sucking slows. This response to a new stimulus is called **dishabituation**.

Researchers gauge the efficiency of infants' information processing by measuring how quickly babies habituate to familiar stimuli, how fast their attention recovers when they are exposed to new stimuli, and how much time they spend looking at the new and the old. Liking to look at new things and habituating to them quickly correlates with later signs of cognitive development, such as a preference for complexity, rapid exploration of the environment, sophisticated play, quick problem solving, and the ability to match pictures. In fact, as we will see, speed of habituation and other information-processing abilities show promise as predictors of intelligence (Rose et al., 2012).

## TOOLS OF INFANT RESEARCH

The tendency to spend more time looking at one sight rather than another is known as **visual preference**. Researchers can use this natural tendency to ask babies which of two objects they prefer. For example, if babies given a choice between looking at a curved or straight line spend more time focused on the curved line, the implication is that babies like curved lines more than straight lines. With this technique, researchers have determined that babies less than 2 days old prefer curved lines to straight lines, complex patterns to simple patterns, three-dimensional objects to two-dimensional objects, pictures of faces or facelike configurations, and moving objects to stationary objects. Last, infants prefer new sights to familiar ones (Rakison, 2005; Turati et al., 2002), which is known as novelty preference.

The finding that babies like to look at new things afforded researchers with yet another tool with which to ask them questions. Babies can be shown a stimulus and be allowed to habituate to it. Then they can be concurrently presented with the familiar stimulus, as well as an additional novel stimulus, and their visual preference can be measured. If the baby spends longer looking at the novel stimulus, that suggests that the baby recognizes the familiar stimulus. In other words, because the novel stimulus is new and babies like new things, it is more interesting and thus warrants a better look than the previously seen, more boring, stimulus. This behavior demonstrates **visual recognition memory**, an ability that depends on the capacity to form and refer to mental representations.

## PERCEPTUAL AND ATTENTIONAL PROCESSES

Speed of processing is generally assessed by how quickly infants habituate to a new stimulus and how well they remember previously encountered stimuli. From birth to about 2 months, the amount of time infants typically gaze at a new sight increases (Colombo, 2002). Between about 4 to 8 months, looking time shortens, with the fastest decline seen at 4 to 6 months (Colombo et al., 2010). Presumably, this is because infants learn to scan objects more efficiently and thus shift attention more rapidly. Indeed, those infants who look for less time at novel stimuli show better memory for it later (Reynolds et al., 2011) and have better executive control in early childhood (Cuevas & Bell, 2010). Later in the 1st year and into the 2nd, when sustaining attention becomes more voluntary and task-oriented, looking time plateaus or increases, especially for more complex stimuli (Colombo et al., 2004; Bornstein & Colombo, 2012).

Auditory discrimination studies are also usually based on attentional preference. This ability may emerge prenatally. In one study, fetuses were played recordings of various adults reading a story in either their parents' native language or a novel language. Heart rate data indicated the fetuses paid increased attention to both their mother's voice and stories read in a novel language (Kisilevsky et al., 2009). Newborn infants also have the ability to remember some sounds. Infants who heard a certain speech sound one day after birth remembered that sound 24 hours later, as shown by a reduced tendency to turn their heads toward the sound (Swain et al., 1993). Brain imaging research mirrors that finding, as right frontal regions of the brain active in adults during word recognition tasks are similarly activated in infants, particularly for vowel sounds (Benavides-Varela et al., 2012). However, these memory traces, at least initially, are brief and subject to interference and forgetting (Benavides-Varela et al., 2011).

The capacity for **joint attention**—which is of fundamental importance to social interaction, language acquisition, and the understanding of others' intentions and mental states—develops between 10 and 12 months, when babies follow an adults' gaze by looking or pointing in the same direction (Behne et al., 2012). Young children who follow an adults' gaze at 10 to 11 months have a larger vocabulary at 18 months, 2 years, and 2½ years than those who do not (Brooks & Meltzoff, 2005; 2008; 2015). Also, the use of pointing by children to capture the attention of adults around them has strong positive effects on children's language comprehension and production (Collonnesi et al., 2010).

### visual preference

Tendency of infants to spend more time looking at one sight than another.

### visual recognition memory

Ability to distinguish a familiar visual stimulus from an unfamiliar one when shown both at the same time.

### joint attention

A shared attentional focus, typically initiated with eye gaze or pointing.

Watching television may impede attentional development, although the relationship is complex. Some research has shown an association between television viewing—particularly that in which the television is habitually left on—and later problems with attention and aggression (Martin et al., 2012). Other research suggests this relationship does not exist (Stevens & Mulsow, 2006) or is only true for those children who watch more than 7 hours of television a day, and even that association disappears when maternal achievement and family income are included in analyses (Foster & Watkins, 2010). It may be that television viewing does not cause attentional problems per se, but rather that children with attentional problems are more drawn to television. Moreover, the influence of television on children's development is affected by the child's individual characteristics and the family and social context. For instance, viewing high-quality educational programming is associated with improvements in academic skills, especially for those children most at risk. However, at the same time, play in infancy—a vitally important driver of development—is negatively affected by television. When play is disrupted because of television, children are more inattentive and hyperactive, have less effective executive functioning, and are more likely to have a language delay (Kostyrka-Allchorne et al., 2017).

## CROSS-MODAL TRANSFER

Piaget held that the senses are unconnected at birth and are only gradually integrated through experience. However, this integration begins almost immediately. The fact that neonates will look at a source of sound shows that at the very least they associate hearing and sight. A more sophisticated ability is **cross-modal transfer**, the ability to use information gained from one sense to guide another—as when a person negotiates a dark room by feeling for the location of familiar objects.

Cross-modal transfer of some, but not all, modalities appears to be available almost from birth. For example, in one study, newborns were able to visually recognize a cylinder or a prism they had previously held but could not use tactile (touch) information to recognize a shape they had previously seen. However, they were able to use textured objects bidirectionally. In other words, if the objects used as stimulus were either smooth or nubby, the infants could transfer vision to touch and touch to vision equally well (Sann & Streri, 2007). Similarly, 1-month-olds can transfer information gained from sucking (touch) to vision (Gibson & Walker, 1984), and 2- to 8-month-old infants expect bouncing objects and their sounds to be synchronous (Lewkowicz, 1996).

The ability to utilize information across multiple senses is fundamental to cognitive development. For example, it is believed to be important for language acquisition (Robinson & Sloutsky, 2010). This is because for most nouns, the sound of a word must be mapped to visual information, such as when the word *dog* is associated with the referent animal.

### checkpoint can you . . .

- Summarize the information-processing approach to the study of cognitive development?
- Explain how habituation measures the efficiency of infants' information processing?
- Identify several early perceptual and processing abilities that serve as predictors of intelligence?

## INFORMATION PROCESSING AS A PREDICTOR OF INTELLIGENCE

Because of weak correlations between infants' scores on developmental tests such as the Bayley scales and their later IQ (Bjorklund & Causey, 2017), many psychologists assumed that the cognitive functioning of infants had little in common with that of older children and adults. However, there are individual differences in the speed with which infants form and refer to mental images, some aspects of which appear to have continuity with later cognitive functioning. For example, when shown two sights at the same time, infants who quickly shift attention from one to another tend to have better recognition memory and stronger novelty preference than infants who take longer looks at a single sight (Jankowski et al., 2001). As toddlers, such infants are also better at tasks utilizing executive functioning, such as playing Simon says or holding a goldfish cracker on their tongues without eating it (Kraybill et al., 2019). Executive functioning, in turn, is then associated with reading achievement (Blankenship et al., 2019).

Four core cognitive domains appear to be associated with later IQ: attention, processing speed, memory, and representational competence (as indexed by cross-modal transfer

and the ability to anticipate future events). In one study, performance on these tasks in infancy (7 and 12 months) was related to performance on the same tasks in toddlerhood (24 and 36 months) as well as to performance on IQ tests at 11 years of age (Rose et al., 2012). Similar relationships to school performance have been found for the ability to shift attention rapidly (Hitzert et al., 2014) and the ability to inhibit attention toward irrelevant stimuli (Markant & Amso, 2014). This provides evidence for the continuity of cognitive processes. Essentially, children who, from the start, are efficient at attending to, taking in, and interpreting sensory information score well on later intelligence tests. However, other items, such as performance on motor skills, do not relate well to later IQ.

## INFORMATION PROCESSING AND PIAGETIAN ABILITIES

As we discussed in the Piagetian Approach section, there is evidence that several of the cognitive abilities Piaget described as developing toward the end of the sensorimotor stage seem to arise much earlier. Here we consider categorization, causality, object permanence, and number, all of which depend on formation of mental representations (refer to Table 2).

**Categorization** Adults can understand that plants and animals are both living things. Furthermore, they can understand that some animals are pets, that among those pets are cats and dogs, and that a chihuahua is a type of dog. These nested relationships are known as categories. Dividing the world into meaningful categories is vital to thinking about objects or concepts and their relationships. It is the foundation of language, reasoning, problem solving, and memory.

According to Piaget, the ability to group things into categories does not appear until around 18 months. However, visual preference paradigms using behaviorally based looking measures have been able to assess infants at earlier ages. This research has shown that newborns distinguish between closed (e.g., triangles and squares) and open (e.g., crosses) shapes but are unable to categorize different types of closed shapes (e.g., equilateral and isosceles triangles) until about 3 to 4 months of age. By 3 to 4 months, they can also distinguish between, for example, a dog and a cat or between a chair and a bed by looking longer at items in a new category (Rakison & Yermolayeva, 2010). Brain imaging has found that basic components of the neural structures needed to support categorization are functional within the first 6 months of life (Quinn et al., 2006). Experience matters too. After being presented with a variety of photographs of pets, 4-month-old infants with pets at home were better at recognizing individual cats and forming categories representing cats than infants without pets at home (Kovack-Lesh et al., 2008).

Infants at first seem to categorize on the basis of perceptual features, such as shape, color, and pattern, but by 12 to 14 months, their categories become conceptual, based on real-world knowledge, particularly of function (Mandeler, 2007). In one series of experiments, 10- and 11-month-olds recognized that chairs with zebra-striped upholstery belong in the category of furniture, not animals (Pauen, 2002). As time goes on, these broad concepts become more specific. For example, 2-year-olds recognize particular categories, such as “car” and “airplane,” within the overall category of “vehicles” (Mandler, 2007).

Categorization is not limited to visual stimuli. There is evidence that 3-month-old babies categorize words differently than tones (Ferry et al., 2010) and can even categorize musical chords into dissonant versus consonant and major versus minor dimensions (Virtala et al., 2013). Furthermore, in the 2nd year, language becomes a factor in categorization. For example, when a noun is applied towards two similar objects, children pay more attention to their commonalities and are more likely to treat those objects as members of the same category. However, when different nouns are applied to those objects, children are more likely to attend to the differences between them and categorize them as distinct from each other (LaTourrette & Waxman, 2020).



*Seven-month-old babies appear to understand that an object incapable of self-motion, such as a tennis ball, must be set in motion by a causal agent, such as a hand.*

Pixelbliss/Shutterstock

**Causality** Eight-month-old Aviva accidentally squeezes her toy duck and it quacks. Startled, she drops it, and then, staring at it intently, she squeezes it again. Aviva is beginning to understand causality—the principle that one event (squeezing) causes another (quacking). Piaget believed that at about 4 to 6 months, as infants become able to grasp objects, they begin to recognize that they can act on their environment. However, he believed they did not yet know that causes must come before effects and that forces outside of themselves can make things happen. He maintained that this understanding develops slowly during infants' 1st year.

However, information-processing studies suggest that an understanding of causality emerges earlier. In one study, infants as young as 4½ months were able to understand simple causality (a ball knocking another ball out of position). However, only those infants who had practiced playing with a Velcro-covered ball and Velcro mittens—allowing them to easily manipulate the ball despite their immature motor control and therefore practice performing causal actions—were able to do so (Rakinson & Krogh, 2012).

By 8 months of age, infants make causal attributions for simple events even when they cannot see the actual moment of contact between the two objects (Muetener & Carey, 2010). And by 10 to 12 months old, the types of inferences made by infants become even more sophisticated. For example, 10- to 12-month-old infants looked longer when a hand emerged from the opposite side of a stage onto which a beanbag had been thrown than when the hand emerged from the same side as the beanbag, suggesting the infants understood that the hand had probably thrown the beanbag. The infants did not have the same reaction when a toy train rather than a hand appeared or when the thrown object was a self-propelled puppet (Saxe et al., 2005).

It may be that, with age, infants accumulate more information about how objects behave; thus, they are better able to see causality as a general principle operating in a variety of situations (Cohen et al., 2002). Increasing experience with the environment may also be a factor. For example, 7-month-olds who had begun to crawl recognized self-propulsion of objects, but noncrawling 7-month-olds did not. This finding suggests that infants' ability to identify self-propelled motion is linked to the development of self-locomotion, which gives them new ways of understanding objects in their world (Cicchino & Rakison, 2008). Self-locomotion has also been linked to infants' ability to predict the goal of other people's intentional failed actions (such as trying, but failing, to reach an object) (Brandone, 2015).

**Object Permanence** When Piaget investigated object permanence, he used infants' motor responses to gauge whether or not infants understood that a hidden object still existed. Their failure to reach for the hidden object was interpreted to mean they did not. However, it was possible that infants understood object permanence but could not demonstrate this knowledge with motor activity.

If in the course of your everyday life, you encountered something outside of your expectations, you would probably stop to look at it to try to figure out why it was occurring. Babies are no different. When they encounter something that is puzzling or surprising, they scrutinize it until they have analyzed it to their satisfaction and it is no longer interesting. Because they are capable of controlling their visual behavior to some degree, this gives researchers a way to ask them what they know.

The **violation-of-expectations** research method begins with a familiarization phase in which infants see an event happen normally. After the infant becomes bored and has habituated to this procedure, the event is changed in a way that conflicts with—or violates—normal expectations. If the baby looks longer at this changed event, researchers assume the additional interest shown by the baby implies that the baby is surprised.

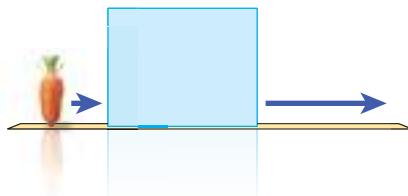
For example, in one experiment, infants as young as 3½ months were first shown an animation of a carrot moving back and forth behind a screen (Hespé & Bailargeon, 2008). The center of the screen was notched, and a tall carrot should have shown momentarily as it moved in front of the notch, as shown in Figure 2. In the “possible” event, the carrot could be seen as it passed in front of the notch. In the “impossible” event, the carrot would appear at one side, never show in the middle, and then emerge

#### violation-of-expectations

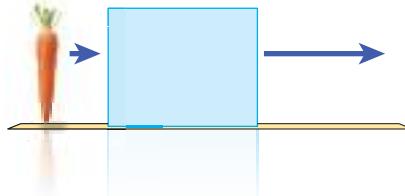
Research method in which dishabituation to a stimulus that conflicts with expectation is taken as evidence that an infant recognizes the new stimulus as surprising.

## Habituation Events

Short carrot event

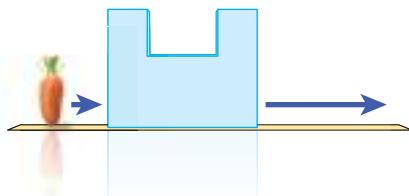


Tall carrot event

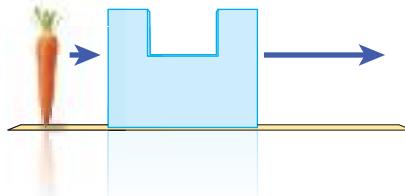


## Test Events

Possible event



Impossible event



**FIGURE 2**

### How Early Do Infants Show Object Permanence?

In this experiment, 3½-month-olds were first habituated to a tall and short carrot passing in front of a screen. Then, in the test event, the carrot passed behind the screen. Babies looked longer at the impossible event than at the possible event, suggesting that they were surprised that the tall carrot did not reappear in the notch.

Source: Adapted from Baillargeon & DeVos (1991).

out the opposite side. Infants showed surprise by looking longer at the “impossible” event, indicating that the “impossible” event violated their expectations.

This procedure was important to the study of object permanence because for babies to be surprised by the carrot’s failure to show, they needed to be able to remember that the carrot continued to exist. Thus, it provided evidence for the development of the ability at much younger ages than Piaget thought possible. Moreover, this methodology has allowed researchers to investigate a wider series of questions about what infants do and do not expect about the world and allowed us to ask these questions at much earlier ages than would otherwise be possible. For example, we now know that infants have object permanence, expect that objects should not appear and disappear randomly, and realize that you should not be able to hide tall objects inside of short objects (Baillargeon, 2004). More generally, it appears infants have a skeletal understanding of physical concepts such as gravity, inertia, and physical continuity. Some researchers have argued that, at some level, infants have innate, naïve expectations about the physical principles of the world around them (Baillargeon & Carey, 2012).

**Number** The violation-of-expectations paradigm can also be used to ask babies questions about their understanding of numbers. In one classic study, infants watched as Mickey Mouse dolls were placed behind a screen and a doll was either added or taken away. The screen then was lifted to reveal either the number of dolls that should have been there or a different number of dolls. Babies looked longer at surprising “wrong” answers than at expected “right” ones, suggesting that they had mentally computed the right answers (Wynn, 1992).

Subsequent to this study, multiple programs of research supported infants’ ability to discriminate between small sets of numbers (Baillargeon & Carey, 2012). Increasing evidence suggests that humans have an innate intuitive sense of number. For example, newborns are able to relate a visual array of 4 or 12 triangles or circles with the auditory presentation of 4 or 12 sounds (such as “tu-tu-tu-tu” or “ra-ra-ra-ra”) (Izard et al., 2009).



Babies seem to use a rudimentary understanding of probability in figuring out other people’s preferences. For example, if they see a person pick a blue toy out of a box filled primarily with red toys, they will assume that person likes blue toys. If a person picks a blue toy out of a box filled with equal amounts of red and blue toys, they are less likely to assume there was a preference for blue toys. In a way, they are performing a probability analysis of the likelihood of each act and basing their assumptions on that (Wellman et al., 2016).

At 4 months, infants can distinguish between a 1:4 change and can distinguish between an even smaller 1:3 change when they are provided with redundant auditory (e.g. chime) and visual information (Wang & Feigenson, 2021). Studies such as these suggest that even at this early age, number is an abstract concept that can be represented across different sensory modalities. Furthermore, brain imaging research has identified the intraparietal sulcus as the likely region responsible for this system (Kersey & Cantlon, 2018). Moreover, the ability, in infancy and preschool, to estimate approximate numbers is related to later mathematical achievement, and this relationship is particularly true for lower-achieving students (Starr et al., 2013; Bonny & Lourenco, 2013).

## EVALUATING INFORMATION-PROCESSING RESEARCH

Some theorists argue we must be wary of overestimating infants' cognitive abilities from data that may have simpler explanations. They argue that an infant's visual interest in an impossible condition may reveal a perceptual awareness that something unusual has happened rather than a conceptual understanding of the way things work. For instance, if an infant looks longer at one scene than another, it may just be because the two scenes look different from each other rather than because of any conceptual processes. (Goubet & Clifton, 1998; Haith, 1998).

However, violation-of-expectations studies and other recent information-processing research with infants raise the possibility that at least rudimentary forms of categorization, causal reasoning, naïve physics, and number sense may be present in the early months of life. One proposal is that infants are born with reasoning abilities—innate learning mechanisms that help them make sense of the information they encounter—or that they acquire these abilities very early (Baillargeon et al., 2011). Some investigators go further, suggesting that infants at birth may already have intuitive core knowledge of basic physical principles in the form of specialized brain modules that help infants organize their perceptions and experience (Spelke, 2017; Baillargeon & Carey, 2012).

### checkpoint can you ...

- ▶ Discuss three areas in which information-processing research challenges Piaget's account of development?
- ▶ Describe the violation-of-expectations research method, tell how and why it is used, and list some criticisms of it?

## Cognitive Neuroscience Approach

### cognitive neuroscience approach

Approach to the study of cognitive development that links brain processes with cognitive ones.

Research suggests that sleep and dreaming help with memory consolidation. And babies, like adults, show better memory for material following a nap (Konrad et al., 2016).



### implicit memory

Unconscious recall, generally of habits and skills; sometimes called *procedural memory*.

### explicit memory

Intentional and conscious memory, generally of facts, names, and events.

The **cognitive neuroscience approach** examines the hardware of the central nervous system to identify what brain structures are involved in specific areas of cognition. Current brain research bears out Piaget's assumption that neurological maturation is a major factor in cognitive development. Brain growth spurts (periods of rapid growth and development) coincide with changes in cognitive behavior (Fischer, 2008).

Some researchers have used brain scans to determine which brain structures are tied to cognitive functions and to chart developmental changes. These brain scans provide physical evidence of the location of two separate long-term memory systems—**implicit** and **explicit**—that acquire and store different kinds of information and mature at different rates (Bauer et al., 2007). **Implicit memory** refers to remembering that occurs without effort or even conscious awareness; for example, knowing how to tie your shoe or throw a ball. It most commonly pertains to habits and skills. Implicit memory seems to develop early and is demonstrated by such actions as an infant's kicking on seeing a familiar mobile (Nelson, 2005). **Explicit memory**, also called declarative memory, is conscious or intentional recollection, usually of facts, names, events, or other things that can be stated or declared. Delayed imitation of complex behaviors is evidence that declarative memory has developed. This is because delayed imitation requires a representation of a behavior to be stored in memory. While infants cannot yet speak, and thus the memory cannot be technically be “declared,” this is nonetheless a demonstration of symbolic representation (Bauer et al., 2007).

Explicit memory involves a conscious and deliberative process and thus is subject to cultural influences (Hayne et al., 2015). Implicit memory, however, is more automatic and early appearing, and seems to be little affected by culture (Kolling et al., 2016). For example, at 6 months of age, German and Cameroonian Nso infants are equally good at deferred imitation tasks (Goertz et al., 2011). However, by 9 months of age, cultural differences begin to emerge, and German infants are more likely to imitate actions directed at toys than are Nso infants. The researchers attributed this to the German infants' greater experience with toys (Graf et al., 2014). Experience does not affect implicit memory in the same way. German infants, at 3 months of age, kick more frequently than Nso infants, presumably because they spend more time lying down alone. Nso infants spend the majority of their time being carried, which restricts their legs. However, these early experiences do not seem to have an effect on infants' ability to establish and remember implicit responses. When their legs were attached to a mobile so that kicks made it move, the key factor in learning and memory was how much an infant kicked, not cultural experiences. Infants who kicked too frequently were less able to notice the mobile's contingent responses to their movements. Culture affected memory but only insofar as it affected the frequency of kicking (Graf et al., 2012).

In early infancy, when the structures responsible for memory storage are not fully formed, memories are relatively fleeting. The rapid growth of the hippocampus, a structure deep in the temporal lobes along with the development of cortical structures coordinated by the hippocampal formation make longer-lasting memories possible. Growth is most rapid in the first two years of life but continues until approximately 9 to 11 years of age (Uematsu et al., 2012).

The prefrontal cortex (the large portion of the frontal lobe directly behind the forehead) is believed to control many aspects of cognition. In infancy, the prefrontal cortex helps children with attentional, memory, and inhibitory processes. This part of the brain develops more slowly than any other, making it more sensitive to environmental disruption (Hodel, 2018; Kolb et al., 2012). During the second half of the 1st year, the prefrontal cortex and associated circuitry develop the capacity for **working memory** (Pelphrey et al., 2004). Working memory is short-term storage of information the brain is actively processing, or working on. For example, when you try to estimate how much an item on sale will cost, you are using working memory to make the calculations. Working memory can be overwhelmed, as when someone speaks to you while you try to calculate the sale price. Working memory appears relatively late in development and may be responsible for the slow development of object permanence, which seems to be seated in a rearward area of the prefrontal cortex (Bell, 2012; Nelson, 1995).

Although memory systems continue to develop beyond infancy, the early emergence of the brain's memory structures underlines the importance of environmental stimulation from the first months of life. Social-contextual theorists and researchers pay particular attention to the impact of environmental influences.



Babies remember things better when they are in the same mood at encoding as they are at retrieval (Seehagen et al., 2021).

#### working memory

Short-term storage of information being actively processed.

#### checkpoint can you ...

- Identify the brain structures apparently involved in explicit, implicit, and working memory, and mention a task made possible by each?

## Social-Contextual Approach

Researchers influenced by Vygotsky's sociocultural theory and working within the **social-contextual approach** are interested in how cultural context affects early social interactions. From the very beginning, choices made about child care are socialization tools that transmit cultural information. For example, in the United States, slightly over 20 percent of mothers report sharing a bed with their babies (Smith et al., 2016). In line with individualistic goals, parents often report sleeping separately is necessary for the child to build independence. However, in many nonindustrialized and traditional societies, bed sharing is the norm, and indeed forcing a baby to sleep separately from their mother is seen as abusive or neglectful. In this case, the collectivistic ideals call for integrating the baby into the social group (Ball, 2006).

#### social-contextual approach

Approach to the study of cognitive development that focuses on environmental influences, particularly parents and other caregivers.

### guided participation

Adult's participation in a child's activity that helps to structure it and bring the child's understanding of it closer to the adult's.

Rogoff (2003) points out that despite the varied ways in which children learn, they all learn what they need to learn to be effective adults in that culture. She argues there is no "one best way"; rather, there are multiple, equally valid ways of learning.



How children are expected to learn about their world also varies with culture. In many cultures, children learn in regimented ways within a formal educational system. By contrast, some cultures use **guided participation**. Guided participation refers to mutual interactions with adults that help structure children's activities and bridge the gap between a child's understanding and an adult's. This concept was inspired by Vygotsky's view of learning as a collaborative process. Guided participation often occurs in shared play and in ordinary, everyday activities in which children informally learn the skills, knowledge, and values important in their culture.

For example, in a series of cross-cultural studies (Göncü et al., 2000; Rogoff et al., 1993), researchers visited the homes of 1- to 2-year-old children in four culturally different places: a Mayan town in Guatemala, a tribal village in India, and middle-class urban neighborhoods in Salt Lake City and Turkey. The investigators interviewed caregivers about their child-rearing practices and watched them help the toddlers learn to dress themselves and to play with unfamiliar toys.

Cultural differences affected the types of guided participation the researchers observed. In the Guatemalan town and the Indian village, the children customarily played while the mother worked nearby. When children needed to be shown how to do something, such as tie their shoes, the mothers tended to provide an initial demonstration and instruction, and then allow the children to take over while they remained available to help if needed. The instruction was primarily nonverbal. The US toddlers, who had full-time caregivers, interacted with adults in the context of child's play rather than work or social worlds. Caregivers managed and motivated children's learning with praise and excitement. Their instruction was highly verbal in nature, often consisting of "lessons." Turkish families, who were in transition from a rural to an urban way of life, showed a pattern somewhere in between.

The cultural context influences the way caregivers contribute to cognitive development. Direct adult involvement in children's play and learning may be better adapted to a middle-class urban community, in which parents or caregivers have more time, greater verbal skills, and possibly more interest in children's play and learning, than to a rural community in a developing country, in which children frequently observe and participate in adults' work activities (Rogoff et al., 1993). Indeed, in nonindustrial cultures, mothers are typically involved in other activities while nursing or caring for infants, leaving them little time to engage in deliberative learning activities with a child (Takada, 2012). However, despite the different means by which caregivers teach their children valuable life skills, all children learn the things they need to be effective members of society.

The social constructionist approach has been influential in early childhood education. Research has shown that preschool programs that are highly focused on academic skills are not necessarily ideal for young children (Bordrova, 2008). Indeed, such programs may even result in lower academic achievement later in school (Marcon, 2002). Guided play programs, by contrast, take advantage of children's natural motivation to play—supporting their autonomy and cultivating their love of learning while also scaffolding specific learning outcomes (Weisberg et al., 2016). For example, a geometry lesson in which 4- to 5-year-old children donned detective hats and were guided through solving a "mystery of the shapes" sorting task where they were asked to discover the secret distinguishing "real" shapes from "fake" ones was more effective in teaching shape knowledge than either didactic teaching or free play (Fisher et al., 2013).

Additionally, social constructionist approaches to early childhood education may have positive effects on other variables important for later academic achievement. For example, when compared to children enrolled in a child-centered preschool and kindergarten, children in a highly academic program did significantly worse on a number of motivational measures. The children in the academically oriented programs rated their own abilities as lower, expected less success in academics, were more dependent on adults, were less proud of their accomplishments, and found school more worrisome (Stipek et al., 1995).

### checkpoint can you ...

- Give an example of how cultural patterns affect caregivers' contributions to toddlers' learning?

# Language Development

**Language** is a communication system based on words and grammar. Once children know words, they can use them to represent objects and actions. They can reflect on people, places, and things; and they can communicate their needs, feelings, and ideas in order to exert more control over their lives.

In this section, we look first at a typical sequence of milestones in language development (Table 2) and at some characteristics of early speech. Then we consider how babies acquire language, how brain growth is linked to language development, and how parents and other caregivers contribute to it.

## language

Communication system based on words and grammar.

## CLASSIC THEORIES OF LANGUAGE ACQUISITION: THE NATURE-NURTURE DEBATE

Is linguistic ability learned or inborn? In the 1950s, a debate raged between two schools of thought: one led by B. F. Skinner, the foremost proponent of learning theory, the other by the linguist Noam Chomsky.

Skinner (1957) maintained that language learning, like other learning, is based on experience and learned associations. According to classic learning theory, children learn language through the processes of operant conditioning. At first, babies utter sounds at random. Caregivers reinforce the sounds that happen to resemble adult speech. Infants

**TABLE 2** Language Milestones from Birth to 3 Years

Age in Months	Development
Birth	Can perceive speech, cry, make some response to sound
2	Makes sounds other than crying, reacts to loud sounds
4	Responds to sound, coos and turns head towards others' voices
6	Takes turns making sounds, blows raspberries and makes squealing noises
9	Babbles in strings of consonants and vowels, lifts arms to be picked up
12	Waves bye-bye, calls parents "mama" or "dada" or other special names, understands "no"
15	Uses 1–2 words other than "mama" or "dada," follows directions given with a gesture and words, looks at familiar objects when they are named, points to ask for something or to get help
18	Uses 3 or more words besides "mama" and "dada," follows directions without gestures
24	Points to things in a book when asked to identify them, says at least 2 words together (e.g., "more milk"), points to at least 2 body parts when asked, uses gestures such as blowing a kiss or nodding yes
30	Says around 50 words, says at least 2 words with one action word (e.g., "doggie run"), names things in a book when asked, says words such as "I," "me," or "we"
36	Talks in conversations with at least 2 back-and-forth exchanges; asks who, what, where or why questions; says what action is happening in a picture when asked (e.g., "running"); says first name when asked; speaks well enough for most people to understand

Source: Zubler et al. (2022).



*Is linguistic ability learned or inborn? Though inborn language capacity may underlie this baby's ability to speak, when this mother repeats the sounds her baby makes, she is reinforcing the likelihood the baby will repeat those sounds—highlighting the influences of both nature and nurture.*

Leolintang/Shutterstock

#### nativism

Theory that human beings have an inborn capacity for language acquisition.

#### language acquisition device (LAD)

In Chomsky's terminology, an inborn mechanism that enables children to infer linguistic rules from the language they hear.

### checkpoint can you...

- Summarize how learning theory and nativism seek to explain language acquisition and point out strengths and weaknesses of each theory?
- Discuss implications of how deaf babies acquire language?

#### prelinguistic speech

Forerunner of linguistic speech; utterance of sounds that are not words. Includes crying, cooing, babbling, and accidental and deliberate imitation of sounds without understanding their meaning.

then repeat these reinforced sounds, and language is gradually shaped. Social learning theorists extended this early model to account for imitation. According to social learning theory, babies imitate the sounds they hear adults make and, again, are reinforced for doing so.

For example, Lila, while babbling to herself, inadvertently says "da." Her parents hear her and provide her with smiles, attention, and praise for this sound. Lila is thus reinforced and continues to say "da." Eventually, her parents no longer provide as much reinforcement for the sound. But then Lila happens to say "dada," perhaps by imitating her parents. Now her parents once again reward her lavishly. Again, their praise eventually tapers off, and now the word is only reinforced when her father is present. Over time, her parents' selective reinforcement of closer and closer approximations to speech in the right context results in the shaping of language.

Observation, imitation, and reinforcement do contribute to language development, but, as Chomsky (1957) persuasively argued, they cannot

fully explain it. For one thing, word combinations and nuances are so numerous and so complex that they cannot all be acquired by specific imitation and reinforcement. In addition, caregivers often reinforce utterances that are not strictly grammatical, as long as they make sense ("Gampa go bye-bye"). Adult speech itself is an unreliable model to imitate, as it is often ungrammatical and contains false starts, unfinished sentences, and slips of the tongue. Also, learning theory does not account for children's imaginative ways of saying things they have never heard, such as when 2-year-old Clara indignantly said, "I am mostly ruly!" after being told she was unruly.

Chomsky's view is called **nativism**. Unlike Skinner's learning theory, nativism emphasizes the active role of the learner. Chomsky (1957, 1972, 1995) proposed that the human brain has an innate capacity for acquiring language; babies learn to talk as naturally as they learn to walk. He suggested that an inborn **language acquisition device (LAD)** programs children's brains to analyze the language they hear and to figure out its rules.

Support for the nativist position comes from newborns' ability to differentiate phonemes easily, suggesting that they are born with perceptual "tuning rods" that pick up characteristics of speech. Nativists point out that almost all children master their native language in the same age-related sequence without formal teaching. Furthermore, our brains have structures that have been shown to be directly implicated in language use (Friederici, 2011), which is what would be predicted on the basis of the nativist position. Still, the nativist approach does not tell us why some children acquire language more rapidly and efficiently than others, why children differ in linguistic skill and fluency, or why (as we'll see) speech development appears to depend on having someone to talk with, not merely on hearing spoken language.

Most developmental scientists today maintain that language acquisition, like most other aspects of development, depends on an intertwining of nature and nurture. Children have an inborn capacity to acquire language, which may be activated or constrained by experience.

## SEQUENCE OF EARLY LANGUAGE DEVELOPMENT

Before babies can use words, they make their needs and feelings known through sounds that progress from crying to cooing and babbling, then to accidental imitation, and then deliberate imitation. These sounds are known as **prelinguistic speech**. They go hand in

hand with calibration of babies' perceptual system with their native language. Babies are then ready to engage in language, an ability expressed both with their gestures as well as their first words and sentences.

**Early Vocalization** Crying is a newborn's first means of communication. Different pitches, patterns, and intensities signal hunger, sleepiness, or anger (Lester & Boukydis, 1985). Adults find crying aversive for a reason: It motivates them to find the source of the problem and fix it (Leerkes et al., 2012); thus, crying has great adaptive value. Although all newborns cry instinctively, even at this early age they are influenced by culture. The intonation patterns and fundamental frequency of their cries vary with the language they have been exposed to (Mampe et al., 2009; Wermke et al., 2016). For example, research with French, Arabic, and Italian infants showed qualitative differences in the acoustical properties of infant cries that were related to the prosodic features (i.e., the melody, intensity, and rhythm) of their native languages (Manfredi et al., 2019).

Between 6 weeks and 3 months, babies start cooing when they are happy—squealing, gurgling, and making vowel sounds like “ahhh.” **Babbling—repeating consonant-vowel strings, such as “ma-ma-ma-ma”—occurs between ages 6 and 10 months and is often mistaken for a baby’s first word.** Until about 9 months, babbling is language-general, meaning babies across different cultures babble in roughly the same way. However, after this time, babbling gradually becomes calibrated to sound patterns the baby has repeatedly heard (Cychosz et al., 2019). Babbling, although initially nonsensical, becomes more wordlike over time.

Imitation is key to early language development. First, infants accidentally imitate language sounds. Generally, they are reinforced by their parents' positive responses and thus encouraged to produce such sounds more and more over time. Then, at about 9 to 10 months, infants deliberately imitate sounds without understanding them. Once they have a repertoire of sounds, they string them together in prelinguistic speech patterns that sound like language but seem to have no meaning. Finally, after infants become familiar with the sounds of words and phrases, they begin to attach meanings to them (Fernald et al., 2006; Jusczyk & Hohne, 1997).

Joint attentional processes are important here. Babies who monitor and attend to an interaction partner's eye gaze at 12 months show better expressive and receptive language development at 24 months (Salo et al., 2018). Notably, this relationship is only true when babies are interacting with someone speaking their native language. When interacting with a nonnative speaker, infants attend more carefully to their partner's mouth (Pons et al., 2019).

**Perceiving Language Sounds and Structure** Imitation of language sounds requires the ability to perceive subtle differences between sounds. Infants' brains seem to be preset to discriminate basic linguistic units, perceive linguistic patterns, and categorize them as similar or different (Kuhl, 2004).

Phonemes are the smallest units of sound in speech. For example, the word *dog* has three phonemes: the *d*, the *o*, and the *g* sound. Every language has its own unique phonology, or system of sounds, that is used in the production of speech. At first, infants can perceive and discriminate the sounds used in any language. In time, however, exposure to a native language commits the brain's neural networks to further learning of the patterns of the infant's native language and constrains future learning of nonnative language patterns (Kuhl, 2014). This exposure can either occur prenatally or postnatally. If a mother speaks two languages regularly during pregnancy, her newborn baby will recognize both languages and be more interested in listening to speakers in the languages they were previously exposed to. Even more important, the baby will show differential responses to both languages, suggesting that even newborns have some understanding that two language systems are involved and that they are sensitive not just to the overall sounds but to the patterns and rhythms that distinguish the two languages (Byers-Heinlein et al., 2010).

By 6 to 7 months, hearing babies have learned to recognize the phonemes used in their native language (Kuhl et al., 1992), and by 8 months, they begin to lose sensitivity



Sometimes making a particular sound results in a tongue position more or less suited toward making another sound. So, for example, "da" is easier to say for a baby than "bi." When you look at the most common kinship terms across cultures, they almost all use some variation of "ba," "pa," "da," and "ma." These are, not coincidentally, the easiest sounds for babies to make.

to phonemes that are not used in their native language (Gervain & Mehler, 2010). By the end of the 1st year, babies lose their sensitivity to sounds that are not part of the language or languages they usually hear spoken. This process begins earlier for vowels and later for consonants (Kuhl & Rivera-Gaxiola, 2008). The ability to discriminate native-language sounds at this age predicts individual differences in language abilities during the 2nd year (Tsao et al., 2004), whereas nonnative sound discrimination does not (Kuhl et al., 2005). The increased sensitivity to native sounds helps the child more efficiently acquire language. Interestingly, analogous processes occur in deaf children with gestures (Kuhl & Rivera-Gaxiola, 2008).

One-year-olds babble in their native language. In other words, their babbling follows the phonological rules of their language.



How does this change occur? One hypothesis is that infants mentally compute the relative frequency of particular phonetic sequences in their language and learn to ignore sequences they infrequently hear (Werker et al., 2012). Another hypothesis is that early language experience modifies neural structures, facilitating detection of word patterns in the native language while suppressing attention to nonnative patterns that would slow native language learning. In support of this, toddlers who, at 7½ months, had shown better neural discrimination of native phonemes were more advanced in word production and sentence complexity at 24 months and at 30 months than toddlers who, at 7½ months, had been better able to discriminate phonetic contrasts in nonnative languages (Kuhl & Rivera-Gaxiola, 2008).

In addition to learning what the phonemes in their language are, babies also learn the rules for how they fit together. For example, in English, the sound combination in “kib” is acceptable, although “kib” is not a word. However, the nonsense word “bnik” breaks the phonological rules in English as a “b” and an “n” are not typically found next to each other within the same word. Between 6 and 12 months, babies begin to become aware of the phonological rules of their language, and research suggests they have a mechanism for discerning abstract rules of sentence structure. Moreover, as they learn the intonation patterns and syntactical rules of language, they use their emerging knowledge to help them learn new words.

Babies also begin to recognize sound patterns they hear frequently, such as their name. Five-month-old infants listen longer to their name than to other names (Newman, 2005). Six-month-olds are more likely to look at a video of a bear when they hear the word *bear* than when they hear the word *dog* (Bergelson & Swingley, 2015). Infants at 8 months discern perceptual cues such as syllables that usually occur together (such as *ba* and *by*) and store these possible word forms in memory. They

also notice pronunciation, stress placed on syllables, and changes in pitch. This early auditory learning lays the foundation for later vocabulary growth (Swingley, 2008).



Children who learn tonal languages, where variations in pitch are important, are better at identifying tonal contrasts in speech than children learning nontonal languages, particularly before 18 months of age.

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**Cultural Differences in Perceptual Attunement** A less well-studied aspect of language development involves the developmental progression of infants learning tonal languages. This is surprising given the majority of world languages are tonal in nature (Singh & Fu, 2016). In tonal languages, a word can assume different meanings based on the pitch used when speaking it. For example, Thai has five different lexical tones (low, mid, high, rising, and falling), and the tone used when speaking a word changes its meaning (Kitamura et al., 2014).

Although calibrated perception for phonemes used in a baby’s native language emerges at about 6 to 12 months of age, a similar language-specific perception for tone appears to emerge even earlier. In one experiment, 4-month-old babies raised in

English-speaking homes were able to recognize tonal contrasts but at 9 months were unable to do so. Cantonese and Thai babies, who were learning a tonal language, retained their ability to discriminate tonal contrasts over this time period (Yeung et al., 2013). Through a year of age, babies learning a tonal language are better at distinguishing lexical tones and become increasingly accurate at doing so (Tsao, 2017). However, nontonal learning infants' tonal sensitivity rebounds at about 17 to 18 months. It appears as if their increasing sensitivity to prosodic (intonation, stress, and rhythm) features of speech may be responsible. As nontonal language children learn more about the social context of speech and the nonverbal information that is relayed by vocal tone, they may once again direct their attention to pitch and thus regain some sensitivity (Liu & Kager, 2014).

As with other aspects of language, these early experiences appear to shape the brain architecture along culturally prescribed paths. Brain scans showed that neurons in the auditory portion of the brain stems of adult speakers of Mandarin and Thai were more sensitive to changes in pitch than were those of English speakers (Krishnan et al., 2010).

**Gestures** Before babies can speak, they gesture. At 11 months, Maika pointed to her cup to show she wanted it. By 12 months, Maika learned some conventional social gestures: waving bye-bye and nodding her head to mean yes. By 13 months, she would hold her arms up to show she wanted to be picked up. By using gestures, babies show an understanding that symbols refer to specific objects, events, desires, and conditions.

By 12 months, most babies have learned some conventional social gestures; for example, waving bye-bye and shaking the head for "no." By about 13 months, they use more elaborate representational gestures; for example, holding an empty cup to the mouth to indicate thirst. Symbolic gestures, such as blowing to mean "hot" or sniffing to mean "flower," often emerge around the same time that babies say their first words. Toddlers often combine gestures with words. Gesture-word combinations serve as a signal that a child is about to begin using multiword sentences (Goldin-Meadow, 2007). Girls show a developmental advantage and use gestures at a slightly earlier age than do boys (Özçalışkan & Goldin-Meadow, 2010).

Generally, research has found that infants across all cultures use gestures and that the use of gestures increases with age. Gestures usually appear before children have a vocabulary of 25 words and drop out when children learn the word for the idea they were gesturing (Lock et al., 1990).

However, culture influences the particular form those gestures take. For example, children in the United States and Germany are more likely to use gestures such as reaching, pointing, showing, holding their arms out to be picked up, or signaling "stop." By contrast, babies in Taiwan are more likely to sign "quiet." These differences reflect cultural values, and they increase with age (Kwon et al., 2018). Italian babies, whose parents gesture more than Americans, use more spontaneous signs than do babies from the United States (Iverson et al., 2008). A comparison of three cultural groups found that the degree of direct social interaction was the key predictor for the development of gestures. Mayan infants, who had the least direct social interaction, gestured the least, followed by Dutch children. Chinese infants had the greatest degree of social interaction and the most and earliest gestures (Salomo & Liszkowski, 2013).

The use of gestures seems to help babies learn to talk. Pointing, for example, is positively correlated with later language development (Colonna et al., 2010), and early gestures in general are a good predictor of later



*Some features of lullabies appear to be universal. As indexed by heart rate, pupil dilation, and skin conductance, babies relax when they hear lullabies, even if they've never heard them before and the lullabies are in a different language (Bainbridge et al., 2021).*



*This toddler is communicating with his father by pointing at something that catches his eye. Gesturing seems to come naturally to young children and may be an important part of language learning.*  
Photodisc/Getty Images

Research showed that mothers who took their babies to baby sign-language classes were more stressed than mothers who did not (Howlett et al., 2011). Given that length of time spent in classes was not related to increased stress, the researchers concluded that the classes did not cause stress. What is an alternative explanation for the finding?

#### linguistic speech

Verbal expression designed to convey meaning.

#### holophrase

Single word that conveys a complete thought.

vocabulary size (Goldin-Meadow, 2007). For instance, pointing at 1 year of age is positively associated with language skills at 5 and 6 years of age (Luke et al., 2020). Parents' own gestural use also influences infants. In one study, parents' use of gestures predicted their child's use of gestures at 14 months, which in turn predicted the size of the child's vocabulary at 42 months (Rowe et al., 2008). These data, however, refer to the spontaneous use of gestures and may not apply to the deliberate training of gestures to infants. Teaching preverbal children to use sign language has not been shown to accelerate their language development, but it also does not appear to be harmful (Kirk et al., 2013; Fitzpatrick et al., 2014).

**First Words** Babies understand many words before they can use them. Six-month-olds are more likely to look at a picture of a banana when they hear the word *banana* than when they hear other common nouns (Bergelson & Swingley, 2012).

The average baby says a first word between 10 and 14 months, initiating **linguistic speech**—verbal expression that conveys meaning. By 13 months, most children understand that a word stands for a specific thing or event, and they can quickly learn the meaning of a new word (Gurteen et al., 2011). Additionally, they may use a simple syllable to mean more than one thing depending on the context in which it is used or the vocal intonation. For example, “*Da!*” may mean “I want Daddy now!” while “*Daddy?*” may mean “Where is Daddy?” An entire sentence expressed with one word is known as a **holophrase**.

Between 10 months and 2 years, there is a shift from simple associations to following social cues. At 10 months, infants tend to assume a new word they hear refers to whatever object they find most interesting, whether or not the name is correct for that object. At 12 months, they begin to pay attention to cues from adults, such as looking or pointing at an object while saying its name. However, they still learn words only for interesting objects and ignore uninteresting ones. By 18 to 24 months, children follow social cues in learning words, regardless of the intrinsic interest of the objects (Golinkoff & Hirsh-Pasek, 2006). At 24 months, children quickly recognize the names of familiar objects in the absence of visual cues (Swingley & Fernald, 2002). Additionally, if presented with a familiar object and a novel object, 24-month-old children will assume a novel term refers to the novel object and quickly learn and remember that term (Spiegel & Halberda, 2011).

Receptive vocabulary—what infants understand—continues to grow as verbal comprehension gradually becomes faster and more accurate and efficient (Fernald et al., 2006). Generally, infants have a far greater receptive vocabulary than an expressive—or spoken—vocabulary. By 18 months, 3 out of 4 children can understand 150 words and can say 50 of them (Kuhl, 2004). Children with larger vocabularies and quicker reaction times can recognize spoken words from just the first part of the word. For example, when they hear *daw* or *ki* they will point to a picture of a dog or kitten (Fernald et al., 2001). This early language learning is closely related to later cognitive development. Late talkers who are quick to recognize words at 18 months are more likely to show accelerated vocabulary growth in the next year than those who are slower at word recognition (Fernald & Marchman, 2012), and children's speed of recognition of spoken words and vocabulary size at 25 months predict linguistic and cognitive skills at 8 years (Marchman & Fernald, 2008).

Addition of new words to the expressive (spoken) vocabulary is slow at first. Then, sometime between 16 and 24 months, a “naming explosion” may occur (Ganger & Brent, 2004). Within a few months, many toddlers go from saying about 50 words to saying several hundred (Samuelson & McMurray, 2017). Rapid gains in spoken vocabulary reflect increases in speed and accuracy of word recognition during the 2nd year (Fernald et al., 2006). Children also use their growing knowledge of syntax to puzzle out word meaning (Fisher et al., 2010), as well as an understanding that things belong in categories (Samuelson & McMurray, 2017).

Nouns seem to be the easiest type of word to learn (Waxman et al., 2013), perhaps because it is easier to form a mental image of nouns (McDonough et al., 2011) and “image-

ability” is associated with learning and memory (O’Neill, 2005). In a cross-cultural study, Spanish, Dutch, French, Hebrew, Italian, Korean, and US parents all reported that their 20-month-old children knew more nouns than any other class of words (Bornstein et al., 2004). A similar advantage has emerged for nouns in laboratory studies where children have been taught novel nouns and verbs (Imai et al., 2008).

Verbs are more difficult for children to learn, in part because the actions they represent are generally transitory (Liu et al., 2019). If children look away at the wrong moment, get distracted, or focus on the wrong part of the behavior, they may miss the opportunity to associate the action and verb. Nouns, by contrast, are generally concrete items that may not require the same sort of sustained attention.

The structure of language can provide support for verb learning. For example, children tend to learn verbs most easily in languages in which surrounding noun phrases are explicitly mentioned (“The girl is petting the dog”), and they have a more difficult time mapping meaning to verbs when the surrounding verb phrases are dropped (“She’s petting it”) (Waxman et al., 2013). Moreover, once children understand syntax, they can use this knowledge to buttress their emerging abilities. For example, knowledge of the syntactical structure of “I’m VERBing it” can help them learn new verbs (Erickson & Thiessen, 2015).

**First Sentences** The next important linguistic breakthrough comes when a toddler puts two words together to express one idea (“Want juice”). Generally, children do this between 18 and 24 months. However, this age range varies greatly. Although prelinguistic speech (such as babbling) is fairly closely tied to chronological age, linguistic speech is not. Most children who begin talking fairly late catch up eventually.

A child’s first sentences typically deal with everyday events, things, people, or activities. Children typically use **telegraphic speech**, consisting of only a few essential words. When Lamaya says, “Want juice,” she means, “I want some juice.” Children show their implicit understanding of the fundamental rules for putting sentences together—or **syntax**—with the word order they use. Syntax allows us to understand and produce an infinite number of utterances, and it is why Lamaya does not say “Juice want” when asking for a drink.

Between 20 and 30 months, children show increasing competence in syntax. At this age, children also become more comfortable with articles (*a, the*), prepositions (*in, on*), conjunctions (*and, but*), plurals, verb forms, and forms of the verb *to be* (*am, are, is*). They also become increasingly aware of the communicative purpose of speech and of whether their words are being understood (Dunham et al., 2000)—a sign of growing sensitivity to the mental lives of others. By age 3, speech is fluent, longer, and more complex (Rice et al., 2010).

## VARIATIONS IN LANGUAGE DEVELOPMENT

Deaf babies seem to learn sign language in much the same fashion and in the same sequence as hearing infants learn speech, providing they are raised in a language-rich environment (Lederberget al., 2013). Just as hearing babies of hearing parents imitate vocal utterances, deaf babies of deaf parents seem to imitate the sign language they see their parents using, first stringing together meaningless motions and then repeating them over and over in what has been called hand-babbling. As parents reinforce these gestures, the babies attach meaning to them (Pettito & Marentette, 1991; Pettito et al., 2001).

Deaf babies begin hand-babbling between ages 7 and 10 months, about the age when hearing infants begin voice-babbling (Pettito et al., 2001). Deaf babies also tend to sign their first word at about 1 year of age and begin to string together multiple words between 18 to 24 months, using the correct word order to indicate syntax, just as hearing babies do (Hoffmeister & Wilbur, 2017; Meier, 1991). These observations suggest that an inborn language capacity may underlie the acquisition of both spoken and signed language and that advances in both kinds of language are tied to brain maturation (Kuhl, 2010).



To acquire a language, children must learn about 1.5 megabytes of data—the equivalent of learning and remembering 1,000 to 2,000 bits of information every day from birth to age 18 years (Mollica & Piantadosi, 2019).

### telegraphic speech

Early form of sentence use consisting of only a few essential words.

### syntax

Rules for forming sentences in a particular language.



The term telegraphic speech is derived from the fact that telegrams used to be billed by the word. To save money, people would eliminate all but the essential components of speech in much the same way that babies use only the words best able to communicate their intent.

## checkpoint can you...

- Trace a typical sequence of milestones in early language development?
- Describe five ways in which early speech differs from adult speech?

# research in action

## STRENGTH VERSUS DEFICIT: CONTEXTUALIZING RESEARCH IN LANGUAGE DEVELOPMENT

Cross-cultural research in psychology clearly indicates there are a multitude of ways in which children learn the skills they need to be effective members of society. However, the different paths taken across different cultures are not always viewed as equivalent. A cultural deficit model of development focuses on needs or problems, implying that different groups do not achieve as well as majority groups because the culture is deficient in important ways.

Traditionally, research has used “counts” (i.e., the number of words in one’s vocabulary) to compare the quantitative differences in language knowledge between monolingual and bilingual children. However, these counts can contribute to deficit language, which is language that privileges one group (i.e., monolingual children) over another group (i.e., bilingual children) without considering the distinct circumstances faced by each group (Buchanan et al., 2021). For example, bilingual children typically have smaller vocabularies per language than monolinguals (Bialystok et al., 2010; Hoff et al., 2012). This is because bilingual children must learn twice as much language information as their monolingual peers. However, characterizing monolinguals as having a larger vocabulary size than bilinguals may unintentionally convey that bilinguals are developmentally behind monolinguals in language learning.

In contrast, a strengths-based approach recognizes group differences and emphasizes the unique strengths in each group that may contribute to their development (Buchanan et al., 2021). Because language is typically connected to culture, bilingual children may grow up in a household that values two cultures (Schieffelin & Ochs, 1986). Therefore, along with hearing two languages, bilingual children also receive richer cultural knowledge. For example, Latino/a caregivers who raise English-Spanish bilingual children may incorporate cultural values (i.e., respect) through language and behaviors. Caregivers may praise child obedience and respect during interactions, which is shown to support child vocabulary outcomes and simultaneously teach the child about culturally specific values (Adamson et al., 2021). Therefore, it is important to use a strength-based approach when comparing monolingual and bilingual children, as they undergo different experiences, which positively contribute to development in unique ways.



How do other environmental differences between monolingual and bilingual children account for differences in language development? Which other research fields in child development can foster a strengths-based approach?



*Children in bilingual homes often use elements of both languages, but this doesn't mean they confuse the two languages.*

Uniquely India/photosindia/Getty Images

In households in which more than one language is spoken, babies achieve similar milestones in each language on the same schedule as children who hear only one language (Petitto & Kovelman, 2003). However, children learning two languages tend to have smaller vocabularies in each language than children learning only one language (Hoff, 2006). Although they may have smaller vocabularies, they show advantages in other areas. Bilingual children tend to have more advanced nonverbal executive control skills and theory of mind, and an earlier understanding of syntactical and morphological rules of language (Barac et al., 2014; Research in Action).

Bilingual children often use elements of both languages, sometimes in the same utterance—a phenomenon called **code mixing** (Petitto & Kovelman, 2003). In Montreal, children as young as 2 in dual-language households differentiate between the two languages,

using French with a French-speaking parent and English with an English-speaking parent (Genesee et al., 1995). This ability to shift from one language to another is called **code switching**, and it is associated with linguistic competence (Yow et al., 2018).

#### code mixing

Use of elements of two languages, sometimes in the same utterance, by young children in households where both languages are spoken.

## CHARACTERISTICS OF EARLY SPEECH

Early speech has a character all its own, no matter what language a child is speaking. As we have seen, young children simplify. They use telegraphic speech to say just enough to get their meaning across (“No drink milk!”).

Young children understand grammatical relationships they cannot yet express. For example, Nina understands that a dog is chasing a cat but does not yet produce multiple-word sentences easily, so her sentence comes out as “Puppy chase” rather than “The puppy is chasing the kitty.” The order of the words shows she understands the underlying syntactic rules: She does not say “Kitty chase.”

Another way children illustrate their growing knowledge of syntax is overregularization. Overregularization occurs when children inappropriately apply a syntactical rule. For instance, when children say sentences such as “Daddy goed to the store” or “I drawed that,” they are applying the English language rule “add *-ed* to a verb to make it past tense.” It takes a while for children to learn the rule as well as the exceptions to it. For example, children commonly use the exceptions to the rule first. They generally learn these by rote for phrases they commonly hear (“Daddy went to the store”). Then they learn the rule and use that to fill in the blanks when they can’t recall the exception (“Daddy goed to the store”). By early school age, as they become more proficient in language, they memorize the exceptions and begin to apply them, once again saying the phrase correctly (“Daddy went to the store”).

Children also make categorical mistakes by either underextending or overextending word meaning. When they underextend word meanings, they use words in too narrow of a category. For example, Lisa knows their family pet is a “doggy.” However, she shakes her head no when her mother points out other dogs outside their home. To her, her dog, and only her dog, is a “doggy.” Lisa is underextending the word *doggy* by restricting it to only her pet. Alternatively, children also overextend word meanings by using words in too broad of a category. At 14 months, Amir jumped in excitement at the sight of a gray-haired man on the television screen and shouted, “Gampa!” Amir was overgeneralizing, or overextending, a word. He thought that because his grandfather had gray hair, all gray-haired men could be called “Gampa.”

## INFLUENCES ON EARLY LANGUAGE DEVELOPMENT

What determines how quickly and how well children learn to understand and use language? Research has focused on both neurological and environmental influences.

**Brain Development** Brain scans, which measure changes in electrical potential at particular brain sites during cognitive activity, have allowed us a window into the developing brains of toddlers. Our brains have structures that have been shown to be directly implicated in language use (Friederici, 2011). Thus, it is not surprising the tremendous brain growth during the early months and years is closely linked with language development.

How effectively various brain systems develop has implications for later language development. For example, newborn babies who showed more activity in the parietal regions of the brain had better declarative memory and auditory comprehension at 15 months (Brito et al., 2016). Similarly, babies who were better at processing auditory information at 6 weeks of age, as indexed by brain activity, were more advanced in their language development at 9 months of age (Chonchaiya et al., 2013). A link also exists between the brain’s phonetic perception and motor systems as early as 6 months—a connection that becomes even stronger at 6 to 12 months (Imada et al., 2006).

Brain scans confirm the sequence of vocabulary development outlined earlier in this chapter. Brain activation tends to focus on the left temporal and parietal lobes in toddlers

#### code switching

Changing one’s speech to match the situation, as in people who are bilingual.

with large vocabularies, whereas in toddlers with smaller vocabularies, brain activation is more scattered (Kuhl & Rivera-Gaxiola, 2008). Cortical regions associated with language continue to develop until at least the late preschool years or beyond—some, even until adulthood.

In many ways, the brains of young children, even before they begin to speak, process language similarly to adult brains. For example, both infants and adults process speech sounds in parallel and hierarchical streams. In other words, they process multiple features of speech (e.g., who the speaker is, emotion, intensity, sound, timbre, familiarity) across multiple brain regions. Additionally, frontal brain regions are involved in the processing of speech in infants as they are in adults, although in infants, this process is slower. Last, the processing of linguistic information is localized in the left hemisphere in infants as it is in almost all adults (Dehaene-Lambertz, 2017; Dehaene-Lambertz & Spelke, 2015).

**Social Interaction and the Linguistic Environment** Language is a social act. It requires interaction. Language takes not only the necessary biological machinery and cognitive capacity but also interaction with a live communicative partner. Children who grow up without normal social contact do not develop language normally. Neither do children who are exposed to language only through television. For example, in one experiment, 9-month-old English-speaking infants learned and retained Mandarin when they played and interacted with adults speaking Mandarin but not when they merely watched television in Mandarin (Kuhl & Rivera-Gaxiola, 2008). A series of experiments on baby vocabulary videos showed that infants and toddlers did not learn new words from videos (DeLoache et al., 2010; Richert et al., 2010), even when researchers made sure the infants were paying attention to the content of the video (Krcmar, 2011). It was not the video that is at fault; rather, it was the lack of contingent social interaction that impeded learning. When infants engage in socially contingent video chats, they are able to learn new words (Roseberry et al., 2014). Moreover, such learning is enhanced in the presence of a peer: When infants are given an interactive touch screen pad, they are better at learning and recognizing nonnative phonemes when in the presence of another infant than by themselves (Lytle et al., 2017).

At the babbling stage, adults can help an infant advance toward true speech by repeating the sounds the baby makes and rewarding their efforts. When babies begin to talk, parents or caregivers can boost vocabulary development by repeating their first words and pronouncing them correctly. Socially contingent interactions such as these help children learn new words (Roseberry et al., 2014). Most babies find this engaging and repeat the sounds back. Parents' imitation of babies' sounds affects the amount of infant vocalization (Goldstein et al., 2003) and the pace of language learning (Schmitt et al., 2011). It also helps babies experience the social aspect of speech (Kuhl, 2004).

Playing peekaboo involves turn-taking, which is what also happens within conversations and most social interactions.



A vast literature has documented early emerging and persistent differences in language development for children between lower and higher socioeconomic groups. Generally, those infants from more disadvantaged backgrounds lag behind their advantaged peers in language development (Fernald & Weisleder, 2015). There are a number of reasons this difference might exist. Certainly, individual child characteristics such as processing speed can be an influence. However, what may be more important are characteristics of the environment. For example, as a whole, parents from higher socioeconomic levels tend to use richer vocabularies and longer utterances, and speak directly more to their children than those from lower socioeconomic levels. Given that a strong relationship exists between the frequency of specific words in mothers' speech and the order in which children learn these words (Brent & Siskind, 2001), as well as between mothers' talkativeness and the size of toddlers' vocabularies (Schmitt et al., 2011), these interactional differences may help explain the disparities. Moreover, parents from more advantaged backgrounds tend to limit their use of punitive or authoritarian parenting, which has been found to dampen language development. Another influence is the availability of other environmental supports—such as books, cognitively stimulating toys, and educational experience—across different income groups. In addition to decreased access

to stimulating materials, factors such as neighborhood violence, high stress, and lead exposure may have a negative effect on language development (Pace et al., 2017). These influences seem to have a greater negative effect on boys than girls (Barbu et al., 2015).

However, such outcomes are not inevitable. Even within socioeconomic groups, there are great disparities in the quantity and quality of language children are exposed to, and many parents from poorer families provide their infants with rich and interactive language environments (Fernald & Weisleder, 2015). Moreover, parental sensitivity, responsiveness, and warmth are positively associated with language development, and this association is stronger in disadvantaged and diverse families and over time (Madigan et al., 2019). For example, low-income parents' joint engagement, shared routines, and connectedness with their children at age 2 predict their expressive language at age 3 (Hirsh-Pasek et al., 2015).



*By reading aloud to their young children and asking questions about the pictures in the book, parents help their children build language skills and learn how letters look and sound.*

Keith Brofsky/Blend Images LLC

**Child-Directed Speech** If, when you talk to an infant or toddler, you speak slowly in a sing-song, high-pitched voice with exaggerated ups and downs, simplify your speech, exaggerate vowel sounds, and use short words and sentences and much repetition, you are engaging in **child-directed speech (CDS)**, sometimes called “parentese,” “motherese,” or baby talk. Most adults and even children do it naturally, and other babyish stimuli, such as puppies or kittens, also can elicit it.

Some investigators challenge the value of CDS, contending that babies speak sooner and better if they are exposed to more complex adult speech (Oshima-Takane et al., 1996). However, “baby talk” has been documented in many cultures, including the United States, Russia, Sweden, Australia, Thailand, Spain, Syria, England, Italy, France, and Germany (Kuhl et al., 1997; Kitamura et al., 2001; Cooper & Asling, 1990; Ferguson, 1964). The ubiquity of this language form across cultures suggests it is universal in nature and serves a function.

Many researchers believe that CDS helps infants learn their native language or at least pick it up faster by exaggerating and directing attention to the distinguishing features of speech sounds. Moreover, infants are “captured” attentionally by the sound and find it highly engaging, resulting in more rapid learning (Golinkoff et al., 2015; Spinelli et al., 2017). Data support this view. For example, infants, even before a month of age, clearly prefer to hear CDS (Dunst et al., 2012; Cooper & Aslin, 1990). In one study, infants who experienced more CDS had larger expressive vocabularies at 2 years of age and seemed to be more adept at processing language (Weisleder & Fernald, 2013). Laboratory data also highlight the support that CDS provides. For example, 21-month-old children were able to learn new words only when CDS speech was used. However, 27-month-old children, who were more sophisticated in their language abilities, were able to use adult-directed speech to learn new words (Ma et al., 2011). Last, infants whose parents were coached in and increased in their use of CDS in the first 18 months of life showed better language outcomes than infants whose parents did not participate in the intervention (Ramirez et al., 2020).

What about cultural differences? Like adults who speak nontonal languages, CDS is used by adults who speak tonal languages where word meaning is transmitted in part via tone; however, a more constrained pitch range is used (Kitamura et al., 2014). In some cultures, young children are simply not spoken to very much. For instance, among the Tsimané forager-horticulturalists of Bolivia, children under the age of 4 receive less than 1 minute of one-on-one verbal interaction per hour (Cristia et al., 2019). Bamana

#### **child-directed speech (CDS)**

Form of speech often used in talking to babies or toddlers; includes slow, simplified speech, a high-pitched tone, exaggerated vowel sounds, short words and sentences, and much repetition; also called *parentese* or *motherese*.



*When babies hear CDS, their heart rate slows, a physiological state that is consistent with orienting toward and absorbing information.*

# window on the world

## LITERACY AND LANGUAGE

Children's emerging language abilities have repercussions for school readiness and later academic achievement, and those who develop language earlier are better prepared to enter school. Early language ability is affected strongly by home environment.

One important influence is being read to. The frequency with which caregivers read to young children can influence how well they speak and eventually how well and how soon they develop **literacy**—the ability to read and write. Reading to children improves their language skills and cognitive abilities, encourages creativity, and promotes social, emotional, and moral development (Crippen, 2017). As parents talk, sing, and read aloud to children, their children's brains are stimulated and strengthened. Reading at a young age helps to create a nurturing bond with and begins a lifelong love of reading (O'Keefe, 2014). Thus, intervention programs targeting home variables (such as

reading to children) are likely be highly effective (Forget-Dubois et al., 2009).

Reading is encouraged in most countries around the world, but access to books and ability to read and write can be deterrents. Nearly 250 million children worldwide are unable to read and write (All Children Reading, 2017). In 2015, Finland had the highest literacy rate, nearly 100 percent, and South Sudan was at the bottom with 27 percent (CIA, 2015). Regardless of how they are transmitted, stories are important in children's educational and social worlds.



What was your favorite children's book? What lessons did you learn from reading this book?

### **literacy**

(1) Ability to read and write. (2) In an adult, ability to use printed and written information to function in society, achieve goals, and develop knowledge and potential.

parents from West African actively discourage children from asking questions or expressing their opinions and speak little with them (Polak, 2012). Similarly, Gusii mothers of Kenya, although they are highly responsive physically to their infants and hold and cuddle them when they are upset, tend not to speak to or make eye contact with them to the same degree as American parents (Richman et al., 2010). Regardless of their exposure, however, all babies learn to talk. Moreover, even if babies are not spoken to directly, they are nonetheless immersed in a rich linguistic environment that feeds their hungry minds and shapes their developing intellect.

### checkpoint can you ...

- Name areas of the brain involved in early language development, and tell the function of each?
- Explain the importance of social interaction, and give at least three examples of how parents or caregivers help babies learn to talk?
- Assess the arguments for and against the value of child-directed speech (CDS)?

# summary and key terms

## Studying Cognitive Development

- Six approaches to the study of cognitive development are behaviorist, psychometric, Piagetian, information-processing, cognitive neuroscience, and social-contextual.
- All of these approaches can shed light on how early cognition develops.  
**behaviorist approach** (125)  
**psychometric approach** (125)  
**Piagetian approach** (125)  
**information-processing approach** (125)  
**cognitive neuroscience approach** (125)  
**social-contextual approach** (125)

## Behaviorist Approach

- Two simple types of learning that behaviorists study are classical conditioning and operant conditioning.
- Research suggests that infants' memory processes are much like those of adults, though this conclusion has been questioned. Infants' memories can be jogged by periodic reminders.  
**classical conditioning** (125)  
**operant conditioning** (126)

## Psychometric Approach

- Psychometric tests measure factors presumed to make up intelligence.
- Developmental tests, such as the Bayley Scales of Infant and Toddler Development, can indicate current functioning but are generally poor predictors of later intelligence.

- The home environment may affect measured intelligence.
- If the home environment does not provide the necessary conditions that pave the way for cognitive competence, early intervention may be needed.

**intelligent behavior** (127)

**IQ (intelligence quotient) tests** (127)

**Bayley Scales of Infant and Toddler Development** (127)

**Home Observation for Measurement of the Environment (HOME)** (128)

**early intervention** (129)

## Piagetian Approach

- During Piaget's sensorimotor stage, infants' schemes become more elaborate. They progress from primary to secondary to tertiary circular reactions and finally to the development of representational ability, which makes possible deferred imitation, pretending, and problem solving.
- Object permanence develops gradually, according to Piaget, and is not fully operational until 18 to 24 months.
- Research suggests that a number of abilities, including imitation and object permanence, develop earlier than Piaget described.

**sensorimotor stage** (130)

**schemes** (130)

**circular reactions** (130)

**representational ability** (131)

**object permanence** (132)

**deferred imitation** (133)

**dual representation hypothesis** (135)

## Information-Processing Approach

- Information-processing researchers measure mental processes through habituation and other signs of visual and perceptual abilities. Contrary to Piaget's ideas, such research suggests that representational ability is present virtually from birth.
- Indicators of the efficiency of infants' information processing, such as speed of habituation, tend to predict later intelligence.
- Information-processing research techniques such as habituation, novelty preference, and the violation-of-expectations method have yielded evidence that infants as young as 3 to 6 months may have a rudimentary grasp of such Piagetian abilities as categorization, causality, object permanence, a sense of number, and an ability to reason about characteristics of the physical world. Some researchers suggest that infants may have innate learning mechanisms for acquiring such knowledge.

**habituation** (136)

**dishabituation** (136)

**visual preference** (137)

**visual recognition memory** (137)

**joint attention** (137)

**cross-modal transfer** (138)

**violation-of-expectations** (140)

## Cognitive Neuroscience Approach

- Explicit memory and implicit memory are located in different brain structures.
- Working memory emerges between 6 and 12 months of age.
- Neurological developments help explain the emergence of Piagetian skills and memory abilities.  
**cognitive neuroscience approach** (142)  
**implicit memory** (142)  
**explicit memory** (142)  
**working memory** (143)

## Social-Contextual Approach

- Social interactions with adults contribute to cognitive competence through shared activities that help children learn skills, knowledge, and values important in their culture.  
**social-contextual approach** (143)  
**guided participation** (144)

## Language Development

- The acquisition of language is an important aspect of cognitive development.
- Prelinguistic speech includes crying, cooing, babbling, and imitating language sounds. By 6 months, babies have learned the basic sounds of their language and have begun to link sound with meaning. Perception of categories of sounds in the native language may commit the neural circuitry to further learning in that language only.
- Before they say their first word, babies use gestures.
- The first word typically comes sometime between 10 and 14 months, initiating linguistic speech. For many toddlers, a naming explosion occurs sometime between 16 and 24 months.
- The first brief sentences generally come between 18 and 24 months. By age 3, syntax and communicative abilities are fairly well developed.
- Early speech is characterized by oversimplification, underextending and overextending word meanings, and overregularizing rules.
- Deaf children seem to learn sign language similarly to how hearing children learn spoken language.
- Two classic theoretical views about how children acquire language are learning theory and nativism. Today, most developmental scientists hold that an inborn capacity to learn language may be activated or constrained by experience.

- Influences on language development include neural maturation and social interaction.
- Family characteristics, such as socioeconomic status, adult language use, and maternal responsiveness, affect a child's vocabulary development.
- Children who hear two languages at home generally learn both at the same rate as children who hear only one language, and they can use each language in appropriate circumstances.
- Child-directed speech (CDS) seems to have cognitive, emotional, and social benefits, and infants show a preference for it. However, some researchers dispute its value.  
**language** (145)  
**nativism** (146)  
**language acquisition device (LAD)** (146)  
**prelinguistic speech** (146)  
**linguistic speech** (150)  
**holophrase** (150)  
**telegraphic speech** (151)  
**syntax** (151)  
**code mixing** (152)  
**code switching** (153)  
**child-directed speech (CDS)** (155)  
**literacy** (156)

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## outline

- Foundations of Psychosocial Development
- Developmental Issues in Infancy
- Developmental Issues in Toddlerhood
- Relationships with Other Children
- Children of Working Parents
- Child Maltreatment

## learning objectives

- Discuss the development of emotions and personality in infancy.
- Describe infants' social relationships with caregivers, including attachment.
- Discuss the emerging sense of self, autonomy, and moral development in toddlerhood.
- Explain how social contexts influence early development.
- Explain child maltreatment and its effects.



# Psychosocial Development during the First Three Years



Courtesy of Natalie Weaver

## did you know?

- Pride, shame, and guilt are among the later emotions to develop.
- Conflict with siblings or playmates can help toddlers learn to negotiate and resolve disputes.
- The impact of parental employment and early child care is much less than that of family characteristics, such as a mother's sensitivity to her child.

*In this chapter, we examine foundations of psychosocial development. We look at relationships with caregivers, the emerging sense of self, the foundations of conscience, and the transmission of culture. We explore relationships with siblings and other children, and consider the impact of parental employment and child care. Finally, we discuss child maltreatment and what can be done to protect children from harm. We do this all the while considering the ways in which children begin to respond to and mirror the cultural influences surrounding them.*

**O**nly grown-ups think that the things children say come out of nowhere. We know they come from the deepest parts of ourselves.

—bell hooks (1952–2021)

# Foundations of Psychosocial Development

Although babies share common patterns of development, each, from the start, shows a distinct **personality**: the relatively consistent blend of emotions, temperament, thought, and behavior that makes each person unique. From infancy on, personality development is intertwined with social relationships; this combination is called psychosocial development. See Table 1 for highlights of psychosocial development during the first 3 years.

## personality

The relatively consistent blend of emotions, temperament, thought, and behavior that makes a person unique.

## EARLY EMOTIONAL DEVELOPMENT

**Emotions** such as fear are subjective reactions to experience that are associated with physiological and behavioral changes. People differ in how often and how strongly they feel a particular emotion, in the kinds of events that may produce it, in the physical manifestations they show, and in how they act as a result.

## emotions

Subjective reactions to experience that are associated with physiological and behavioral changes.

**TABLE 1** Highlights of Infants' and Toddlers' Psychosocial Development, Birth to 36 Months

Age in Months	Characteristics
2	Calm down when spoken to or picked up, look at faces, and smile when talked to or smiled at
6	Know familiar people, enjoy looking in the mirror at themselves, and laugh
9	Are shy, clingy, or fearful around strangers, show facial expressions (e.g., happy, sad, angry, and surprised), look when their name is called, show separation distress when caregivers leave, and smile and laugh at peekaboo
15	Imitate other children, show interesting objects to others, clap when excited, hug dolls or stuffed toys, and show affection to caregivers (e.g., hugs, kisses)
18	Point to interesting things, look at a few pages in a book with an adult, put their hands out for adults to wash them, and help adults dress them (e.g., pushing arm through sleeve)
24	Notice when others are hurt or upset, and look at adults' faces to see how to react in a new situation
30	Play next to and sometimes with other children, show off to parents (e.g., "Look at me!"), follow simple routines such as helping to pick up toys
36	Notice other children and join them to play, calm down within 10 minutes after being dropped off, such as at childcare

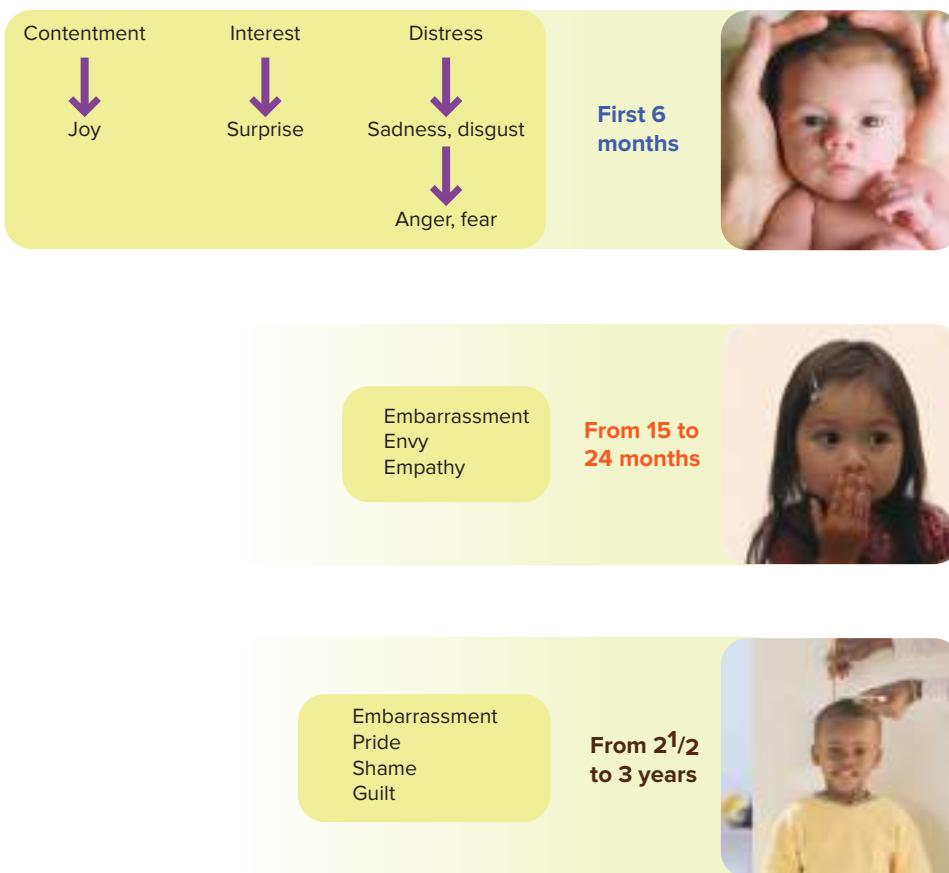
Source: Adapted from Zubler et al. (2022).

**FIGURE 1**

## Differentiation of Emotions during the First 3 Years

The primary, or basic, emotions emerge during the first 6 months or so; the self-conscious emotions develop beginning in the 2nd year, as a result of the emergence of self-awareness together with accumulation of knowledge about societal standards. Note: There are two kinds of embarrassment. The earlier kind does not involve evaluation of behavior and may simply be a response to being singled out as the object of attention. Evaluative embarrassment, which emerges during the 3rd year, is a mild form of shame.

Source: Adapted from Lewis (1997). (Infant): Davis Frare Photography/Brand X Pictures/Corbis; (Girl): Amos Morgan/Photodisc/Getty Images; (Boy): Comstock Images/Getty Images



Crying is the most powerful way, and sometimes the only way, that babies can communicate their needs. Parents may soon learn to recognize whether their baby is crying because of hunger, anger, frustration, or pain.

Irina Rogova/Shutterstock

Emotional development is an orderly process; complex emotions unfold from simpler ones. According to one model (Lewis, 1997; Figure 1), babies show signs of contentment, interest, and distress soon after birth. These are diffuse, reflexive, mostly physiological responses to sensory stimulation or internal processes. During the next 6 months or so, these early emotional states differentiate into true emotions: joy, surprise, sadness, disgust, and then anger and fear—reactions to events that have meaning for the infant. The emergence of these basic, or primary, emotions is related to neurological maturation.

**Crying** Newborns plainly show when they are unhappy. They let out piercing cries, flail their arms and legs, and stiffen their bodies. Adults find the sound of crying unpleasant—and therein lies its function. Crying is the primary way in which infants communicate their needs and is considered to be an honest signal of need. Human brains are wired to respond to such sounds with caregiving behaviors (Kim et al., 2016). Research in Argentina, Belgium, Brazil, Cameroon, France, Kenya, Israel, Italy, Japan, South Korea, and the United States has indicated this process is cross-cultural and that the motivating features of infant cries are strongest in mothers (Bornstein et al., 2017).

Features of infants' cries are related to their physiological state. A higher pitch and a more monotonic vocalization is associated with autonomic system activity during stressful procedures in infants (Stewart et al., 2013) and is more characteristic of the cries of preterm infants, who generally have higher needs, than full-term infants of the equivalent age (Shinya et al., 2016). There are also developmental changes in cry frequency. A meta-analysis conducted across a number of countries, including the United States, Japan, Germany, Denmark, Canada, the Netherlands, and the United Kingdom, showed high fuss and cry durations over the first 6 weeks of life, with crying significantly diminishing between 6 and 12 weeks of age (Wolke

et al., 2017). This does not appear to be a function of living in developed countries, as a similar pattern has been found in the nomadic !Kung of the Kalahari (Barr et al., 1991).

As children age, they begin to realize that crying serves a communicative function. By 5 months of age, babies have learned to monitor their caregivers' expressions and if ignored will first cry harder in an attempt to get attention and then stop crying if their attempt is unsuccessful (Goldstein et al., 2009). Boys and girls, as infants, show similar patterns of sadness and anger; however, by the toddler years, boys express more anger than girls (Chaplin & Aldao, 2013).

*Smiling and Laughing* The earliest faint smiles occur spontaneously soon after birth, apparently as a result of subcortical nervous system activity. These involuntary smiles frequently appear during periods of REM sleep.

*Early smiles are sometimes known as "windy grins" because they can occur in response to gas.*



**Social smiling**, when newborn infants gaze and smile at their parents, develops in the 2nd month of life. Babies generally start using a social smile at the same time and in the same way regardless of culture. However, by 12 weeks of age, infants smile at others more or less frequently depending on the responses of adults around them (Wörmann et al., 2012). **Laughter** is a smile-linked vocalization that becomes more common between 4 and 12 months, when it may signify the most intense positive emotion (Sal-kind, 2005).

Parents often try to elicit smiles and laughs from their young children by clowning. Clowning includes silly, nonverbal behaviors such as odd facial expressions or sounds, actions such as revealing a usually hidden body part (such as a belly button), and imitating another's odd actions. Babies try to join in the humor, most commonly starting at 3 months of age, by shrieking or making faces (Mireault et al., 2012). By 5 months of age, babies will laugh at absurd events (such as when a clown nose being worn by an adult is repeatedly beeped as a funny noise is made) even when adults remain affectively neutral (Mireault et al., 2018). **Anticipatory smiling**—in which infants smile at an object and then gaze at an adult while continuing to smile—rises sharply between 8 and 10 months and seems to be among the first types of communication in which the infant refers to an object or experience. By about a year of age, although babies still check in with parents when they see an ambiguous event, they no longer find an event funny if their parents do not (Mireault et al., 2014), illustrating their growing understanding of others.

**Self-Conscious Emotions** **Self-conscious emotions**, such as embarrassment, empathy, and envy, arise only after children have developed **self-awareness**: the cognitive understanding that they have a recognizable identity, separate and different from the rest of their world. This consciousness of self seems to emerge between 15 and 24 months. Self-awareness is necessary before children can be aware of being the focus of attention, identify with what other "selves" are feeling, or wish they had what someone else has.

By about age 3, having acquired self-awareness plus a good deal of knowledge about their society's accepted standards, rules, and goals, children become better able to evaluate their own thoughts, plans, desires, and behavior against what is considered socially appropriate. Only then can they demonstrate the **self-evaluative emotions** of pride, guilt, and shame (Lewis, 1995).



*Children who do not live up to behavioral standards may feel guilty. Guilt is thought to develop between ages 2½ and 3.*  
enterphoto/Shutterstock



Some parents worry that picking up a crying baby will spoil the infant. However, this is not the case. Infants whose parents respond quickly and sensitively to their cries are later more likely to be high in social competence and positive adjustment (Leerkes et al., 2009).

#### **social smiling**

Beginning in the 2nd month, newborn infants gaze at their parents and smile at them, signaling positive participation in the relationship.

#### **anticipatory smiling**

Infant smiles at an object and then gazes at an adult while still smiling.

### checkpoint can you ...

- Explain the significance of patterns of crying, smiling, and laughing?

#### **self-conscious emotions**

Emotions, such as embarrassment, empathy, and envy, that depend on self-awareness.

#### **self-awareness**

Realization that one's existence and functioning are separate from those of other people and things.

#### **self-evaluative emotions**

Emotions, such as pride, shame, and guilt, that depend on both self-awareness and knowledge of socially accepted standards of behavior.



Self-awareness and an understanding that others can think things that you know are not true is also related to another developmental milestone: lying. Although we do not generally think of it as such, lying is actually a profound developmental achievement.

#### altruistic behavior

Activity intended to help another person with no expectation of reward.

**Altruistic Helping and Empathy** A guest of 18-month-old Zev's father—a person Zev had never seen before—dropped his pen on the floor, and it rolled under a cabinet, where the guest couldn't quite reach it. Zev crawled under the cabinet, retrieved the pen, and gave it to the guest. By acting out of concern for a stranger with no expectation of reward, Zev showed **altruistic behavior**.

The roots of altruism can be seen in early empathic reactions in infancy. For example, infants at 1, 3, 6, and 9 months of age respond to the cries of other infants with cries of their own and facial expressions of distress (Geangu et al., 2010). Infants also form “opinions” about others on the basis of their social behaviors. In one series of experiments (Hamlin & Wynn, 2011), infants watched as a puppet tried to open a box. In one condition, a second “Opener” puppet helped the first puppet open the box, and in another condition, a “Closer” puppet interfered by jumping on the box to slam it shut. When later given the choice, 3-month-old infants preferred to look at and 5-month-old infants preferred to reach for the “Opener” puppet. Age does not seem to influence whether or not infants prefer altruistic puppets over antisocial puppets; however, infants respond more strongly to situations with a “giver and taker” than those with a “helper and hinderer” (Margoni & Surian, 2018).

At 6 and 12 months of age, infants respond to other infants' expressions of anger and distress with pupillary dilation, a sign consistent with emotional arousal (Geangu et al., 2011). By 12 months, infants spontaneously will help an adult reach for or find a toy that has fallen out of reach. By 15 months of age, infants seem to have expectations about fairness, as illustrated by their tendency to stare longer at an unfair distribution of goods than at an equal distribution (Sommerville et al., 2013).

These early infant emotional and cognitive differences foreshadow the development of later prosocial activity. Infants who at 8 to 12 months old are better able to identify others' intentions and engage in more joint attention processes are also more likely at 18 to 25 months to help and share snacks or toys with an adult experimenter (Stout et al., 2021). And, at 15 months, infants who look longer at an unfair sharing of goods are also more likely to share toys later themselves (Sommerville et al., 2013). Similarly, infants who show more concern when others are distressed in their first year of life are more prosocial in their 2nd year of life (Davidov et al., 2021).

By their 2nd birthday, children are likely to help others, share belongings and food, and offer comfort at the distress of others (Dunfield et al., 2011; Warneken & Tomasello, 2009). Interestingly, the tendency to share, to help, and to comfort seem to be unrelated to each other, presumably reflecting separate developmental trajectories. In other words, a baby who shares may not necessarily tend to comfort or help (Dunfield & Kuhlmeier, 2013). Nonetheless, such behavior may collectively reflect **empathy**, the ability to imagine how another person might feel in a particular situation.

Research in neurobiology has identified special brain cells called **mirror neurons**, which may underlie empathy and altruism. Mirror neurons fire when a person does something but also when they observe someone else doing the same thing. By “mirroring” the activities and motivations of others, these neurons may help a person to see the world from someone else's point of view (Iacoboni, 2008). Some theorists doubt the conclusions that have been reached about mirror neurons. They argue that this theory, while intriguing, lacks direct empirical support (Lamm & Majdandzic, 2015).

**Collaborative Activities and Cultural Transmission** The motivation to help and share plus the ability to understand others' intentions together contribute to an important development between 9 and 12 months of age: collaboration with caregivers in joint activities, such as a child passing a pair of socks to their mother to help while getting dressed in the morning. Collaborative activities increase during the 2nd year of life as toddlers become more adept at communication.

Although many of our closest relatives, such as chimpanzees, are able to communicate and learn from each other in impressive and sophisticated ways, they do not share with us our ability and motivation to engage in socially coordinated actions with shared goals. Human children do this readily. For example, young children engage in what is known as overimitation, closely copying all actions they see an adult do, even if some

of the actions are clearly irrelevant or impractical. Chimps, by contrast, will skip steps that don't accomplish anything (Nielsen & Tomaselli, 2010). Research has found overimitation in a wide variety of cultures, including both WEIRD samples and indigenous, hunter-gatherer groups (Hoehl et al., 2019).

Some researchers have argued that our universal propensity to overimitate accounts for our impressive creation of cultural artifacts and institutions. In this view, our biologically shaped transmission of collaborative learning has led to our unique success as a species in this area (Tomasello & Moll, 2010). In support of this, children show enhanced overimitation when in the presence of an adult, suggesting there are social motivations underlying the process (Stengelin et al., 2019). Moreover, research has shown that across cultures, children are capable of generalizing information learned via overimitation to new objects, demonstrating the utility of such social learning (Nielson et al., 2014).

## TEMPERAMENT

From the very first day of life, some babies are fussy; others are happy and placid. Some are active, kicking and squirming restlessly; some lie calmly. Some babies like meeting new people; some shrink from contact. Psychologists call these early individual differences **temperament**. Temperament can be defined as an early-appearing, biologically based tendency to respond to the environment in predictable ways.

**Temperament Patterns and Development** In a pioneering study on temperament, the New York Longitudinal Study, researchers followed 133 infants into adulthood. The researchers asked their parents how active the children were; how regular their hunger, sleep, and bowel habits were; how readily they accepted new people and situations; how they adapted to changes in routine; how sensitive they were to sensory stimuli; whether their mood tended to be joyful or unhappy; and whether they persisted at tasks (Thomas et al., 1968).

The researchers were able to place most of the children in the study into one of three categories:

- Forty percent were **“easy” children**: generally happy, rhythmic in biological functioning, and accepting of new experiences.
- Ten percent were what the researchers called **“difficult” children**: more irritable and harder to please, irregular in biological rhythms, wary of new experiences, and more intense in expressing emotion.
- Fifteen percent were **“slow-to-warm-up” children**: mild but slow to adapt to new people and situations (Thomas & Chess, 1977).

Despite how babies' abilities change vastly in almost all areas over the first year of life, stability in temperament from 2 to 13 months of age is quite high (Bornstein et al., 2015). Studies have found strong links between infant temperament and childhood personality at age 7 (Rothbart et al., 2001) and between temperament at age 3 and personality at ages 18 and 21 (Caspi, 2000). Similarly, researchers investigating positive emotionality, negative emotionality, and constraint (a dimension reflecting the tendency to behave in a controlled fashion) have found stability in these traits from toddlerhood to early childhood and then from early childhood to middle childhood (Neppl et al., 2010). Child gender does not appear to have a strong, systematic effect on this process (Bornstein et al., 2019). In short, there is a wealth of research suggesting temperament is a relatively stable individual difference, perhaps because it is largely inborn and strongly influenced by genetics. This does not mean, however, that temperament is fully formed at birth.

Temperament develops as various emotions and self-regulatory capacities appear, and it can change in response to parental treatment and other life experiences (Belsky et al., 1997; Kagan & Snidman, 2004). Current conceptions of temperament view it as being strongly influenced by genetics early in life, with greater influence wielded by the environment over time as children become more self-directed and autonomous (Shiner et al., 2012).

**Cultural Influences on Temperament** One important environmental influence on the development and stability of temperament is that of culture. Several cultural dimensions

## checkpoint can you . . .

- Trace a typical sequence of emergence of the basic, self-conscious, and evaluative emotions?
- Explain how overimitation might be related to the transmission of cultural knowledge?

### temperament

Characteristic disposition, or style of approaching and reacting to situations.

#### “easy” children

Children with a generally happy temperament, regular biological rhythms, and a readiness to accept new experiences.

#### “difficult” children

Children with irritable temperament, irregular biological rhythms, and intense emotional responses.

#### “slow-to-warm-up” children

Children whose temperament is generally mild but who are hesitant about accepting new experiences.



The way you ask a research question influences the answers you find. The researchers in the New York Longitudinal Study based their data on parental reports—what the parents said about their children—so it is not surprising that the most salient dimensions that emerged were the relative difficulty or easiness of the children.

have been found to affect its expression. The primary influence is that of collectivism and individualism. Other cultural dimensions identified as affecting infant temperament are power distance (how equally distributed power is in a culture), long-term orientation (how focused on the future a culture is), masculinity, and uncertainty avoidance (Putnam & Gartstein, 2017). These dimensions are transmitted via caregiving practices that reinforce important values within a cultural group.

Temperament questionnaires have been translated into many languages and have been widely used in infant research. Generally, it appears the behaviors used to assess temperament are well-represented across a variety of cultures; however, children differ in the way those behaviors may "hang together." For example, highly active infants living in groups in which a high activity level is encouraged are likely to also be outgoing and positive in their affectual responses. This is because their natural tendencies map on to cultural values well. By contrast, when highly active infants are raised in groups in which activity is discouraged, they are more likely to express high levels of negative affect (Enlow et al., 2016).

Infants also differ with respect to average scores on items. For instance, research has shown that infants from the United States are rated by their parents as higher in activity level, vocalization, frustration, and pleasure than babies from both Italy and Norway, who are rated as more cuddly and easy to soothe (Montirosso et al., 2011; Cozzi et al., 2013; Sung et al., 2015), and as higher in negative affectivity than parents of Chilean infants (Farkas & Valloton, 2016). Researchers suggest this may be because mothers in the United States foster greater individuality and assertiveness. By contrast, US babies are rated as more cuddly than infants from Ethiopia, who score higher on negative emotionality and fear and are rated as smiling and laughing less than babies from the United States (Gartstein et al., 2016). In another series of studies, Japanese and Russian infants tended to show higher levels of fear, while babies from Poland and the United States showed higher positive affectivity and vocal reactivity (Gartstein et al., 2010), and Polish babies furthermore showed higher negative affectivity and lower extraversion (Dragan et al., 2011). Findings such as these illustrate that although temperament is quite similar across diverse peoples, the details vary.

#### goodness of fit

Appropriateness of environmental demands and constraints to a child's temperament.

There is a relationship between what a parent says a baby will be like before a child is born and what a parent later says about that child as an infant. In particular, the perceptions of a child as difficult precede the birth of that child (Pauli-Pott et al., 2003). What might explain this finding?



**Goodness of Fit** Children differ, and their ideal environments differ as well. According to many researchers, the key to healthy adjustment is **goodness of fit**—the match between a child's temperament and the environmental demands and constraints the child must deal with. If a very active child is expected to sit still for long periods, if a slow-to-warm-up child is constantly pushed into new situations, or if a persistent child is constantly taken away from absorbing projects, tensions may occur.

Children differ in their susceptibility to environmental influences. For example, infants with difficult or inflexible temperaments may be more susceptible to the quality of parenting than easier infants (Straight et al., 2008). For example, they are at higher risk for both internalizing and externalizing disorders, as well as social and cognitive issues, but only when exposed to negative parenting (Slagt et al., 2016). Difficult children also differ with respect to their response to more positive environments. Some research suggests these children show enhanced outcomes when compared with their lower-risk peers but only in the presence of optimal parenting (Kochanska et al., 2015; Belsky & Pluess, 2009).

**Behavioral Inhibition** Behavioral inhibition has to do with how boldly or cautiously a child approaches unfamiliar objects and situations (Kagan et al., 1984), and it is most clearly seen when babies are presented with novel stimuli. When babies high in behavioral inhibition are presented with a new stimulus, they became physiologically aroused, pumping their arms and legs vigorously and sometimes arching their backs. This feeling of being overaroused is unpleasant for them, and most start to fuss and cry. Approximately 20 percent of babies respond in this way. However, babies low in behavioral inhibition respond quite differently. When presented with a new stimulus, these babies are relaxed. They show little distress or motor activity, and they often calmly stare at new stimuli, sometimes smiling at it. About 40 percent of babies respond in this manner (Kagan & Snidman, 2004).

Inhibited children may be born with an unusually excitable amygdala. The amygdala detects and reacts to unfamiliar events and, in the case of behaviorally inhibited children, responds vigorously and easily to most novel events (Kagan, 2012). As early as 4 months of age, children with greater functional connectivity between their amygdala and the cingulate gyrus (a part of the limbic system involved in processing emotions) express more negative emotions and fewer positive emotions when presented with novel toys and sounds (Filippi et al., 2021). Meta-analyses on brain differences between highly inhibited and uninhibited children have echoed this finding and have also found greater activation in parts of the brain associated with the processing of novelty, threat, rewards, and inhibitory control. Specifically, this includes regions in the basal ganglia (the globus pallidus, putamen, and caudate) and the prefrontal cortex (the middle frontal gyrus) (Clauss et al., 2015). Moreover, children who are highly behaviorally inhibited tend to show greater right frontal electroencephalographic (EEG) asymmetry (Smith & Bell, 2010), a pattern that has been associated more broadly with a tendency toward retreat and withdrawal (Coan & Allen, 2004).

Infants who are identified as inhibited or uninhibited tend to maintain these patterns over time (Kagan & Snidman, 2004). For instance, inhibited toddlers are likely to turn into shy 7-year-olds (Kagan et al., 1988), and behaviorally inhibited 8- to 12-year-old children are less likely as young adults to have a positive, active social life and more likely to live close to their family of origin in adulthood (Gest, 1997). Behavioral inhibition at 14 months has also been associated with introversion and lower social functioning, anxiety, and depression at the age of 26 years (Tang et al., 2020) and a heightened risk of developing a social anxiety disorder later in life (Clauss & Blackford, 2012). Not surprisingly, their amygdalae continue to respond in a vigorous and sustained fashion into adulthood (Blackford et al., 2010).

However, experience can moderate or accentuate early tendencies. Behaviorally inhibited children are more likely to outgrow their inhibition if parents do not completely shield them from new situations and instead provide gentle support and encouragement during anxiety-provoking situations (Kiel et al., 2016), and they are no more likely to suffer from anxiety disorders if their mothers encourage independence but are not overly controlling (Lewis-Morrarty et al., 2012).



## checkpoint can you ...

- Describe the three patterns of temperament identified by the New York Longitudinal Study?
- Assess evidence for the stability of temperament?
- Explain the importance of goodness of fit?
- Discuss evidence of biological influences on shyness and boldness?

## EARLY SOCIAL EXPERIENCES: THE FAMILY

Infant care practices and patterns of interaction vary greatly around the world. In Bali, infants are believed to be ancestors reborn or gods brought to life in human form and thus must be treated with utmost dignity and respect. The Beng of West Africa think young babies can understand all languages, whereas people in the Micronesian atoll of Ifaluk believe babies cannot understand language at all, and therefore adults do not speak to them (DeLoache & Gottlieb, 2000).

In WEIRD cultures, parents may or may not have the option to stay home with a new infant on leave. If parents do not stay home with a new baby, unrelated individuals are usually hired to care for the child. Children are generally asked to sleep in a separate bed from their parents, and they are often fed on a schedule. However, other cultures vary in their treatment of infants. In foraging or pastoralist cultures, babies are cared for almost exclusively by the mother, at least in early infancy (Lancy, 2015). Very rarely must children follow a schedule, and they almost never sleep alone.

**The Mother's Role** Across a variety of cultures, both rural and urban, people describe the ideal mother as someone who is warm and physically loving with children, takes joy in their mutual interactions, shields the baby from danger, praises and talks to the child, and responds quickly and well when the child is sad or in need (Mesman et al., 2016).

In hunter-gatherer cultures, constant contact between mothers and newborn infants is most commonly viewed as vital for the baby's well-being. Mothers tend to hold or carry infants almost constantly, feed them on demand, and sleep in the same bed with them. Often, babies are held in a sling or ride on the mother's back or hip (Lancy, 2015). For example, Ache infants of the Paraguayan rainforest are held almost continually by their

mothers and fed on demand, and they are never put down on the ground or left alone for more than a few seconds (Hill & Hurtado, 1996). Similarly, Gusii mothers of Kenya hold their babies most of the time and hold babies thought to be vulnerable or fragile even more frequently (LeVine & LeVine, 1988). Although maternal care such as this is the dominant pattern, it is not the only one. For instance, among the Efe people of central Africa, infants typically receive care from five or more people in a given hour and are routinely breastfed by other women as well as the mother (Konner, 2017).

In many foraging cultures, care of the child shifts to others, most commonly female kin, once the child begins to walk. For example, among the Gusii women of Kenya, siblings often care for babies while mothers work in the field. Other co-wives in their household, with whom they are often in competition for land inheritance, are not trusted to watch their babies. Hausa mothers in Nigeria and Beng mothers in the Ivory Coast assume older women in their community will help with child care. In Haryana State in north India, mothers care for their babies only 40 percent of the time. Grandmothers, aunts, and the father fill in and assist when needed (LeVine & LeVine, 2016).

Who cares for a child can be affected by relative levels of infant mortality. Among the Gusii in western Kenya, where infant mortality is high, parents prefer to keep their infants close to them, respond quickly when they cry, and feed them on demand (LeVine, 1994). The same is true of Aka hunter-gatherers in central Africa, who move around frequently in small, tightly knit groups marked by extensive sharing, cooperation, and concern about danger. However, Ngandu farmers in the same region but with lower infant mortality, who tend to live farther apart and to stay in one place, are more likely to leave their infants alone and to let them fuss or cry, smile, vocalize, or play (Hewlett et al., 1998).

In countries such as the United States, there is great variability in the type of care parents provide to their children. Some mothers are able to stay home with a new baby. However, working parents often must seek assistance in the form of child care, generally provided by nonkin.

There are suggestions that involved fathers show decreasing testosterone and increasing estradiol over the course of their partner's pregnancy, theorized to be in the service of preparing new dads for parenting and nurturant behaviors (Berg & Wynne-Edwards, 2001).



Aka fathers are known for providing high levels of nurturant infant care.

Nicolas Marino/Mauritius Images GmbH/Alamy Stock Photo

**The Father's Role** Fathers are not always involved in their children's lives. A survey of over 186 different countries showed fathers in 57 percent of cultures were never, rarely, or only occasionally close to their infants (Konner, 2017). For example, Nyar fathers of southern India live apart from their wives and have little to do with their children (Menon, 2001). Kipsigis fathers of Kenya are actively forbidden to see their wives and new babies, and South African Thonga and East African Logoli fathers are not allowed to pick up their infants (Lancy, 2015). Among the Huhot of Inner Mongolia, fathers are traditionally responsible for economic support and discipline and mothers for nurturing. Men almost never hold infants. Fathers interact more with toddlers but perform child care duties only if the mother is absent (Jankowiak, 1992).

Among the Aka of central Africa, in contrast, husbands and wives frequently cooperate in subsistence tasks and other activities and "fathers provide more direct infant care than fathers in any other known society" (Hewlett, 1992). Although they represent the extreme end of the distribution, paternal care is not uncommon in foraging and pastoral societies. In one study of 186 cultures, 43 percent of cultures reported that fathers were either regularly or frequently close to their infants (Konner, 2017).

Cross-cultural studies indicate father involvement is tied to factors such as the ability to accumulate materials goods, the equality of parental contributions to the family diet, population density, how peaceful or warlike a culture is, and the marriage structure of a culture (Hewlett & Macfarlan, 2010). Generally, fathers are viewed as more important in infancy in cultures with bilateral or matrilineal descent, a high degree of monogamy (as opposed to polygyny), little gender segregation, and in areas where large prey animals are absent and where land transport is by humans rather than pack animals (Barry & Paxson, 1971). In some cultures, the role may be taken or shared by someone other than the biological father: the mother's brother, as in Botswana, or a grandfather, as in Vietnam (Engle & Breaux, 1998; Townsend, 1997).

In the United States, fathers' involvement in caregiving has greatly increased as more mothers work outside the home and as concepts of fathering have changed (Cabrera et al., 2000). A father's frequent and positive involvement with his child, from infancy on,

is directly related to the child's well-being and physical, cognitive, and social development, as well as to the avoidance of risk and delinquency (Volker & Gibson, 2014).

## GENDER

Identifying as male or female affects how people look, how they move their bodies, and how they work, dress, and play. All these characteristics—and more—are included in the word **gender**: what it means to be male or female.

Habituation studies have found that 6-month-olds respond differently to male and female voices. By 9 to 12 months, infants can tell the difference between male and female faces, apparently on the basis of hair and clothing. At approximately 19 months, children start to use gendered labels such as “mommies” and “daddies” to describe people in their social world, and those children who begin to use such labels earlier generally show earlier gender-typed play as well (Zosuls et al., 2009). During the 2nd year, infants begin to associate gender-typical toys such as dolls with a face of the correct gender (Martin et al., 2002). How does their growing understanding of the differences they see around them impact their own development?

gender

Significance of being male or female.

**Sex Differences in Infants and Toddlers** Measurable differences between baby boys and baby girls are few. Boys are a bit longer and heavier and may be slightly stronger and more active (Fryar et al., 2021), but they are physically more vulnerable from conception on. Girls are less reactive to stress and more likely to survive infancy (Bale & Epperson, 2015). Boys' brains at birth are about 10 percent larger than girls' brains, a difference that continues into adulthood (Gilmore et al., 2007; Ruigrok et al., 2014). Despite these differences, boys and girls achieve the motor milestones of infancy about the same times.

There is evidence for sex differences in the development of empathy. Baby girls are more likely than boys to cry, and cry longer, when they hear another baby crying (Hoffman, 1977). Girls are also more interested in faces and better at discriminating facial expressions (McClure, 2000). When looking at faces, baby girls tend to focus on the eyes and mouth, suggesting a greater degree of interest in social information (Rennels & Cummings, 2013). As toddlers, girls show more concern at and are more likely to respond prosocially to the distress of others (Zahn-Waxler et al., 1991), and they are better at verbally labelling negative emotions in others (McHarg et al., 2019).

There are also early emerging differences in aggression between boys and girls, which is most clearly illustrated within the context of play. Beginning in toddlerhood, boys are more likely to express anger than girls (Chaplin & Aldao, 2013), and boys as young as 17 months tend to play more actively and aggressively than girls (Baillargeon et al., 2007). This may be why toddlers, and to a lesser extent babies, prefer to play with others of the same sex (Martin et al., 2013; Campbell et al., 2000). This form of segregation in play appears to be driven by play style. Girls play with girls and boys play with boys, not because they necessarily want to but because most children enjoy playing with someone who plays like they do (Maccoby, 1994). For instance, very active and aggressive boys and very sensitive girls are the least likely to play with opposite sex peers (Moller & Serbin, 1996).

There are also consistently identified and robust early preferences for particular types of toys. A preference for gender-typed toys, such as trucks for boys and dolls for girls, appears as young as 3 months of age (Alexander et al., 2009) and increases linearly with age (Davis & Hines, 2020). While children at 12, 18, and 24 months of age show little preference for gender-typed colors (indeed, both seem to prefer reds over blues), they do continue to show gender-typed toy preferences (Jadva et al., 2010). By the age of 2½ years, girls start to prefer the color pink, and boys start to actively avoid it (LoBue & DeLoache, 2011). By 3 years of age, girls, but not boys, show more interest in novel toys labeled as being for their gender and decorated with masculine or feminine colors (Weisgram et al., 2014). Although most of the research has been conducted in WEIRD cultures, the little data available outside of this suggests gender differences in toy preferences are similar across cultures (Davis & Hines, 2020).

Are gender-typed toy preferences innate or the product of socialization processes?

Several lines of evidence are germane to this question. First, toy preferences emerge early

in development, at 3 months of age, and before infants could have formed an understanding of masculine or feminine conceptual categories. Second, similar sex-typed toy preferences have been found in nonhuman primates (Hassett et al., 2008). For example, in one study, female vervets played longer with dolls and pots, while male vervets spent more time playing with cars and balls (Alexander & Hines, 2002). Third, testosterone levels in infancy predict later gender-typed toy preferences (Lamminmäki et al., 2012). These findings suggest that basic gender-typed toy preferences are to some extent innate and do not result entirely from gender socialization processes. Still, socialization influences such as family, peers, and media can have a strong effect on children's toy preferences (Brown & Stone, 2019). For example, the types of toys available in a home predict a child's gendered toy preferences (Boe & Woods, 2018), as does the media children are exposed to (Dinella & Weisgram, 2018).

Last, there are early-appearing sex differences in the processing of visual information. In particular, boys, like men, show an advantage for spatial information. Research has shown that at 3 to 4 months, boys are better than girls at recognizing the mirror image of a previously presented stimulus, an advantage that persists through 9 to 10 months of age (Quinn & Liben, 2014). Boys at 9 months are also more likely than girls to be able to predict the path of an object hidden behind a screen (Wilcox et al., 2012). At 18 months, boys are also better at using the geometry of a room (e.g. the relative length and width) as a cue to orient themselves when other information is not available (Lourenco et al., 2011). Although the task used is important, research generally suggests sex differences in spatial abilities increase over time (Newcombe, 2020).

#### gender-typing

Socialization process by which children, at an early age, learn appropriate gender roles.

**Parental Influences on Gender Differences** Gender-typing is the process by which children learn behavior their culture considers appropriate for each sex. Many of these messages are delivered implicitly through the ways in which parents interact with baby boys and girls. For example, a father might draw extra praise and attention to the brave boy in a book and be more likely to label a sad-looking rabbit in the story as a girl. Children also watch their parents' behaviors carefully—who does the housework, what they say, and their interests and hobbies (Mesman & Groeneveld, 2018).

Generally, parents seem, overall, to be equally warm, sensitive, and responsive to their children and to use relatively similar levels of control for both boys and girls (Jennings et al., 2008; Hallers-Haalboom et al., 2014; Endendijk et al., 2016). However, parents in the United States do nonetheless tend to stereotype baby boys and girls. For example, despite no actual differences in pitch, high-pitched infant cries are more frequently attributed to girls and lower-pitched infant cries are more frequently attributed to boys (Reby et al., 2016), and despite identical performance, mothers of 11-month-old infants expect sons to crawl more effectively than daughters (Mondschein et al., 2000).

Parents also show gendered differences in their treatment. For example, girls are generally allowed a bit more latitude in the expression of negative emotions (Brown et al., 2015). Fathers treat boys and girls more differently than mothers do, even during the 1st year (Snow et al., 1983). During the 2nd year, fathers talk more and spend more time with sons than with daughters (Lamb, 1981). Fathers, overall, play with their children more than mothers do (Lewis & Lamb, 2003) and play more roughly with sons and show more sensitivity to daughters (Kelley et al., 1998; Lindsey et al., 2010). Mothers talk more, and more supportively, to daughters than to sons (Leaper et al., 1998), and girls at this age tend to be more talkative than boys (Leaper & Smith, 2004).

Culture influences these interactions. In the United States, a highly physical style of play is characteristic of many fathers, but Swedish and German fathers usually do not play with their babies this way (Lamb et al., 1982). African Aka fathers (Hewlett, 1987) and those in New Delhi, India, also tend to play gently with small children (Roopnarine et al., 1993). Both the Efe and Lese foraging fathers of Zaire spend a great deal of time in proximity to their children engaged in direct care and nurturance, although relatively little time is spent in active play (Tronick et al., 1992; Roopnarine & Davidson, 2015). Such cross-cultural variations suggest that while nurturing behaviors on the part of mothers and rough play on the part of fathers may be biologically based gender differences, they are strongly culturally influenced.

#### checkpoint can you . . .

- Give examples gender differences in infants and toddlers?
- Discuss ways in which parents might unconsciously influence their child's gender development?

# Developmental Issues in Infancy

How does a dependent newborn become a child with complex feelings and the abilities to understand and control them? Much of this development revolves around relationships with caregivers.

## DEVELOPING TRUST

How do human infants—with their need for extended maternal care—come to trust their needs will be met? According to Erikson (1950), early experiences are the key.

Erikson argued that at each stage in the life span, we are faced with a challenge and a complementary risk. As babies, our first challenge involves forming a **basic sense of trust versus mistrust**. If we are successful, we develop a sense of the reliability of people and objects in our world. We feel safe and loved. The risk, however, is that, instead, we develop a sense of mistrust and feel that those around us cannot be counted on in times of need.

The stage begins in infancy and continues until about 18 months. Ideally, babies develop a balance between trust (which lets them form intimate relationships) and mistrust (which enables them to protect themselves). If trust predominates, as it should, children develop hope and the belief that they can fulfill their needs and obtain their desires (Erikson, 1982). If mistrust predominates, children view the world as unfriendly and unpredictable and have trouble forming quality relationships.

### basic sense of trust versus mistrust

Erikson's first stage in psychosocial development, in which infants develop a sense of the reliability of people and objects.

## checkpoint can you . . .

- Explain the importance of basic trust and identify the critical element in its development?

## DEVELOPING ATTACHMENTS

A young colt follows his mother, trotting quickly to catch up when he falls too far behind. A kitten purrs with pleasure, kneading her mother's stomach as she nurses. A baby rhesus monkey clings to his mother's soft fur with tiny hands. And in a dark room late at night, a newborn infant snuggles close to her mother and is soothed by her calm voice and warm body.

**Attachment** is a reciprocal, enduring emotional tie between an infant and a caregiver, each of whom contributes to the quality of the relationship. From an evolutionary point of view, attachments have adaptive value for babies, ensuring that their psychosocial as well as physical needs will be met.

For many years, developmental psychologists assumed the reason infants became attached to their parents was because their parents provided them with food. Food was either viewed as a primary reinforcer (within the learning theorists) or as satisfying a fundamental need (within psychoanalytic traditions). However, a series of experiments conducted by Harry Harlow (Harlow & Harlow, 1962), showed, in one fell swoop, that this view of attachment was incorrect.

In these experiments, baby rhesus monkeys were separated from their mothers 6 to 12 hours after birth. The infant monkeys were put into cages with two kinds of surrogate "mothers": a plain, cylindrical wire-mesh form that offered food and a form covered with terry cloth that offered nothing but a cuddly figure to cling to. The baby monkeys spent the majority of their time clinging to the terry-cloth mother.

None of the monkeys in either group grew up normally (Harlow & Harlow, 1962), and none was effectively able to nurture their own offspring (Suomi & Harlow, 1972). It is hardly surprising that a dummy mother would not provide the same kinds of stimulation and opportunities for positive development as a live mother. However, what is striking and important about these experiments was that they brought about a conceptual shift in the understanding of mothers. They showed that the previous model of mothering—that attachment resulted from an association with food—was fundamentally incorrect. Feeding is not the only, or even the most important, thing babies get from their mothers. Mothering includes the comfort of close bodily contact and, at least in monkeys, the satisfaction of an innate need to cling.

### attachment

Reciprocal, enduring tie between two people—especially between infant and caregiver—each of whom contributes to the quality of the relationship.



When you see a really cute baby, do you ever feel the urge to squeeze or pinch the baby? Researchers think this "cute aggression" helps regulate overwhelmingly positive emotions. The aggression balances the overwhelmingly positive emotions, allowing people to return to baseline sooner. The use of one emotion to regulate another is relatively frequent, as might be seen from people's common emotional responses to weddings, graduations, births...and of course, squeezing babies (Aragon et al., 2015).



*When infant monkeys could choose whether to go to a wire “mother” or a warm, soft, terry-cloth “mother,” they spent more time clinging to the cloth mother, even if their food came from the wire mother.*

Harlow Primate Laboratory, University of Wisconsin

#### Strange Situation

Laboratory technique used to study infant attachment.

Ainsworth's Strange Situation procedure has been modified for use in dogs (Solomon et al., 2018). Dogs can be securely or insecurely attached and use their caregivers as a secure base when under threat, such as when they see a scary stranger in a black coat, hat, and ski mask.

#### secure attachment

Pattern in which an infant is quickly and effectively able to obtain comfort from an attachment figure in the face of distress.

#### avoidant attachment

Pattern in which an infant rarely cries when separated from the primary caregiver and avoids contact on their return.

The pioneering ethologist John Bowlby (1978) knew of Harlow's seminal work. He also worked with children who had been separated from their parents by war and observed firsthand the devastating consequences such separation had on their development. Over time, he became convinced of the importance of the mother-baby bond, its deep evolutionary roots, its importance to multiple domains of healthy development, and the transmission of patterns across generations.

According to Bowlby, attachment styles are the result of repeated interactions with a caregiver. For example, if every time a baby cries the mother responds quickly and sensitively to that bid for comfort, over time the baby comes to expect it. By contrast, if a mother responds inconsistently to crying, babies form a very different set of expectations. Bowlby called these sets of expectations working models. As long as the mother continues to act the same way, the model holds up. If her behavior changes—not just once or twice but repeatedly—the baby may revise the model, and security of attachment may change. Because the working model emerges as a result of interactions between both partners in the relationship, babies can have different working models (and attachment styles) with different people. Later, the working model of this early relationship becomes the blueprint for other important relationships.

When the baby is near the attachment figure and feels safe, the baby feels free to explore the environment. When the baby feels threatened or scared, the baby approaches the attachment figure and seeks contact comfort—or being held or cuddled. Because a healthy attachment means a baby will feel secure more often and hence explore the environment more often, a secure working model of attachment should thus be associated with cognitive development.

**Studying Patterns of Attachment** The Strange Situation is a classic, laboratory-based technique designed to assess attachment patterns between an infant and an adult. Typically, the adult is the mother (though other adults have taken part as well), and the infant is 10 to 24 months old.

The Strange Situation consists of a sequence of episodes and takes less than half an hour. The episodes are designed to trigger the emergence of attachment-related behaviors. During that time, the mother twice leaves the baby in an unfamiliar room, the first time with a stranger. The second time she leaves the baby alone, and the stranger comes back before the mother does. The mother then encourages the baby to explore and play again and gives comfort if the baby seems to need it (Ainsworth et al., 1978).

When Ainsworth and her colleagues observed 1-year-olds in the Strange Situation and at home, they found three main patterns of attachment. These are secure attachment (the most common category, into which about 60 to 75 percent of low-risk North American babies fall) and two forms of anxious, or insecure, attachment: avoidant (15 to 25 percent) and ambivalent, or resistant (10 to 15 percent) (Vondra & Barnett, 1999). Security of attachment to father and mother is usually quite similar (Fox et al., 1991).

Babies with **secure attachment** are flexible and resilient in the face of stress. They sometimes cry when a caregiver leaves, but they quickly obtain the comfort they need once the caregiver returns. Some babies with secure attachment are comfortable being left with a stranger for a short period of time; however, they clearly indicate they prefer the caregiver to the stranger in the reunion episode, often smiling at, greeting, or approaching the caregiver. Babies with **avoidant attachment**, by contrast, are outwardly unaffected by a caregiver leaving or returning. They generally continue to play in the room and frequently interact with the stranger. However, upon the caregiver's return, they ignore or reject the caregiver, sometimes deliberately turning away. Avoidantly attached babies tend to show little emotion, either positive or negative. Babies who exhibit **ambivalent (resistant) attachment** are generally anxious even before the caregiver leaves, sometimes approaching the caregiver for comfort when the stranger

looks at or approaches them for interaction. They are extremely reactive to the caregiver's departure from the room and generally become very upset. Upon the caregiver's return, these babies tend to remain upset for long periods of time, kicking, screaming, refusing to be distracted with toys, and sometimes arching back and away from contact. They show a mix of proximity-seeking and angry behaviors and are very difficult to settle.

Note that in all of these cases, what the baby does during the caregiver's absence is not diagnostic of attachment categorization. What is diagnostic is what the babies do when the caregiver returns. The important component is the attachment relationship and how the babies use a caregiver to obtain comfort *while* in their presence.

These three attachment patterns are universal in all cultures in which they have been studied. Moreover, across a wide variety of different early life contexts, including WEIRD and non-Western cultures, hunter-gatherer and pastoralist societies, and even in deprived contexts, babies show the same organized pattern of attachment behaviors (Mesman et al., 2016). Note that this does not mean no differences exist. For instance, although secure attachment is generally the largest category, the percentage of infants in each category varies (van IJzendoorn & Sagi, 1999).

Other research (Main & Solomon, 1986) later identified a fourth pattern, **disorganized-disoriented attachment**. Babies with the disorganized pattern seem to lack a cohesive strategy to deal with the stress of the Strange Situation. Instead, they show contradictory, repetitive, or misdirected behaviors (such as seeking closeness to the stranger instead of the mother or showing a fear response upon the caregiver's entry). They seem confused and afraid (van IJzendoorn et al., 1999).

Disorganized attachment is thought to occur in at least 10 percent of low-risk infants but in much higher proportions in certain at-risk populations, such as babies with mothers who are insensitive, intrusive, or abusive; who are fearful; or who have suffered unresolved loss or have unresolved feelings about their childhood attachment to their own parents. Disorganized behaviors are also more common in infants who have undergone major or repeated separations from their primary caregivers. Disorganized attachment in infancy is predictive of later behavioral and adjustment problems (Granqvist et al., 2017).

### Stranger and Separation Anxiety

Chloe used to be a friendly baby, smiling at strangers and going to them, continuing to coo happily as long as someone—anyone—was around. Now, at 8 months, she turns away when a new person approaches and howls when her parents try to leave her with a babysitter. Chloe is experiencing both **stranger anxiety**, wariness of a person she does not know, and **separation anxiety**, distress when a familiar caregiver leaves her.

Babies rarely react negatively to strangers before age 6 months, commonly do so by 8 or 9 months, and do so more and more throughout the rest of the 1st year (Sroufe, 1997). Bowlby believed this was an adaptive process. Once babies can crawl, they can get away from their attachment figures and

Sensitive mothering is related to another important developmental achievement, at least in the eyes of parents. Mothers who respond sensitively to their infants end up with babies who fall asleep faster, sleep longer, and wake less often (Teti et al., 2010).

Babies, at least when they are themselves down on the ground, respond more negatively to tall strangers than to short strangers (Weinraub & Putney, 1978).



Both this father and baby contribute to the attachment relationship by the way they act toward each other. The way the baby molds herself to her father's body shows her trust and reinforces her father's feelings for her, which he displays through sensitivity to her needs.

Noriko Cooper/digitalskill/123RF

### ambivalent (resistant) attachment

Pattern in which an infant becomes anxious before the primary caregiver leaves, is extremely upset during their absence, and both seeks and resists contact on their return.

### disorganized-disoriented attachment

Pattern in which an infant, after separation from the primary caregiver, shows contradictory, repetitive, or misdirected behaviors on their return.

### stranger anxiety

Wariness of strange people and places, shown by some infants during the second half of the 1st year.

### separation anxiety

Distress shown by someone, typically an infant, when a familiar caregiver leaves.



*Maria's reluctance to allow her mother's friend to hold her is a sign of stranger anxiety.*

Christina Kennedy/Alamy Stock Photo

perhaps into danger. Evolution thus built in this wariness to keep them close to attachment figures and hence safety.

Research with American, Ugandan, Ladino and Mayan Guatemalan, Israeli, Kalahari !Kung, and Navaho infants has shown a similar emergence and pattern of separation anxiety and protest peaking at about a year of age (Ainsworth et al., 1978; Kagan, 1976; Chisholm, 2017; Lester et al., 1974). However, the timeline can vary slightly with cultural and individual factors. One key cultural influence appears to be how accustomed to being separated from the attachment figure a child is. The greatest degree of separation protest is exhibited by children who either are very frequently or almost never separated from their attachment figure (Jacobson & Wille, 1984). For example, infants raised in an Israeli kibbutz, who at 6 weeks are moved into an infant home and cared for by professional caregivers at night, show more separation distress than infants raised in the home with their parents (Sagi et al., 1991). And Guatemalan infants showed an earlier onset of separation protest than American infants, perhaps because they tended to live in small, one-bedroom homes and thus were infrequently separated from their mothers (Lester et al., 1974).

**Long-Term Effects of Attachment** As attachment theory proposes, security of attachment seems to affect emotional, social, and cognitive competence, presumably through the action of internal working models. A meta-analysis including over 80 studies and 4,000 children concluded that attachment security in infancy is associated with peer competence across childhood and early adolescence, whereas insecurity, regardless of subtype, is associated with lower peer competence (Groh et al., 2014).

Securely attached toddlers tend to have larger, more varied vocabularies than those who are insecurely attached (Meins, 1998), and in preschool, these children use more words reflecting mental states (McQuaid et al., 2008). They show less stress in adapting to child care (Ahnert et al., 2004), which may explain why they are also less likely to suffer from chronic health issues (Mäntymäa et al., 2003). They have more positive interactions with peers, and their friendly overtures are more likely to be accepted (Fagot, 1997). Insecurely attached toddlers tend to show more negative emotions (fear, distress, and anger), whereas securely attached children are more joyful (Kochanska, 2001).

Between ages 3 and 5, securely attached children are likely to be more curious, competent, empathic, resilient, and self-confident; to get along better with other children; and to form closer friendships than children who were insecurely attached as infants (Elicker et al., 1992; Jacobson & Wille, 1986; Youngblade & Belsky, 1992). They interact more positively with parents, preschool teachers, and peers; are better able to resolve conflicts; and tend to have a more positive self-image (Elicker et al., 1992; Verschueren et al., 1996; Sroufe et al., 2005). In middle childhood and adolescence, securely attached children tend to have the closest, most stable friendships and to be socially well adjusted (Sroufe et al., 1993). Secure attachment in infancy also influences the quality of attachment to a romantic partner in young adulthood (Simpson et al., 2007).

Insecurely attached children, in contrast, often are more likely to have inhibitions and negative emotions in toddlerhood, hostility toward other children at age 5, and dependency during the school years (Calkins & Fox, 1992; Fearon et al., 2010; Kochanska, 2001; Lyons-Ruth et al., 1993; Sroufe et al., 1993). They also are more likely to show evidence of externalizing behaviors such as aggression and conduct problems. This appears to be more true for boys, for clinically referred children, and when the attachment assessments are based on observational data (Fearon et al., 2010). Those with disorganized attachment are more likely to have behavior problems at all levels of schooling and psychiatric disorders at age 17 (Carlson, 1998). As adults, individuals who were insecurely attached as infants are also more likely to have cognitive vulnerabilities tied to depression (Morley & Moran, 2011).

**Intergenerational Transmission of Attachment Patterns** The Adult Attachment Interview (AAI) (George et al., 1985) asks adults to recall and interpret feelings and experiences related to their childhood attachments. Studies using the AAI have found that the way adults recall early experiences with parents or caregivers is related to their own children's attachment styles (Behrens et al., 2016). The intergenerational transmission of attachment patterns exists most strongly for the distinction between the secure and insecure (i.e., avoidant and resistant) profiles but holds across at least three generations (Shah et al., 2010).

Attachment history influences how parents interact with their children. For instance, a mother who was securely attached to her mother or who understands why she was insecurely attached can accurately recognize the baby's attachment behaviors, respond encouragingly, and help the baby form a secure attachment to her. Mothers who are preoccupied with their past attachment relationships tend to show anger and intrusiveness in interactions with their children, and depressed mothers who dismiss memories of their past attachments tend to be cold and unresponsive to their children (Adam et al., 2004).

Parents' attachment history also influences their perceptions of their baby's temperament, and those perceptions may affect the parent-child relationship (Pesonen et al., 2003). Some of these processes may occur outside of awareness at a physiological level. For example, when viewing their own infant's smiling face, mothers who reported a secure attachment style on the AAI showed greater activation in areas of the brain (hypothalamus/pituitary and ventral striatum) associated with reward, as well as release of oxytocin (a neurohormone involved in social processes), whereas mothers with insecure or dismissing styles did not. The differences while viewing their own infants' sad faces were even more striking. Here, mothers with a secure AAI style continued to show activation in reward areas, whereas mothers with insecure/dissmissing styles showed activation in areas (ventral striatum) more closely associated with feelings of pain or disgust (Strathearn et al., 2009). Additional research has found that adults with insecure attachment representations also show greater amygdala and left inferior frontal gyrus activation and respond with more irritation, greater activation of inhibitory processes, and more vigilance than do securely attached adults to infants (Ran & Zhang, 2018; Riem et al., 2012).

Fortunately, the cycle of insecure attachment can be broken. Interventions that focus on maternal sensitivity—teaching mothers to more accurately “read” their babies’ emotional signals—are effective in influencing infants’ security (Letourneau et al., 2015).

## MUTUAL REGULATION

At 1 month, Max gazes attentively at his mother’s face. At 2 months, when his mother smiles at him and rubs his tummy, he smiles back. By 3 months, Max smiles first, inviting his mother to play.

The ability of both infant and caregiver to respond appropriately and sensitively to each other’s mental and emotional states is known as **mutual regulation**. Ideally, caregivers and infants have high **interactional synchrony**—in which both unconsciously coordinate their behavior and affect in a rhythmic back-and-forth manner, responding appropriately and effectively to each other’s signals in an interactive dance. Infants take an active part in this by sending behavioral signals, such as smiling, that influence the way caregivers behave toward them. There are some suggestions that during the first month of life, this process is universal. In the 2nd and 3rd months of life, cultural differences, such as the degree of eye contact made with a baby and how much face-to-face contact is typical, affect the developmental course of interactional synchrony (Kärtner et al., 2010).

Interactional synchrony in 2- to 9-month-old infants is measured using the **still-face paradigm** (Tronick et al., 1978). First, the mother interacts in a normal fashion in order to establish a baseline of behaviors. Then, in the still-face episode, the mother suddenly becomes stony-faced, silent, and unresponsive, avoiding eye contact. During the still-face episode, infants tend to stop smiling and looking at the mother. They may make faces, sounds, or gestures, often in an attempt to draw the mother’s attention, and they express more negative affect and may arch up or squirm. They may touch themselves, their clothing, or a chair, apparently to comfort themselves or to relieve the emotional stress the mother’s unexpected behavior created. In essence, they become dysregulated (Mesman et al., 2009).

## checkpoint can you . . .

- Describe four patterns of attachment?
- Discuss how attachment is established, including the role of the baby’s temperament?
- Discuss factors affecting stranger anxiety and separation anxiety?
- Describe long-term behavioral influences of attachment patterns and intergenerational transmission of attachment?

### mutual regulation

Process by which infant and caregiver communicate emotional states to each other and respond appropriately.

### interactional synchrony

The synchronized coordination of behavior and affect between a caregiver and an infant.

### still-face paradigm

Experimental methodology in which a parent first interacts typically with their child, then keeps their face still and expressionless, and then ends with a return to typical behavior; used to demonstrate interactional synchrony.



Infants show the same response to the still-face procedure over a mobile phone as they do in person (Stockdale et al., 2020).

Typically, interaction shifts between well-regulated states and poorly regulated states. When an interaction is highly synchronous, the baby tends to be joyful or at least interested (Lowe et al., 2012; Tronick, 1989). However, when a mother or caregiver is not synchronous in her interaction with the baby—for example, if an invitation to play is ignored or an adult is overly intrusive—the baby generally becomes stressed or physiologically aroused (Conradt & Ablow, 2010). From this process, babies learn how to send signals and what to do when their signals are not effective.

Some aspects of interactional synchrony may be expressed at a biological level. For example, when mothers and infants are interacting face-to-face in a synchronous fashion, their heart rates become synchronized with lags of less than 1 second. This process does not occur during asynchronous periods of interaction (Feldman et al., 2011). Moreover, heart rate also varies systematically with infant regulatory patterns characteristic of the different infant attachment styles (Barbosa et al., 2018). Additionally, the release of oxytocin, a hormone related to bonding processes in mammals, has been found to be related to parenting behaviors in humans. In fathers, oxytocin levels are related to playful behaviors. In mothers, oxytocin levels are related to positive affect, affectionate touch, and “baby talk”—all markers of sensitive parenting (Gordon et al., 2010).

Young children whose mothers are high in interactional synchrony are more likely to be securely attached (Barbosa et al., 2020). They are also more likely later to be better at regulating their behavior and complying with parental requests; to have higher IQs and perform better on a variety of cognitive tasks; to have fewer behavioral problems, better school adjustment, and higher-quality play; and to show more empathy in adolescence (Feldman, 2007; Leclère et al., 2014). It may be that mutual regulation processes help them learn to read others’ behavior and to respond appropriately.

## SOCIAL REFERENCING

Ann toddles warily toward the new playground and stops at the entrance, staring at the laughing, screaming children scaling the bright structure. Unsure of herself, she turns toward her mother and makes eye contact. Her mother smiles at her, and Ann, emboldened by her mother’s response, walks in and starts to climb the structure.

When babies look at their caregivers on encountering an ambiguous event, they are engaging in **social referencing**, seeking emotional information to guide behavior. In social referencing, one person forms an understanding of how to act in an ambiguous, confusing, or unfamiliar situation by seeking and interpreting another person’s perception of it.

Infants show evidence of social referencing by 5½ months of age—but only if they are provided with both auditory and visual information (Vaillant-Molina & Bahrck, 2012). As children age, their use of social referencing becomes more sophisticated, and they become less dependent on facial expression. For example, at 12 months, toddlers can use either a facial expression or vocal tone as a cue to the safety of an action but respond more quickly to voice (Vaish & Striano, 2004). At 14 months, they avoid touching a plastic creature dropped within their reach if an adult expressed negative emotions toward it an hour earlier (Hertenstein & Campos, 2004). Additionally, while younger infants tend to check in with adults regardless of what type of stimulus they encounter, older infants tend to check in only when a stimulus or situation is ambiguous (Kim & Kwak, 2011). Children also become pickier about whom they seek information from. Between the ages of 4 and 5 years, they are more likely to trust information that comes from their mother than from a stranger (Corriveau et al., 2009). Moreover, infants are also more likely to look use social referencing with adults who have previously responded contingently to them (Sternberg, 2017).

Although cross-cultural research specifically focused on social referencing has not been undertaken, research on closely related developmental achievements, such as pointing and gaze following, suggests that social referencing is likely to be a cultural universal (Fawcett & Liszkowski, 2015). Social referencing, and the ability to retain information gained from it, may play a role in such key developments of toddlerhood as the rise of self-conscious emotions (embarrassment and pride), the development of a sense of self, and the processes of socialization and internalization, to which we turn in the Development Issues in Toddlerhood section.

### **social referencing**

Understanding an ambiguous situation by seeking another person’s perception of it.

Babies use social referencing for abstract stimuli such as music as well (Fawcett & Kreutz, 2021).



### checkpoint can you . . .

- Describe how mutual regulation works and explain its importance?
- Give examples of how infants seem to use social referencing?

# Developmental Issues in Toddlerhood

In this section, we look at the emerging sense of self, the growth of autonomy, and socialization processes.

## THE EMERGING SENSE OF SELF

The **self-concept** is our image of ourselves—our total picture of our abilities and traits. It describes what we know and feel about ourselves and guides our actions (Harter, 1996).

By 3 months, infants pay more attention to their mirror image than to images of others (Courage & Howe, 2002), but at about 4 months, babies begin to show more interest in images of others than of themselves (Rochat & Striano, 2002). Moreover, when looking at other faces, they prefer to look at faces of their own ethnicity. However, at this age, there is no evidence they understand race. Rather, infants prefer to look at the same types of faces they habitually see. So, for example, White babies exposed to predominantly White faces prefer White faces (Kelly et al., 2005), and Chinese babies exposed to predominantly Chinese faces prefer Chinese faces (Kelly et al., 2007).

At 6 months, although infants look at both own- and other-race faces equally (Liu et al., 2015), they look longer at own-race faces when they are shown with happy music and other-race faces when they are shown with sad music, implying they now associate positive emotions with particular types of faces (Xiao et al., 2018). At about 9 months, babies can categorize faces on the basis of race and become better at recognizing people of their own race (Quinn et al., 2016). They also begin to look longer at other-race faces (Liu et al., 2015), perhaps because their increasing sophistication allows them to process own-race faces more rapidly and thus allows more time exploring other-race faces (Lee et al., 2018). Overall, it appears that recognition of own- versus other-race faces is not just a perceptual process but is linked with emotional content and gradually refined over time.

The emergence of self-awareness builds on this dawning of perceptual distinction between self and others. In a classic line of research, investigators dabbed rouge on the noses of 6- to 24-month-olds and sat them in front of a mirror. Three-fourths of 18-month-olds and all 24-month-olds touched their red noses more often than before, whereas babies younger than 15 months never did. This behavior suggests that these older toddlers had self-awareness. They knew they did not normally have red noses and recognized the image in the mirror as their own (Lewis, 1997).

Children from individualistic, autonomy-supporting cultures, such as German and Indian urban samples, recognize themselves in a mirror earlier than do children from collectivistic cultures stressing relatedness and interactional goals, such as Indian and Nso rural samples (Kärtner et al., 2012). Moreover, research with young children from a variety of cultures, including the United States, Canada, Germany, Cameroon, Costa Rica, Greece, Kenya, Fiji, Santa Lucia, Grenada, and Peru, showed wide variability in performance on the mirror self-recognition task, although it was not always clear what their behaviors illustrated. For example, children from Kenya, who rarely passed the mirror self-recognition test, were more likely to freeze at the sight of their image rather than reach for their noses. Cameroonian children, who were generally highly compliant, might have resisted touching their nose as a result of assuming the rouge had been placed there on purpose by an adult (Broesch et al., 2011; Keller et al., 2005; Keller et al., 2004).

Another sign of self-recognition is the use of first-person pronouns, such as *me* and *mine*, usually at 20 to 24 months (Lewis & Carmody, 2008). A positive correlation between the usage of pronouns and mirror self-recognition has been found cross-culturally (Kärtner et al., 2012). Between 19 and 30 months, children begin to apply descriptive terms (*big* or *little*) and evaluative terms (*good*, *naughty*, or *strong*) to themselves. The rapid

### self-concept

Sense of self; descriptive and evaluative mental picture of one's abilities and traits.



Dabbing rouge on children's noses is known as the Rouge Task, and research has shown that dolphins, chimpanzees, and elephants also share our ability for self-recognition. Giant pandas, however, do not (Ma et al., 2015).



Four- to 9-month-olds show more interest in images of others than in images of themselves.  
Zdravko/Shutterstock

# research in action

## CULTURAL CONSIDERATIONS IN THE DIAGNOSIS OF AUTISM SPECTRUM DISORDER

Autism spectrum disorder (ASD) is a classification used by mental health professionals to describe a collection of differences in and difficulties with social skills development, communication, and behavior. ASD is common in the United States, affecting 1.7% of children (Hyman et al., 2020). When diagnosing children with ASD, providers look for children 3 and younger whose language skills were delayed or developed as expected but then suddenly reversed course (American Psychiatric Association, 2013, p. 50). The same timeline is used when assessing specific social skills (e.g., eye contact, sharing, pointing) and restricted interests or repetitive play, such as lining toys up in rows, rather than typical play. The most important box to tick is whether these differences are interfering with everyday functioning and development.

Because the development of ASD is shaped by social communication and behavior, an autistic child's experience can be heavily influenced by culture (American Psychiatric Association, 2013). This is important because the diagnostic tools are based on mostly US-specific, White, middle-class cultural expectations about behavior and communication, and providers must rely on parents to describe their child's difficulties. Not surprisingly, these tests have been found to have different scores across cultural groups in other countries, possibly affecting diagnosis (Matson et al., 2011). For example, one of the diagnostic items reported by parents is "maintains eye contact." Given that different cultures have different beliefs about the appropriateness of direct eye contact between children and adults,

it is likely this item would be interpreted differently by adults from different cultures. Issues such as this could mean the difference between a child receiving important early intervention services or not. With almost 2 percent of children needing services for ASD and more than 50 percent of children in the US identifying as racially, ethnically, or linguistically (REL) diverse, this is a big problem that needs a solution.

Ideally, psychologists need a guidebook to amend diagnosis and care to fit REL-diverse youth (Stoll et al., 2021). Some argue that because assessment is based strongly on the majority culture, tests should be checked for hidden biases or used with caution with REL-diverse children (Harrison et al., 2017; Rea et al., 2019). Other scholars have critiqued the research on interventions such as Applied Behavior Analysis for failing to adequately address culture, as well as suggested a path to closing this gap (Fong et al., 2017; Wright, 2019). The path is increasing awareness and conducting robust research into the instruments, the interventions, and, indeed, how providers think. It will take efforts from psychologists everywhere to be sure REL-diverse children with ASD receive the support they need to thrive.



What other types of behaviors do you think might be interpreted differently by parents from different countries? Are there other psychological conditions that might be diagnosed differently across different cultures?

development of language enables children to think and talk about the self and to incorporate parents' verbal descriptions ("What a hard worker!") into their emerging self-image (Stipek et al., 1990). This process is interactive; children who attain self-recognition earlier also comprehend and label more body parts (Waugh & Brownell, 2015). Toddlers of this age also demonstrate self-understanding through acknowledging objects that belong to them ("Mine!") and those that belong to others (Fasig, 2000).

Brain maturation underlies the development of self-representation. For example, infants who do and do not recognize their faces show different patterns of brain wave activity in response to photos of their own and others' faces (Stapel et al., 2017). Other work has demonstrated 18-month old toddlers who pass the mirror task show more fronto-parietal connectivity than those who do not pass the task (Bulgarelli et al., 2019). Additionally, magnetic resonance imaging (MRI) scans of 15- to 30-month-olds showed that signal intensities in a specific brain region, the left temporo-parietal junction, were strongest in children, regardless of age, who recognized their image in a mirror, engaged in pretend play with others, and used personal pronouns (Lewis & Carmody, 2008). Last, research shows differences in the brains of children with autism, who are generally delayed in their ability to recognize themselves in a mirror (Uddin, 2011; Research in Action).

## DEVELOPMENT OF AUTONOMY

Erikson (1950) identified the period from about 18 months to 3 years as the second stage in personality development, **autonomy versus shame and doubt**, which is marked by a shift from external control to self-control. The virtue that emerges during this stage is will. Toilet training is an important step toward autonomy and self-control; so is language. As children are better able to make their wishes known, they become more powerful. Because unlimited freedom is neither safe nor healthy, said Erikson, shame and doubt have a necessary place. Toddlers need adults to set appropriate limits, and shame and doubt help them recognize the need for those limits.

In the United States, this growing sense of autonomy is sometimes called the “terrible twos.” This drive typically shows itself in the form of negativism, that is, the tendency to shout “No!” just for the sake of resisting authority. Many US parents might be surprised to hear that the terrible twos are not universal (see Window on the World).

## MORAL DEVELOPMENT AND SOCIALIZATION

**Socialization** is the process by which children develop habits, skills, values, and motives that make them responsible, productive members of society. Compliance with parental expectations can be seen as a first step toward compliance with societal standards. Socialization rests on **internalization** of these standards. Children who are successfully socialized no longer obey rules or commands merely to get rewards or avoid punishment; rather, they have internalized those standards and obey societal or parental dictates because they believe them to be right and true.

**Developing Self-Regulation** Laticia, age 2, is about to poke her finger into an electric outlet. When Laticia hears her father shout, “No!” the toddler pulls her arm back. The next time she goes near an outlet, she starts to poke her finger, hesitates, and then says, “No.” She is beginning to show **self-regulation**: control of her behavior to conform to a caregiver’s demands or expectations of her, even when the caregiver is not present.

Self-regulation is the foundation of socialization, and it links physical, cognitive, emotional, and social domains of development. Until Laticia was physically able to get around on her own, electric outlets posed no hazard. To stop herself from poking her finger into an outlet requires that she consciously remember and understand what her father told her. Cognitive awareness, however, is not enough; restraining herself also requires emotional control and understanding as children continually absorb information about what conduct their parents approve of. Moreover, the quality of their relationship with their parents affects this emerging skill. Maternal sensitivity, parents’ tendency to use mental terms when talking to the child, and support of the child’s autonomous behavior are all important influences on self-regulation (Bernier et al., 2010).

Another important influence involves attentional processes. Before they can control their own behavior, children need to be able to regulate, or control, their attentional processes and to modulate negative emotions (Eisenberg, 2000). Attentional regulation enables children to develop willpower and cope with frustration (Sethi et al., 2000). For example, control of attentional processes might allow a child to distract themselves enough that they manage not to steal the cookies temptingly cooling on the counter.

The growth of self-regulation parallels the development of the self-conscious and evaluative emotions, such as empathy, shame, and guilt (Lewis, 1995). It requires the ability to wait for gratification. It is correlated with measures of conscience development, such as resisting temptation and making amends for wrongdoing (Eisenberg, 2000). In most children, the full development of self-regulation takes at least 3 years (Rothbart et al., 2011).

**Cultural Influences on Self-Regulation** Most of the research conducted on the development of self-regulatory capacities in children has focused on European American families. However, cultural values affect key processes that impact self-regulation (LeCuyer & Zhang, 2015). One study comparing Israeli (an individualistic culture) and Palestinian

### autonomy versus shame and doubt

Erikson's second stage in psychosocial development, in which children achieve a balance between self-determination and control by others.

### checkpoint can you... ...

- Trace the early development of the self-concept?
- Describe the conflict of autonomy versus shame and doubt and explain why the terrible twos is considered a normal phenomenon?

### socialization

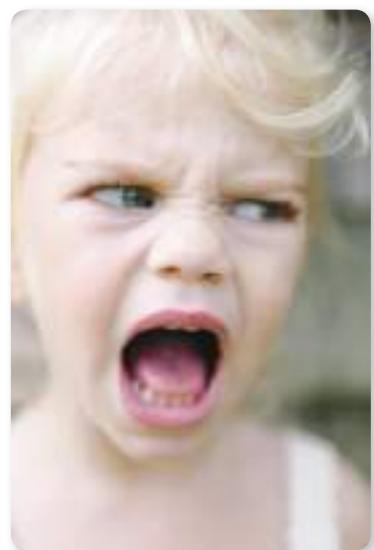
Development of habits, skills, values, and motives shared by responsible, productive members of a society.

### internalization

During socialization, process by which children accept societal standards of conduct as their own.

### self-regulation

A child's independent control of behavior to conform to understood social expectations.



*Learning to control your temper is a form of self-control.*

Steve Wisbauer/Digital Vision/Getty Images



## THE TERRIBLE TWOS MIGHT NOT BE THAT BAD

Are the “terrible twos” a normal phase in child development? Although many Western parents and psychologists think so, this transition does not appear to be universal.

A cross-cultural study compared 16 Mayan families in San Pedro, Guatemala, with 16 American families in Salt Lake City, Utah (Mosier & Rogoff, 2003). Each family had toddlers 14 to 20 months old and older children 3 to 5 years old. With the parents and both siblings present, the researchers handed the mother a series of toys (such as a puppet on strings). In the presence of the older sibling, the researchers asked the mother to help the toddler operate the toys. Researchers found striking differences in the way siblings interacted in the two cultures and in the way the mothers viewed and handled sibling conflict.

The older American siblings often tried to take and play with the toys themselves without regard for their younger sibling. By contrast, the older Guatemalan children would often offer to help their younger siblings, or the two children would play with the toys together. When there was a conflict over possession of the toys, the Guatemalan mothers favored the toddlers 94 percent of the time, even taking an object away from the older child if the younger child wanted it. When mothers asked, the older siblings willingly gave the objects to the toddlers or let them have the objects from the start. However, in more than one-third of the American families, the mothers treated both children equally, negotiating with them or suggesting they take turns or share.

What explains these cultural contrasts? A clue emerged when the mothers were asked at what age children can be held responsible for their actions.

Most of the American mothers maintained that by age 1, their toddlers already understood the consequences of their actions. Yet all but one of the San Pedro mothers placed the age of understanding consequences of actions much later, between 2 and 3 years of age. The American mothers regarded their toddlers as capable of intentional misbehavior and punished them for it; most Guatemalan mothers did not.

The researchers suggest that the terrible twos may be a phase specific to societies that place individual freedom before the needs of the group. In societies that place higher value on group needs, freedom of choice exists, but interdependence, responsibility, and expectations of cooperation are more important. American parents seem to believe that responsible behavior develops gradually from engaging in fair competition and negotiations. Guatemalan parents seem to believe that responsible behavior develops rapidly when children are old enough to understand the need to respect others’ desires as well as their own. Thus, the terrible twos are not universal.



Given what you just learned about how Mayan and American adults view toddlers, what might you predict about how much adults in each culture worry when young children are around dangerous objects such as knives or open flames? In which culture might adults be more likely to think young children would understand the dangers at an earlier age?

(a collectivistic culture) parent-child pairs found that although self-regulation abilities emerged at roughly the same age in all toddlers, the predictors varied by culture. In the Israeli families, the children who received the most face-to-face contact were the best self-regulators; in the Palestinian families, the children who had more close physical contact with their parents were the best self-regulators. In other words, optimal parenting differed by culture (Feldman et al., 2006). Similarly, cross-cultural studies suggest authoritative parenting is best suited for children from European and Western countries, authoritarian parenting is more effective with Asian and Latin American children, and permissive parenting may work well for children from Spain (Jaramillo et al., 2017).

Another way in which culture influences socialization is via beliefs about the self. In individualistic countries, the self is viewed as distinct, and independence is valued. Thus, socialization goals focus on the development of autonomy and the fulfillment of personal

goals. However, in collectivistic cultures, the self is viewed as interdependent with others. Therefore, much of parental socialization focuses on the preservation of social harmony (Trommsdorff et al., 2012).

These different conceptions of the nature of the self then lead to different approaches and outcomes of socialization. In individualistic countries, children are socialized to develop primary control, where the individual self is viewed as static. Control efforts focus on changing the environment to better conform to the individual. So, for example, a child wanting to play with a desired toy being used by another child might try to negotiate with that child to get the toy for themselves. In collectivistic countries, children are socialized for secondary control, where the individual is viewed as changeable and the world as static. So, in the same situation, a child from a collectivistic culture might decide to try to find a different toy to make themselves happy or convince themselves they did not really want to play with it after all (Rothbaum & Wang, 2010).

**Developing a Conscience** The eventual goal of socialization is the development of a **conscience**, which involves both the ability to refrain from certain acts as well as to feel emotional discomfort for failing to do so.

Kochanska and her colleagues looked for the origins of conscience in a longitudinal study of 103 children ages 26 to 41 months and their mothers playing together with toys (Kochanska & Aksan, 1995). After a free-play period, a mother would give her child 15 minutes to put away the toys. The laboratory had a special shelf with other, unusually attractive toys, such as a bubble gum machine, a walkie-talkie, and a music box. The child was told not to touch anything on that shelf. After about an hour, the experimenter asked the mother to go into an adjoining room, leaving the child alone with the toys. A few minutes later, a woman entered, played with several of the forbidden toys, and then left the child alone again for 8 minutes.

Some children could put the toys away as long as their parents were there to remind them. These children showed what is called **situational compliance**. They needed the extra assistance provided by their parents' reminder and prompts to complete the task. In a different situation that did not include those reminders, these children might fail to put the toys away. However, other children seemed to have internalized their parents' requests more fully. These children showed **committed compliance**; that is, they were committed to following requests and could do so without their parents' direct intervention.

The roots of committed compliance go back to infancy. Committed compliers, most typically girls, tend to be those who, at 8 to 10 months, could refrain from touching when told "No!" (Kochanska et al., 1998). Mothers of committed compliers, as contrasted with mothers of situational compliers, were more sensitive and responsive with their children as infants (Kochanska et al., 2010) and, once the children were toddlers, tended to rely on gentle guidance rather than force, threats, or other forms of negative control (Kochanska et al., 2004). Committed compliance tends to increase with age, whereas situational compliance decreases.

**Receptive cooperation** goes beyond committed compliance. It is a child's eager willingness to cooperate harmoniously with a parent, not only in disciplinary situations but also in a variety of daily interactions, including routines, chores, hygiene, and play. Secure attachment and a warm, mutually responsive, parent-child relationship seem to foster committed compliance and conscience development (Kochanska et al., 2010). This is because children who have a secure attachment relationship trust in and have a positive orientation toward their parent. That, in turn, leads to a cascade of positive effects: A cooperative, willing child elicits supportive, responsive parenting, and these influences reciprocally interact over time (Goffin et al., 2018).

Constructive conflict over a child's misbehavior—conflict that involves negotiation, reasoning, and resolution—can help children develop a conscience by enabling them to see another point of view. In one observational study, 2-year-olds whose mothers explained why they were doing tasks, used noncontrolling language, and provided simple descriptions were more likely to comply with requests at 3½ years than children

#### conscience

Internal standards of behavior, which usually control one's conduct and produce emotional discomfort when violated.

#### situational compliance

Kochanska's term for obedience of a parent's orders only in the presence of signs of ongoing parental control.

#### committed compliance

Kochanska's term for wholehearted obedience of a parent's orders without reminders or lapses.

#### receptive cooperation

Kochanska's term for eager willingness to cooperate harmoniously with a parent in daily interactions, including routines, chores, hygiene, and play.

- ▶ Tell when and how self-regulation develops and how it contributes to socialization?
- ▶ Distinguish among committed compliance, situational compliance, and receptive cooperation?
- ▶ Discuss how temperament, attachment, and parenting practices affect socialization?

whose mothers had used threats, punishments, criticism, sarcasm, or bribes (Laurin & Joussemet, 2017).

There are also cultural differences. For example, Japanese mothers in one study patiently elicited cooperation from their toddlers with hints and questions, and avoided the use of reprimands. This was in line with a cultural belief that the positive nature of the relationship needed to be maintained for learning to occur. By contrast, Taiwanese mothers deliberately sought confrontations with their toddlers, believing these interactions to be an ideal opportunity to deliver moral lessons and provide explicit instructions on behavior (LeVine & LeVine, 2016).



*One new development in the parenting domain is the influence of instantly and always available technology. Research suggests that young children are increasingly experiencing hurt feelings as a result of competition with computers and smartphones for their parents' attention (Turkle, 2017).*

## Relationships with Other Children

Although parents exert a major influence on children's lives, relationships with other children—both in the home and out of it—also are important from infancy on.

### SIBLINGS

Research has shown that babies usually become attached to their siblings and can use them as a secure base and that their older siblings generally offer them comfort when they are distressed (Samuels, 1980; Stewart, 1983). Nevertheless, as babies begin to move around and become more assertive, they inevitably have conflict with siblings—at least in US culture. The earliest, most frequent, and most intense disputes among siblings are over property rights or access to the mother (Vandell & Bailey, 1992). Sibling conflict increases dramatically after the younger child reaches 18 months (Volling et al., 2010). During the next few months, younger siblings begin to participate more fully in family interactions. They begin to recognize what kind of behavior will upset or annoy an older brother or sister and what behavior is considered naughty or good (Recchia & Howe, 2009). Constructive conflict with siblings helps children recognize each other's needs, wishes, and point of view, and it helps them learn how to fight, disagree, and compromise within the context of a safe, stable relationship.

Despite the frequency of conflict, prosocial and play-oriented behaviors are more common than rivalry, hostility, and competition. Because older siblings tend to dominate younger ones, the quality of the relationship is more affected by the emotional and social adjustment of the older child than the younger one (Pike et al., 2005). Generally, same-sex siblings, particularly girls, are closer and play together more peacefully than boy-girl pairs (Kier & Lewis, 1998).

The quality of sibling relationships tends to carry over to relationships with other children. For instance, children with older siblings are better at inferring the mental states of others and in executive control skills (McAlister & Peterson, 2013). One longitudinal study of over 10,000 children found that kindergarteners and 5th graders with siblings had significantly better social skills than did children without siblings (Downey et al., 2015). Additionally, siblings who frequently play amicably together tend to develop prosocial behaviors (Pike et al., 2005).

This process is similar for negative influences. A child who is aggressive with siblings is likely to be aggressive with friends as well (Abramovitch et al., 1986). For example,

children who victimize their siblings are more likely to be bullied or to bully others, and children who are victimized by their siblings are more likely to be bullied (Tippett & Wolke, 2015).

In many cultures, including agrarian communities in Africa, Southeast Asia, the Pacific, and indigenous North America, young children are given the task of caring for their infant siblings (LeVine & LeVine, 2016). However, siblings are generally a secondary attachment, and babies prefer the attention of a primary caretaker, most commonly the mother, when truly distressed. Although there is sparse research available on sibling attachments in other cultures, what little exists suggests the same is true everywhere (LeVine et al., 1994).

## PEERS

Infants and—even more so—toddlers show interest in people outside the home, particularly people their own size. During the first few months, they look, smile, and coo at other babies (Field, 1978). From about 6 to 12 months, they increasingly smile at, touch, and babble to them (Hay et al., 1982). At about 1 year, babies offer objects to other babies, try to take objects away from them, make eye contact and smile, and touch or hit other babies (Williams et al., 2010). From about 1½ years to almost 3, children show growing interest in what other children do and an increasing understanding of how to deal with them (Eckerman, Davis, & Didow, 1989). Cooperative activity develops during the 2nd and 3rd years as social understanding grows (Brownell et al., 2006). As with siblings, conflict also can have a purpose: helping children learn how to negotiate and resolve disputes (Kramer, 2010).

Preschoolers usually like to play with children of the same age, sex, and gender (Martin et al., 2013). They also prefer prosocial playmates who can provide them with positive experiences (Paulus, 2017) and who are advanced in theory of mind (Slaughter et al., 2015). Preschoolers reject disruptive, demanding, intrusive, or aggressive children (Coelho et al., 2017; Roopnarine & Honig, 1985). As children become older, their preferences become more sophisticated, and they start focusing less on physical traits and more on characteristics such as doing things together, liking and caring for each other, and sharing and helping one another (Furman & Bierman, 1983). Beginning at about 4 years, children will start to conform to peer pressure and sometimes go along with the group, even when they disagree with an action (Haun & Tomasello, 2011).

Cultural differences in peer relationships abound. In Western countries, with their individualistic orientations, peer relationships are viewed as a way for children to develop autonomy from the family. In collectivistic societies, peer relationships are viewed more as a way for children to learn social standards and desired behaviors (Chen et al., 2014). For example, interactions in Asian and Latino child groups are generally more affiliative and cooperative, and children are likely to use greater self-control (Chen et al., 2006). Additionally, although children in developed countries such as the United States spend much of their time in organized play and often have little time for free, unstructured play, children in hunter-gatherer communities spend much of the day in unstructured playing and most often play in mixed-age groups out of necessity (Gray, 2011).

There are also cross-cultural commonalities. As in developed countries, young children in hunter-gatherer cultures segregate by gender. Research with Hadza children of Tanzania and the Bayaka of the Republic of Congo showed that children preferred to play with same-gender children when they were available and tended to play in ways that conformed to gender norms in their societies, often pretending to do gendered adult work (Lew-Levy et al., 2019). Additionally, cooperative games and conflictual interactions appear to be universal and have been documented in cultures as varied as the United States, Britain, Canada, Israel, Italy, and Papua New Guinea (Hay et al., 2018).



*In many non-Western cultures, it is common to see older siblings caring for younger siblings.*

Wigbert Roth/imageBROKER/Shutterstock

### checkpoint can you . . .

- Explain how sibling relationships play a part in socialization?
- Describe changes in sibling interactions during toddlerhood?
- Describe influences on peer relationships?

Although parents may feel guilty about how much time they spend with their children given the conflicting demands of work and family, research suggests that they actually spend more time with their kids than previous generations did (Ramey & Ramey, 2009). How do parents fit it in? Apparently, moms spend less time cooking and cleaning, and dads spend less time at work.



# Children of Working Parents

Parents' work determines more than the family's financial resources. Much of adults' time, effort, and emotional involvement goes into their occupations. How do their work and their child care arrangements affect infants and toddlers?

## EFFECTS OF MATERNAL EMPLOYMENT

Because there has not been much variability in paternal employment but women have increasingly joined the work force, most studies of the impact of parents' work on children's well-being have focused on employed mothers. In 1975, the US labor force participation rate of mothers with children was 47 percent (US Bureau of Labor Statistics, 2008). By 2020, 71.2 percent of US mothers worked either full- or part-time (US Bureau of Labor Statistics, 2021; Figure 2). However, the employment rate of women has declined as a result of the economic recession brought about by the COVID-19 pandemic. While unemployment has increased across many groups, the economic consequences disproportionately affected women, largely due to disruptions in child care and schooling (Bateman & Ross, 2020). From January 2020 to January 2021, the unemployment rate for women rose from 3.5 percent to 6.3 percent, representing the exit of some 2.5 million women from the workforce (US Bureau of Labor Statistics, 2021).

In general, the more satisfied a mother is with her employment status, the more effective she is likely to be as a parent. However, the impact of a mother's work depends on many other factors, including the child's age, sex, temperament, and personality; whether the mother works full-time or part-time; why she is working; whether she has a supportive or unsupportive partner, or none; the family's socioeconomic status; and the type of care the child receives before and/or after school (Gottfried & Gottfried, 2013).

Mothers are far more likely to take on part-time work than fathers (Weeden et al., 2016). All things being equal, children tend to do slightly better in school if one parent is able to work part-time (Goldberg et al., 2008). However, in the real world, all things are not equal. Although it is difficult to pin down the multiplicity of influences, longitudinal research indicates that overall, children from dual-earner families do well, and there are advantages, such as the increase in income, associated with having working parents (Gottfried & Gottfried, 2013).

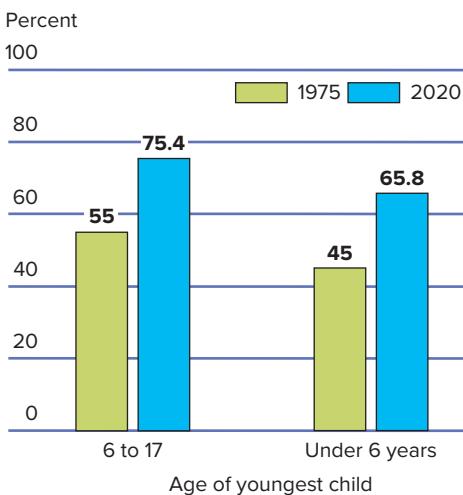
## EARLY CHILD CARE

The impact of early child care depends on a variety of factors, including the child's temperament and gender, the quality of care, and characteristics of the caregiver.

**Factors Having an Impact on Child Care** About 61 percent of American children under the age of 5 have some sort of regular child care arrangement. Of those children, 42 percent are cared for by relatives, primarily grandparents and fathers. About a third are regularly cared for by nonrelatives, and approximately 12 percent are cared for by a mix of relatives and nonrelatives. Approximately a quarter are cared for in some form of organized care facility (Laughlin, 2013). Child care is expensive: The average weekly rate in 2020 for toddler care in a center was \$340 (Care.com, 2021).

Temperament and gender of the child make a difference. Shy children in child care experience greater stress, as shown by cortisol levels, than sociable children (Watamura et al., 2003), and insecurely attached children experience greater stress than securely attached children when introduced to full-time child care (Ahnert et al., 2004). Boys are more vulnerable to stress, in child care and elsewhere, than are girls (Crockenberg, 2003).

A critical factor in determining the effects of child care is the quality of care a child receives. Quality of care can be measured by structural characteristics, such as staff training and the ratio of children to caregivers; and by process



**FIGURE 2**  
US Labor Force  
Participation Rates of  
Mothers with Own  
Children, 1975 and 2020

Labor force participation by mothers of children of all ages has increased dramatically.

Sources: Data from Hayghe (1986); US Bureau of Labor Statistics (2021).

characteristics, such as the warmth, sensitivity, and responsiveness of caregivers and the developmental appropriateness of activities. When children are enrolled in high-quality programs, they show positive changes in social conscience, decision making, critical thinking, academic outcomes, attachment to their school, peer relationships, and self-confidence, and they show declines in problem behaviors and drug use (Smischney et al., 2018; Durlak et al., 2010).

**Cultural Variations in Early Child Care** There are wide global variations in the proportion of children who attend preschool. In Western countries such as the United States, 83 percent of young children are enrolled in some form of preschool program. In low-income countries, only 22 percent of children are able to access this experience, and socioeconomic disparities within low-income countries mean poor children are 8 times less likely to be enrolled in preschool than are children from wealthy families. Only 12 percent of children in low-income countries who do not attend preschool will be on track for literacy and numeracy skills, as compared with 44 percent of their preschool-attending peers. Globally, half of preschool-age children—roughly 175 million—are not enrolled in preschool (UNICEF, 2019). The limited early childhood educational opportunities for many of these children perpetuate a cycle of poverty and inequality.

Preschools in different countries also vary with respect to their developmental goals and socialization practices. In some countries, such as the United States, play is viewed as essential for development, whereas hunter-gatherer cultures and Asian countries are more likely to view play as separate from developmental processes (Roopnarine, 2011). Not surprisingly, American preschools stress exploring the environment, having fun, and self-expression. By contrast, preschools in China, Japan, and France focus more closely on disciplined learning and following rules (Tobin et al., 1989; Tobin, 2005; Hess & Azuma, 1991).

## Child Maltreatment

Although most parents are loving and nurturing, some cannot or will not take proper care of their children, and some deliberately harm them. Maltreatment, whether perpetrated by parents or others, is deliberate or avoidable endangerment of a child.

Maltreatment can take several specific forms, and the same child can be a victim of more than one type (USDHHS, Administration on Children, Youth and Families, 2019). These types include the following:

- **Physical abuse**, injury to the body through punching, beating, kicking, or burning.
- **Neglect**, failure to meet a child's basic needs, such as food, clothing, medical care, protection, and supervision.
- **Sexual abuse**, any sexual activity involving a child and an older person.
- **Emotional maltreatment**, including rejection, terrorization, isolation, exploitation, degradation, ridicule, or failure to provide emotional support, love, and affection.

Globally, estimates are that approximately 3 in 4 children aged 2 to 4 years—approximately 300 million children—experience physical or psychological violence from their caregivers, with girls at higher risk for sexual violence than boys (World Health Organization, 2020). Multiple forms of abuse may exist in the same family (Kim et al., 2017).

In the United States, child protective service agencies received an estimated 4.4 million referrals for alleged maltreatment of 7.9 million children in 2018. Approximately a fifth of investigated children were found to be victims of abuse or neglect. About 75 percent of children were neglected, 17.5 percent were physically abused, and 9.3 percent were sexually abused. **Sex trafficking**, the recruitment, harboring, transportation, provision, or obtaining of a person for the purpose of a commercial sex act, was included in the reports for the first time in 2018. Victims of sex trafficking accounted for .01 percent of maltreatment cases. An estimated 1,840 children died of maltreatment, primarily as a result of neglect (USDHHS, 2021).



- Evaluate the impact of a mother's employment on her baby's well-being?
- Compare the impact of child care and of family characteristics on emotional, social, and cognitive development?

### physical abuse

Action taken deliberately to endanger another person, involving potential bodily injury.

### neglect

Failure to meet a dependent's basic needs.

### sexual abuse

Physically or psychologically harmful sexual activity or any sexual activity involving a child and an older person.

### emotional maltreatment

Rejection, terrorization, isolation, exploitation, degradation, ridicule, or failure to provide emotional support, love, and affection; or other action or inaction that may cause behavioral, cognitive, emotional, or mental disorders.

### sex trafficking

The recruitment, harboring, transportation, provision, or obtaining of a person for the purposes of a commercial sex act.

The COVID-19 pandemic has increased the risk of maltreatment for children as a result of increased stressors, including school closures, loss of income, parental anxiety and depression, and social isolation. Although the referral rates for the investigation of maltreatment and overall visits to the emergency room have declined, hospitalizations resulting from child abuse and neglect have not. In other words, children were less likely to be taken to emergency rooms overall, but when they were, they were more likely to have suffered the effects of maltreatment (Swedo et al., 2020).

If maltreatment is suspected, child protective services agencies investigate claims and determine what steps, if any, need to be taken. Services for abused children and their parents include shelters, education in parenting skills, and therapy (USDHHS, 2021). More than a fifth of child maltreatment victims are removed from their homes (USDHHS, 2021). Slightly under half of children who enter foster care are reunited with their families, and about a quarter are adopted (Child Welfare Information Gateway, 2021).

## MALTREATMENT IN INFANCY AND TODDLERHOOD

Children are abused and neglected at all ages, but the highest rates of victimization and of death from maltreatment are for age 3 and younger. Babies younger than a year of age account for 45.4 percent of child maltreatment fatalities, and children from 1 to 3 years of age account for another 30.9 percent (Children's Welfare Information Gateway, 2021; Figure 3).

Babies who do not receive nurturance and affection or who are neglected sometimes suffer from **nonorganic failure to thrive**, slowed or arrested physical growth with no known medical cause, accompanied by poor developmental and emotional functioning. Symptoms may include lack of appropriate weight gain, irritability, excessive sleepiness and fatigue, avoidance of eye contact, lack of smiling or vocalizing, and delayed motor development. In short, they neither grow nor develop normally despite an apparent lack of underlying physical or medical causes. Failure to thrive can result from a combination of inadequate nutrition, difficulties in breastfeeding, improper formula preparation or feeding techniques, and disturbed interactions with parents.

**Shaken baby syndrome** is a form of maltreatment found mainly in children under 2 years old, most often in infants. Because the baby has weak neck muscles and a large, heavy head, shaking makes the brain bounce back and forth inside the skull. This causes bruising, bleeding, and swelling and can lead to permanent and severe brain damage, paralysis, and even death. The damage is typically worse if the baby is thrown into bed or against a wall. Head trauma is the leading cause of death in child abuse cases in the United States (Dowshen et al., 2004).

**Characteristics of Abusive and Neglectful Parents** In 2019, the vast majority of perpetrators of child maltreatment—almost 80 percent—were the parent of a victim. Of the remainder, 6.4 percent of perpetrators were other relatives, and 4.2 percent were unmarried partners of parents. Slightly more than half (53.8 percent) were women. Most perpetrators were White (49.6 percent), African American (20.6 percent), or Hispanic (19.3 percent) (Children's Welfare Information Gateway, 2021). A disproportionate number of abused and neglected children are in large, poor, or single-parent families, which tend to be under stress and to have trouble meeting children's needs (USDHHS, 2021). When poverty rates rise, so too do child maltreatment rates. When matched for poverty levels, White families report the highest abuse rates and Hispanic families the lowest (Kim & Drake, 2018).

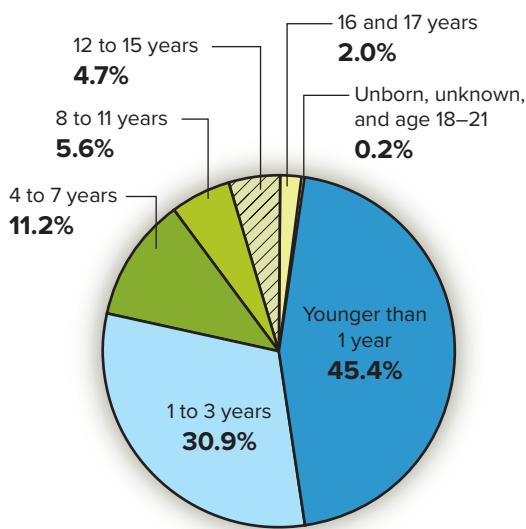
Although many neglect cases occur in very poor families, most low-income parents do not neglect their children. Parents who abuse children tend to use harsh or controlling parenting practices (Bugental et al., 2010). Moreover, they often have issues with intimate partner violence (Guedes &

### nonorganic failure to thrive

Slowed or arrested physical growth with no known medical cause, accompanied by poor developmental and emotional functioning.

### shaken baby syndrome

Form of maltreatment in which shaking an infant or toddler can cause brain damage, paralysis, or death.



**FIGURE 3**

### Deaths from Maltreatment by Age, 2019

Approximately three-quarters of fatalities are children younger than age 3.

Source: Child Welfare Information Gateway (2021).

Mikton, 2013). Substance abuse is a factor in approximately a third of cases of maltreatment (USDHHS, 2021).

**Cultural Influences** The interpretation of behaviors varies by cultures, and thus so do perceptions and reports of abuse and neglect. Still, there is some agreement: A review of 72 countries across major regions of the world showed most adults believed sexual or physical abuse by a caregiver, abandonment, and child prostitution should all be classified as maltreatment (International Society for the Prevention of Child Abuse and Neglect, 2008). However, what is considered good parenting in one culture may be considered neglect or abuse in another. Moreover, poverty and the availability of social and medical resources are contributing factors as well (Stoltenborgh et al., 2013).

A meta-analysis of 288 cross-cultural studies showed countries in Europe and Asia had lower rates of physical abuse, whereas countries in South America had higher rates. Additionally high-income countries had lower rates of neglect than did low- or middle-income countries. However, differing rates of physical abuse and neglect could be an artifact of cultural differences. In many countries, the use of physical force is a normative practice and is not seen as abuse (Viola et al., 2016). Similarly, in some countries, leaving infants and children in the care of young siblings is routine; in countries such as the United States, this would likely be considered neglectful (Korbin & Spilsbury, 1999).

Other important cultural values include the glorification of violence, rigid gender roles, and beliefs that diminish the status of the child within the parenting relationship, all of which increase the risk of maltreatment (World Health Organization, 2020). Attitudes on corporal punishment also seem to matter. Both within individual families in a culture and across different cultures, a belief that corporal punishment is necessary and normative is associated with a greater likelihood of its use and a consequently greater risk of abuse and neglect (Lansford et al., 2015).

In the United States, homicide, domestic violence, and rape are common, and many states still permit corporal punishment in schools. Although the use of corporal punishment, overall, has been trending down in recent decades, almost half of parents of children 9 years and younger spank their children, with the use of spanking escalating at approximately 2 years of age and peaking at ages 3 to 4 years (Finklehor et al., 2019). By contrast, in countries where violent crime is infrequent and children are rarely spanked, such as Japan, China, and Tahiti, child abuse is rare (Celis, 1990).

## LONG-TERM EFFECTS OF MALTREATMENT

Long-term consequences of maltreatment may include physical, psychological and behavioral consequences that may persist across generations. Some children with a history of maltreatment show reduced brain volume and irregularities in the development of their amygdalae (which processes strong emotions), hippocampus (involved in learning and memory), frontal cortex (involved in executive control), cerebellum (coordination of motor behavior), and corpus callosum (involved in the communication between hemispheres).

As adolescents, maltreated children are more likely to engage in risky sexual activity, juvenile delinquency, and alcohol and drug use. As adults, they are more likely to be involved in criminal activities and are at higher risk of themselves later maltreating their own children and thus perpetuating the cycle of abuse (Child Welfare Information Gateway, 2019). Moreover, adult survivors of child maltreatment report a lower quality of life (Weber et al., 2016) and poorer health as adults, including a higher incidence of heart disease, cancer, chronic lung disease, and liver disease (Chartier et al., 2010; Levine et al., 2017).

Despite elevated risk, many maltreated children show remarkable resilience. Optimism, self-esteem, intelligence, creativity, humor, and independence are protective factors. Another key factor may be the social support of a caring adult (Levine et al., 2017; Child Welfare Information Gateway, 2019). Just as a dysfunctional, abusive relationship may pull a young child's developmental trajectory in a negative direction, a supportive, loving relationship with a different adult may buffer that child from the storms of a difficult childhood.



*There are short-term risks from child maltreatment as well. Even preschool children can experience episodes of clinical depression, although it may look a bit different than it does in adults. For example, depressed preschool children may have episodes of normal functioning interspersed with periods of sadness or irritation throughout the day.*

### checkpoint can you . . .

- Define four types of child abuse and neglect?
- Identify contributing factors to maltreatment?
- Cite ways to prevent or stop maltreatment and help its victims?
- Give examples of long-term effects of child abuse and neglect and of factors that promote resilience?

# summary and key terms

## Foundations of Psychosocial Development

- Emotional development is orderly; complex emotions seem to develop from earlier, simpler ones.
- Crying, smiling, and laughing are early signs of emotion. Other indices are facial expressions, motor activity, body language, and physiological changes.
- Brain development is closely linked with emotional development.
- Self-conscious and self-evaluative emotions arise after the development of self-awareness.

**personality** (161)

**emotions** (161)

**social smiling** (163)

**anticipatory smiling** (163)

**self-conscious emotions** (163)

**self-awareness** (163)

**self-evaluative emotions** (163)

**altruistic behavior** (164)

**empathy** (164)

**mirror neurons** (164)

- Many children seem to fall into one of three categories of temperament: “easy,” “difficult,” and “slow-to-warm-up.”
- Temperamental patterns appear to be largely inborn and to have a biological basis. They are generally stable but can be modified by experience.
- Goodness of fit between a child’s temperament and environmental demands aids adjustment.
- Cross-cultural differences in temperament may reflect child-raising practices.

**temperament** (165)

**“easy” children** (165)

**“difficult” children** (165)

**“slow-to-warm-up” children** (165)

**goodness of fit** (166)

- Child-raising practices and caregiving roles vary around the world.
- Infants have strong needs for maternal closeness, warmth, and responsiveness as well as physical care.
- Fatherhood is a social construction. Fathering roles differ in various cultures.
- Although significant gender differences typically do not appear until after infancy, US fathers, especially, promote early gender-typing.

**gender** (169)

**gender-typing** (170)

## Developmental Issues in Infancy

- According to Erikson, infants in the first 18 months are in the first stage of personality development: basic sense of trust versus mistrust. Sensitive, responsive, consistent caregiving is the key to successful resolution of this conflict.
- Research based on the Strange Situation has found four patterns of attachment: secure, avoidant, ambivalent (resistant), and disorganized-disoriented.
- Newer instruments measure attachment in natural settings and in cross-cultural research.
- Attachment patterns may depend on a baby’s temperament as well as on the quality of parenting and may have long-term implications for development.
- Stranger anxiety and separation anxiety may arise during the second half of the 1st year and appear to be related to temperament and circumstances.
- A parent’s memories of childhood attachment can influence their own child’s attachment.
- Mutual regulation enables babies to play an active part in regulating their emotional states.
- A mother’s depression, especially if severe or chronic, may have serious consequences for her infant’s development.
- Social referencing has been observed by 12 months.

**basic sense of trust versus mistrust** (171)

**attachment** (171)

**Strange Situation** (172)

**secure attachment** (172)

**avoidant attachment** (172)

**ambivalent (resistant) attachment** (172)

**disorganized-disoriented attachment** (173)

**stranger anxiety** (173)

**separation anxiety** (173)

**mutual regulation** (175)

**interactional synchrony** (175)

**still-face paradigm** (175)

**social referencing** (176)

## Developmental Issues in Toddlerhood

- The sense of self arises between 4 and 10 months, as infants begin to perceive a difference between self and others and to experience a sense of agency and self-coherence.
- The self-concept builds on this perceptual sense of self and develops between 15 and 24 months with the emergence of self-awareness and self-recognition.

- Erikson's second stage concerns autonomy versus shame and doubt. In US culture, negativism is a normal manifestation of the shift from external control to self-control.
- Socialization, which rests on internalization of societally approved standards, begins with the development of self-regulation.
- A precursor of conscience is committed compliance to a caregiver's demands; toddlers who show committed compliance tend to internalize adult rules more readily than those who show situational compliance. Children who show receptive cooperation can be active partners in their socialization.
- Parenting practices, a child's temperament, the quality of the parent-child relationship, and cultural and socioeconomic factors may affect the ease and success of socialization.

**self-concept (177)**

**autonomy versus shame and doubt (179)**

**socialization (179)**

**internalization (179)**

**self-regulation (179)**

**conscience (181)**

**situational compliance (181)**

**committed compliance (181)**

**receptive cooperation (181)**

## Relationships with Other Children

- Sibling relationships play a distinct role in socialization; what children learn from relations with siblings carries over to relationships outside the home.
- Between ages 1½ and 3 years, children tend to show more interest in other children and an increasing understanding of how to deal with them.

## Children of Working Parents

- In general, mothers' workforce participation during a child's first 3 years seems to have little impact on development.
- Child care by other than the parents varies in quality. The most important element in quality of care is the caregiver.
- Although quality, quantity, stability, and type of care influence psychosocial and cognitive development, the influence of family characteristics seems greater overall.

## Child Maltreatment

- Forms of maltreatment are physical abuse, neglect, sexual abuse, and emotional maltreatment.
- Most victims of maltreatment are infants and toddlers. Some die due to failure to thrive. Others are victims of shaken baby syndrome.
- Characteristics of the abuser or neglecter, the family, the community, and the larger culture all contribute to child abuse and neglect.
- Maltreatment can interfere with physical, cognitive, emotional, and social development, and its effects can continue into adulthood. Still, many maltreated children show remarkable resilience.

**physical abuse (185)**

**neglect (185)**

**sexual abuse (185)**

**emotional maltreatment (185)**

**sex trafficking (185)**

**nonorganic failure to thrive (186)**

**shaken baby syndrome (186)**

## outline

### PHYSICAL DEVELOPMENT

Aspects of Physical Development  
Health and Safety

### COGNITIVE DEVELOPMENT

Piagetian Approach  
Memory  
Intelligence  
Language Development  
Early Childhood Education

## learning objectives

Identify physical changes in early childhood.

Describe three views of the cognitive changes that occur in early childhood.

Summarize how language develops in early childhood.

Evaluate different approaches to early childhood education.

# Physical and Cognitive Development in Early Childhood



kali9/E+/Getty Images

## did you know?

- Children who are malnourished can be either stunted (small) or wasted (thin).
- The way parents talk with a child about a shared memory can affect how well the child will remember it.
- Although the initial striking gains diminish with time, the benefits of compensatory preschool programs such as Head Start far outweigh the costs.

*In this chapter, we look at physical and cognitive development from ages 3 to 6. Children grow more slowly than before but make enormous progress in muscle development and coordination. We trace their advances in the abilities to think, speak, and remember, and consider several health concerns, grounding the discussion with a consideration of socioeconomic and cultural influences. We end with a discussion of early childhood education.*



**T**ruly wonderful, the mind of a child is.  
—Yoda. *Star Wars Episode II, Attack of the Clones.*

# PHYSICAL DEVELOPMENT

## Aspects of Physical Development

In early childhood, children slim down and shoot up. They need less sleep than before and are more likely to develop sleep problems. They improve in running, hopping, skipping, jumping, and throwing balls. They also become better at tying shoelaces, drawing with crayons, and pouring cereal, and they begin to show a preference for using either the right or left hand.

### BODILY GROWTH AND CHANGE

Children grow rapidly between ages 3 and 6 but less quickly than before. At about 3, children normally begin to lose their babyish roundness and take on the slender, athletic appearance of childhood. As abdominal muscles develop, the toddler potbelly tightens. The trunk, arms, and legs grow longer. The head is still relatively large, but the other parts of the body continue to catch up as body proportions steadily become more adult-like. Both boys and girls typically grow about 2 to 3 inches a year during early childhood and gain approximately 4 to 6 pounds annually (Table 1). Boys' slight edge in height and weight continues until the growth spurt of puberty.

Muscular and skeletal growth progresses, making children stronger. Cartilage turns to bone at a faster rate than before, and bones become harder, giving the child a firmer shape and protecting the internal organs. These changes, coordinated by the still-maturing brain and nervous system, promote the development of a wide range of motor skills.

### SLEEP

Sleep patterns change throughout the growing-up years (Figure 1). Most US children average about 11 hours of sleep at night by age 5 and give up daytime naps (Hoban, 2004). In other cultures, the timing of sleep may vary. In the Gusii of Kenya, the Javanese in Indonesia, the Zuni in New Mexico, traditional Mayan communities, Italy, Spain, and



- Describe typical physical changes between ages 3 and 6, and compare boys' and girls' growth?

**TABLE 1** Physical Growth, Ages 3 to 6 (50th percentile\*)

Age	HEIGHT (INCHES)		WEIGHT (POUNDS)	
	Boys	Girls	Boys	Girls
3	39	38.4	36.5	34.0
4	41.7	41.3	41.0	40.0
5	44.4	44.1	46.6	46.2
6	46.8	46.8	52.6	52.3

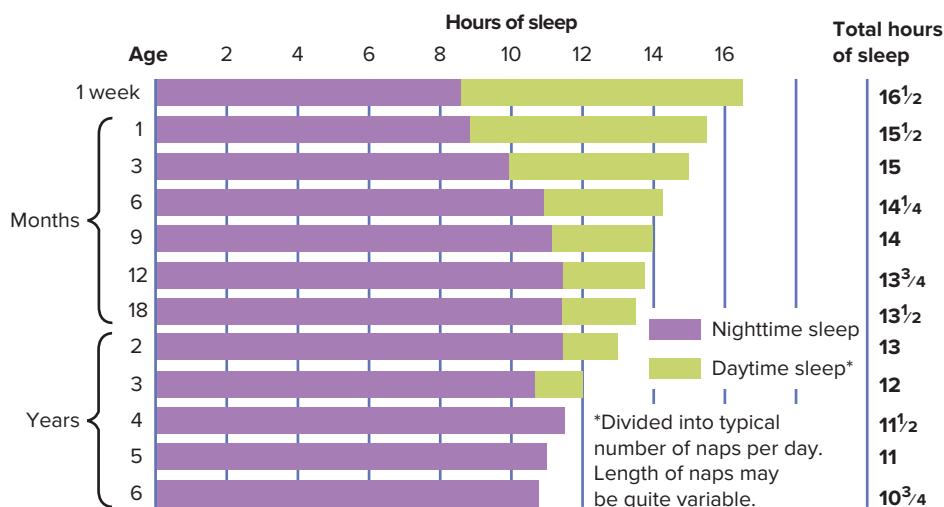
\*Fifty percent of children in each category are above this height or weight level, and 50 percent are below it.  
Source: Fryar et al. (2021).

**FIGURE 1**

## Typical Sleep Requirements in Childhood

*Preschoolers get all or almost all their sleep in one long nighttime period. The number of hours of sleep steadily decreases throughout childhood, but individual children may need more or fewer hours than shown here.*

Source: Ferber (1985); similar data in Ilgloowstein et al. (2003).



Greece, young children often have no regular bedtime and are allowed to stay up until they are sleepy (Broude, 1995; Jenni & O'Connor, 2005). Among the Canadian Hare, 3-year-olds don't take naps but are put to sleep right after dinner and sleep as long as they wish in the morning (Broude, 1995). Children in China, Hong Kong, India, Japan, Korea, Malaysia, Singapore, and Thailand go to bed later and sleep for less time at night than children from Australia, New Zealand, Canada, the United Kingdom, and the United States, but they make up the missing sleep with daytime naps (Mindell et al., 2013).

What are the cultural factors shaping the variations in sleep patterns? The processes are complex and not all variables important in one country are important in other countries. So, for example, research has shown an unhealthy diet, poor emotional or cognitive status, and a preference for evening wakefulness to be universal variables associated with poor sleep across multiple countries. However, variables such as screen time are important when they occur, but they do not occur in all countries. Moreover, some variables are differentially effective across different countries (Jeon et al., 2021). So, for instance, in one study, children in Asia were more likely to have sleep disturbances when they had siblings, but the same was not true for children in Europe, North America, and Australasia. Differences in the influence of siblings on sleep likely relate to differences in sleeping arrangements and nighttime routines. For example, young children in Asia more frequently shared rooms with their siblings (Sadeh et al., 2011).

**Sleep Disturbances** Almost half of children experience problems with getting or staying asleep (Carter et al., 2014), and about a third of parents or caregivers report sleep problems in their young child (Mindell et al., 2015). Sleep disturbances may be caused by accidental activation of the brain's motor control system (Hobson & Silvestri, 1999), by incomplete arousal from a deep sleep (Hoban, 2004), or by disordered breathing or restless leg movements (Carter et al., 2014). These disturbances are heritable and tend to run in families (Mainieri et al., 2021), and they are associated with anxiety (Brown et al., 2018), nasal abnormalities, and overweight (Waters et al., 2013). Problems are particularly prevalent in children with physical or learning disabilities, including both attention-deficit/hyperactivity disorder and autism (Neto et al., 2016; Cortese et al., 2020). Culture also matters. Parents from predominantly Asian countries report more sleep disturbances in their children than do White parents, and the sleep problems reported by Asian parents are more strongly associated with individual demographic variables than with actual sleep measures in children. This suggests parental perceptions and cultural expectations about sleep are driving the cultural differences (Sadeh et al., 2011).

In most cases, sleep problems are occasional and are usually outgrown (Mason & Pack, 2007). The majority of sleep problems are behavioral in nature and most commonly include refusing to go to bed, taking a long time to go to sleep, or frequent night waking

(Owens et al., 2019). Many sleep issues are the result of ineffective parenting practices that exacerbate rather than ease the problem (Sadeh et al., 2010). For instance, allowing young children to nap in the daytime to catch up on sleep can result in difficulty getting to sleep later that evening. Persistent sleep problems may indicate an emotional, physiological, or neurological condition that needs to be examined. For instance, colic, difficult temperament, premature birth, and altered circadian rhythm have been proposed as mechanisms responsible for the onset of disordered sleep (Bruni & Novelli, 2010). Possible sleep disturbances include night terrors, walking and talking while asleep, and nightmares.

A child who experiences a **night terror** appears to awaken abruptly from a deep sleep early in the night in a state of agitation. The child may scream and sit up in bed, breathing rapidly and staring or thrashing about. Yet they are not really awake. They quiet down quickly and remember nothing about the episode the next morning. Night terrors generally peak at about 1½ years of age (Petit et al., 2015), are common between 2½ and 4 years of age, and decline thereafter (Petit et al., 2007). Prevalence estimates of night terrors vary widely, but current data suggest that about 30 percent of children are affected, and boys and girls are equally prone to their occurrence (VanHorn & Street, 2019). Some researchers have proposed night terrors are related to anxiety (Crowe & Spiro-Levitt, 2021), and other studies have provided evidence for the strong role genetic influences play in their occurrence (Mainieri et al., 2021).

Walking and talking during sleep are fairly common in early and middle childhood. It is estimated that approximately 5 percent of children sleepwalk (Stallman & Kohler, 2016) and approximately 37 percent sleep talk (Laberge et al., 2000).

**Sleepwalking**, **sleepalking**, and night terrors share many characteristics. They all occur during slow wave sleep and are more common when children are sleep deprived, have a fever or are on medications, or when conditions are noisy. Moreover, during their occurrence, children are generally unresponsive to external stimulation and are confused. Some researchers have suggested that these events represent different manifestations of the same underlying disorder. There are several lines of evidence for this assertion. Sleepwalkers and people with sleep terrors tend to have family members who sleepwalk, have sleep terrors, or both. Moreover, parents who have a history of sleepwalking or sleepALKING tend to have children who have night terrors. Young children who have night terrors tend to later sleepwalk (Petit et al., 2015).

Sleepwalking and sleepALKING are generally harmless, and their frequency declines as children age. It is best not to interrupt sleepwalking or night terrors because interruptions may confuse and further frighten the child. Rather, the child can be quietly guided back to the bedroom and tucked in to sleep.

**Nightmares** are common during early childhood, peaking between 6 to 10 years of age (Carter et al., 2014). The occurrence of nightmares has been related to difficult child temperament, high overall childhood anxiety, and bedtime parenting practices that promote dependency (Moore, 2012). Sometimes watching an action-packed television program, seeing a terrifying movie, or hearing a frightening bedtime story have been implicated, although results on this are inconsistent (Schredl et al., 2008).

An occasional bad dream is no cause for alarm, but frequent or persistent nightmares, especially those that make a child fearful or anxious during waking hours, may signal excessive stress (Kovachy et al., 2013) and are correlated with emotional, attentional, and conduct problems (Li et al., 2011).

**Bed-Wetting** Most children stay dry, day and night, by age 3 to 5, but **enuresis**, repeated, involuntary urination at night by children old enough to be expected to have bladder control, is not unusual.

Preschool children normally recognize the feeling of a full bladder while asleep and awaken to empty it. Children who wet the bed do not yet have this awareness. About 15 percent of

#### night terror

Abrupt awakening from a deep sleep in a state of agitation, generally occurs in young children.

#### sleepwalking

Walking around and sometimes performing other functions while asleep.

#### sleepALKING

Talking while asleep.

#### nightmare

A bad dream, sometimes brought on by staying up too late, eating a heavy meal close to bedtime, or overexcitement.

#### enuresis

Repeated urination in clothing or in bed.



Racial and ethnic minority children report poorer sleep duration and quality than White children, although Black children generally nap more than do White children (Smith et al., 2019).



Nightmares are common in children and have been related to difficult temperament, anxiety, dependency, and stress.  
Yuliya Evstratenko/Shutterstock

5-year-olds, more commonly boys, wet the bed regularly, often while sleeping deeply (von Gontard et al., 2011). The discovery of genetic loci linked to enuresis (Jørgensen et al., 2021) points to heredity as a major factor.

Children and their parents need to be reassured that enuresis is common and not serious. The child is not to blame and should not be punished. More than half of children outgrow bed-wetting without special help (DiBianco et al., 2014). Parents need not seek professional help unless children themselves are distressed by bed-wetting. Enuresis that is particularly persistent is most commonly treated with an antidiuretic hormone or nighttime alarm (Walle et al., 2012).

## BRAIN DEVELOPMENT

During the first few years of life, brain development is rapid and profound. From ages 3 to 6, the most rapid brain growth occurs in the frontal areas that regulate planning and goal setting, and the density of synapses in the prefrontal cortex peaks at age 4 (Lenroot & Giedd, 2006). This “exuberant connectivity” will gradually be pruned over time as a result of experience, a process that underlies the great plasticity of the human brain. In addition, myelin (a fatty substance that coats the axons of nerve fibers and accelerates neural conduction) continues to form.

By age 6, the brain has attained about 90 percent of its peak volume (Stiles & Jernigan, 2010). From ages 6 to 11, rapid brain growth occurs in areas that support associative thinking, language, and spatial relations (Thompson et al., 2000). Much of this development occurs in the prefrontal cortex, a change that appears to support children’s increasing cognitive flexibility (Buttleman & Karbach, 2017).

The corpus callosum is a thick band of nerve fibers that connects both hemispheres of the brain and allows them to communicate more rapidly and effectively with each other. The corpus callosum continues to be myelinated throughout childhood and adolescence, with peak volume occurring later in boys than in girls (Luders et al., 2010).

### checkpoint can you...

- Identify five common sleep problems and give recommendations for handling them?
- Summarize changes in the brain during childhood and discuss their possible effects?

#### gross motor skills

Physical skills that involve the large muscles.

#### fine motor skills

Physical skills that involve the small muscles and eye–hand coordination.

#### systems of action

Increasingly complex combinations of motor skills, which permit a wider or more precise range of movement and more control of the environment.

## MOTOR SKILLS

Children ages 3 to 6 make great advances in motor skill developments—both **gross motor skills**, such as running and jumping, which involve the large muscles (Table 2), and **fine motor skills**, which are manipulative skills such as buttoning and drawing that involve eye-hand and small-muscle coordination. They also begin to show a preference for using either the right or left hand. As they develop motor skills, preschoolers continually merge abilities they already have with those they are acquiring to produce more complex capabilities. Such combinations of skills are known as **systems of action**.

**TABLE 2** Gross Motor Skills in Early Childhood

3-Year-Olds	4-Year-Olds	5-Year-Olds
Cannot turn or stop suddenly or quickly	Have more effective control of stopping, starting, and turning	Can start, turn, and stop effectively in games
Can jump a distance of 15 to 24 inches	Can jump a distance of 24 to 33 inches	Can make a running jump of 28 to 36 inches
Can ascend a stairway unaided, alternating feet	Can descend a long stairway alternating feet, if supported	Can descend a long stairway unaided, alternating feet
Can hop, using an irregular series of jumps	Can hop four to six steps on one foot	Can easily hop a distance of 16 feet

Source: Corbin (1973).



*Children make significant advances in motor skills during the preschool years. As they develop physically, they are better able to make their bodies do what they want. Large-muscle development lets them ride a tricycle or use a swing; increasing eye-hand coordination helps them use scissors effectively.*

(tricycle): Elena Zakh/Shutterstock; (tire swing): Ariel Skelley/Blend Images/Getty Images; (cutting): Fertnig/E+/Getty Images

At about 2½, children begin to jump with both feet, a skill they have not been able to master before this time. Hopping is hard to master until about 4. Going up stairs is easier than going down; by 3½, most children comfortably alternate feet going up, but they don't easily descend that way until about age 5. Skipping is challenging; although some 4-year-olds can skip, most children cannot do it until age 6 (Corbin, 1973). Of course, children vary in adeptness, depending on their genetics and their opportunities to learn and practice motor skills.

Motor coordination in childhood tends to be a relatively stable trait over time. The gross motor skills developed during early childhood are the basis for sports, dancing, and other activities that often begin in middle childhood. Thus, it is perhaps not surprising that motor coordination predicts participation in sports (Vandorpe et al., 2012). Motor coordination has also been associated with both childhood and adolescent levels of physical activity, although it does not necessarily predict adult physical activity (Lopes et al., 2011; Hofhelder & Schott, 2014). Moreover, poor motor coordination has been associated with an increased risk of obesity or overweight in children in what is likely to be a reciprocal relationship (Cattuzzo et al., 2016).

Children from non-Western countries are exposed to different motor activities, and thus we might expect their development to likewise differ. What little information exists illustrates the influence of culture on motor development. For example, 4- to 6-year-old American children performed better than children from Hong Kong at throwing and catching tasks, presumably due to encouragement in sports activities (Chow et al., 2001), and 4-year-old Brazilian children were more advanced motorically than British children, perhaps because of more frequent opportunities for free-play activities (Victora et al., 1990). Likewise, Belgian children scored higher on activities such as jumping and moving sideways and hopping than Australian children, and Australian children were more likely to score below norm averages, an effect again attributed to different physical experiences in childhood (Bardid et al., 2015).

Young children develop best physically when they can be active at an appropriate maturational level in unstructured free-play. Although more data are needed, interventions designed to increase motor coordination in young children have been shown to be an effective means of improving their motor abilities (Wick et al., 2017). However, children under 6 are rarely ready to take part in any organized sport.

Gains in fine motor skills, such as tying shoelaces and cutting with scissors, involve eye-hand and small-muscle coordination. At 3, most children can pour milk into a cereal

## handedness

Preference for using a particular hand.

### checkpoint can you ...

- Distinguish between gross motor skills and fine motor skills, and give examples of each type that improve during early childhood?
- Tell how brain functioning is related to motor skills and handedness?

bowl, eat with silverware, and use the toilet alone. At 4, children can dress themselves with help. They can cut along a line, draw designs and crude letters, and fold paper into a double triangle. At 5, children can dress themselves without much help, copy a square or triangle, and draw a more elaborate person than before.

**Handedness**, the preference for using one hand over the other, is usually evident by about age 3. Because the left hemisphere of the brain, which controls the right side of the body, is usually dominant, 90 percent of people favor their right side (Coren, 2012). Boys are more likely to be left-handed than are girls. For every 100 left-handed girls, there are 123 left-handed boys (Papadatou-Pastou et al., 2008).

As with gross motor skills, culture can influence development. For example, 4- to 6-year-old children from Hong Kong performed better on fine motor tasks than did American children, presumably because of their use of chopsticks and earlier practice with writing tools in preschool (Chow et al., 2001). Alternatively, a lack of practice can lead to slower motor development. Children of Arab descent, whose family members often dressed them and who thus had little practice, performed poorly on tasks such as putting on or taking off clothes on a standardized test of motor abilities when compared to Western samples (Al-Naquib et al., 1999).

## Health and Safety

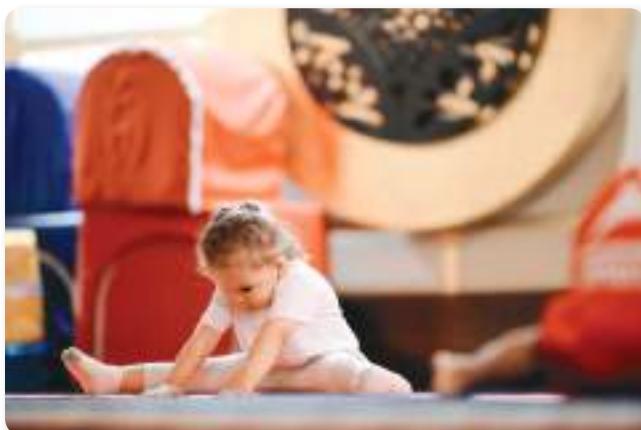
Because of widespread immunization, many of what once were the major diseases of childhood are much less common in Western industrialized countries. In the developing world, however, such vaccine-preventable diseases as measles, pertussis (whooping cough), and tetanus still take a large toll. Even in technologically advanced societies, this is a less healthy time for some children than for others.

### OBESITY AND OVERWEIGHT

Worldwide, an estimated 39 million children under age 5 were obese in 2020. Once primarily a problem of high-income countries such as the United States, obesity and overweight are also on the rise in low- and middle-income countries, particularly in urban settings (World Health Organization, 2021). The prevalence rate is rising more quickly for poorer than richer countries, and this socioeconomic disparity has been increasing in the last 2 decades (Chung et al., 2016).

Obesity is a serious problem among US preschoolers. In 2015–2016, almost 14 percent of 2- to 5-year-olds had a body mass index (BMI) at or above the 95th percentile for their age; this number was slightly higher in boys than girls. This number was highest in Hispanic children (25.8 percent), followed by African American (22 percent), and White children (14.1 percent), with the lowest obesity rates found in Asian American children (11 percent) (Hales et al., 2017). Children who come from families lower on the socioeconomic ladder are more likely to be obese (Ogden et al., 2010). Although researchers thought for a time that prevalence rates had leveled off in the United States, more recent data suggest they are still rising. Overweight was also an issue; approximately 26 percent of children aged 2 to 5 years have a BMI placing them in the overweight category, with findings for gender and ethnicity mirroring those for obesity (Skinner et al., 2018).

Among the potential long-term effects of the COVID-19 pandemic are increased prevalence rates for overweight and obesity in children. Previous research has shown that children, particularly those from low-income families, are likely to gain weight and show declines in fitness during the summer months, presumably as an effect of the unstructured days of vacation (Weaver et al., 2019). When the pandemic began to surge in the United



Once primarily a problem of high-income countries, obesity is also on the rise in middle- and low-income countries.

ozgurcankaya/Getty Images

## HEALTH RISKS OF SCREEN TIME DURING COVID-19

Five-year old Arya is engrossed with her favorite TV show, *Paw Patrol*, on her blue Amazon Fire tablet. She giggles as she watches Chase and Skye save the day. Arya used to be allowed to watch only one episode a day, but lately, her dads have been so busy that she gets to watch as many as she wants. Although this makes Arya happy, she misses running around with her friends during recess and walking with her friends to school.

Amid transitions to virtual schooling and with parents working from home, it was inevitable that screen time for children would increase. Across 6 countries, parents reported that their children were using screens nearly an hour more a day during the pandemic (Ribner et al., 2021). In the US, children spent 1.5 hours on screens doing school-related work, while also spending over 8 hours a day in unstructured, sedentary activities that involved screen time (e.g., TV) and other screen-free activities (e.g., dinner) (Dutton et al., 2020).

Even before the start of the pandemic and the increased screen time it brought, concerns about the effects of screen time on physical activity and health were raised by policy makers. The American Academy of Pediatrics (AAP) and the World Health Organization (WHO) strongly recommend a maximum of an hour of screen time for children ages 2 to 5 and at least 3 hours of physical activity (AAP, 2016; WHO, 2019). However, many children do not meet these daily guidelines (Chen & Adler, 2019; Domoff et al., 2019). Excessive screen time is associated with more

sedentary behavior and risk for cardiovascular disease (Lissak et al., 2018).

The COVID-19 pandemic has dramatically changed the landscape for families and children worldwide. The historic closures of offices, schools and daycares have been particularly detrimental for low-income families, where resources and support are already limited (Conti, 2020). Research shows that, even prior to COVID-19, children living in low-socioeconomic homes were already at greater risk for obesity. The reasons for this are myriad, but one contributing influence is that these children are provided more opportunities for screen time compared to their high-socioeconomic peers (Tandon et al., 2012). Moreover, during the pandemic, this risk was exacerbated. For instance, children from lower-SES homes were more likely to use screens for entertainment relative to education than were children from higher-income families (Ribner et al., 2021).

These preliminary data suggest that COVID-19 has implications for increased screen time and poorer physical health, and this association may be particularly important in low-income families.



How would you regulate a child's screen time when screens are required for schooling? Do you believe there are ways that screens can be used to promote physical activity?

States in 2020, it forced an almost total shutdown of primary schools (Education Week, 2020). This lockdown led to a rise in children's body weight, BMI, and obesity rates (Chang et al., 2021). Moreover, the changes in childhood obesity and overweight prevalence rose and rose more dramatically in urban and low-income families (Rundle et al., 2020; Research in Action).

A tendency toward obesity can be hereditary, but the main factors driving the obesity epidemic are environmental. Excessive weight gain hinges on increases in caloric intake, changes in diet composition, declining levels of physical activity, and changes in the gut microbiome (Sahoo et al., 2015; Ng et al., 2014). A key to preventing obesity may be to make sure older preschoolers are served appropriate portions of healthy, high-nutrient foods. Eating family meals together, getting adequate amount of sleep, and watching less than 2 hours of television a day are also associated with decreased risk (Anderson & Whitaker, 2010). Another important factor is the availability of highly processed, energy-dense, nutrient-poor foods (Crino et al., 2015).

Prevention of obesity in the early years is critical. Overweight children tend to become obese adults (Kumar & Kelly, 2017), and excess body mass in childhood is a risk factor for diseases such as diabetes, heart disease, and cancer in adulthood (Llewellyn

et al., 2016). Thus, early childhood, when a child's diet is still subject to parental influence or control, is a good time to treat obesity. Trends toward childhood obesity can be identified as early as 6 months of age, and the earlier interventions start for at-risk children, the more likely they are to be effective (De Onis et al., 2010).

## UNDERNUTRITION

In countries such as the United States, overweight and obesity are the common patterns. However, although many people associate malnutrition with starvation; "hidden hunger" can also arise through a consistent high-calorie, highly processed, nutrient-poor diet. Diets such as these are common in lower-income families doing their best to stretch their dollars.

Food insecurity occurs when families do not have dependable access to adequate amounts of food to support healthy living. An estimated 15 percent of children lived in food-insecure households in 2019 (Federal Interagency Forum on Child and Family Statistics, 2017). When budgets stretch thin, healthy whole foods may be nixed in favor of highly processed foods and baked goods. Empty-calorie foods such as these are cheaper; however, they are high in calories and low in nutrients.

In early childhood, food insecurity and low-quality diet have been linked to vitamin and mineral deficiencies, higher body weight, and reduced cognitive and social-emotional skills (Barroso et al., 2016; Johnson & Markowitz, 2017; Skalicky et al., 2006). This type of diet has also been implicated in promoting rapid weight gain during early childhood (Lobstein et al., 2015). Unfortunately, the COVID-19 pandemic is exacerbating existing inequities. For example, in December 2020, 15.8 percent of Black families with children and 17 percent of Hispanic families reported sometimes or often not having enough food to eat, in comparison with 9 percent of White families (US Census Bureau, 2021).

In many developing countries, malnutrition rather than obesity is the primary concern. Malnutrition can take various forms. Some children appear to be of normal weight but are shorter than they should be for their age and may have cognitive and physical deficiencies. We call these children stunted. This form of malnutrition is often the result of chronic, persistent hunger. Other children are an appropriate height for their age but are thinner than they should be. We call these children wasted. This form of malnutrition is generally the result of a recent, rapid weight loss. In 2020, approximately 149.2 million children under the age of 5 were stunted, and another 45.4 million were wasted from lack of adequate nutrients and calories (UNICEF, 2021).

Nutrition-related factors are the underlying cause in about 45 percent of worldwide deaths for children under 5 (World Health Organization, 2021). Africa (32 percent) and South Asia (31.8 percent) have the highest level of stunting, and South Asia has the highest levels of wasting (14.7 percent). In North America, by comparison, 3.2 percent of children are stunted and 0.2 percent are wasted. Hidden hunger is most prevalent in Africa, where approximately 76 percent of children under the age of 5 lack at least one essential micronutrient in their diet (UNICEF, 2021).

Because undernourished children usually live in extremely deprived circumstances, the specific effects of poor nutrition are hard to determine. However, taken together, these deprivations may negatively affect not only growth and physical well-being but cognitive and psychosocial development as well (Martorell et al., 2010), and the effects are long-lasting (Liu et al., 2003).

About 50 percent of children are picky eaters, although about 40 percent of them will outgrow their pickiness by young adulthood (Van Tine et al., 2017).



### checkpoint can you...

- Summarize obesity trends among preschoolers and explain why overweight is a concern in early childhood?
- Describe the two primary forms of malnutrition and their effects on developing children?

## FOOD ALLERGIES

A food allergy is an abnormal immune system response to a specific food. Reactions can range from tingling in the mouth and hives to more serious, life-threatening reactions such as shortness of breath and even death. Ninety percent of food allergies can be attributed to eight foods: milk, eggs, peanuts, tree nuts, fish, soy, wheat, and shellfish (Boyce et al., 2010). Food allergies are more prevalent in children than adults, and most children will outgrow their allergies (Branum & Lukacs, 2008). In the United States, approximately 8 percent of children suffer from some form of food allergy (Gupta et al., 2018).

Children who suffer from food allergies are, on average, smaller and shorter than children without food allergies (Sova et al., 2013). Additionally, while morbidity and mortality as a result of allergic reactions are generally low given most families' vigilance in monitoring food intake, there are negative psychosocial consequences to having food allergies. These include an increased risk of anxiety and depression, constraints on the types of activities that can be participated in by a family, and negative influences on school attendance and participation (Cummings et al., 2010).

Research on children under age 18 has demonstrated an increase in the prevalence of skin and food allergies over the past 30 years (Sicherer & Sampson, 2018). The increase in food allergies is occurring across both Western and non-Western countries, although the particular pattern of allergic responses shifts in accordance with differences in feeding patterns (Loh & Tang, 2018). There is no clear pattern to the increase in allergies, and it exists equally for boys and girls and across different races and ethnicities (Branum & Lukacs, 2008; Jackson et al., 2013). However, children across a variety of different cultures with a variety of allergies, including indoor and outdoor allergies, skin allergies, and food allergies, are more likely to come from families of higher socioeconomic status (Uphoff et al., 2015).

Changes in diet, how foods are processed, the timing of the introduction of foods, and decreased vitamin D based upon less exposure to the sun have all been suggested as contributors to the increase in allergy rates. A theory that society is too clean and that children's immune systems are less mature because they are not exposed to enough dirt and germs has also been explored. The link between eczema and food allergies has also led some researchers to theorize that sensitization to allergens develops through skin exposure. Additionally, better awareness by doctors and parents might factor into the reported increases (Sicherer & Sampson, 2018). Although possible explanations abound, not enough evidence exists to pinpoint a cause.

## ORAL HEALTH

By age 3, all the primary (baby) teeth are in place, and the permanent teeth, which will begin to appear at about age 6, are developing. Thus, parents usually can safely ignore the common habit of thumbsucking in children under age 4. If children stop sucking thumbs or fingers by that age, their permanent teeth are not likely to be affected (American Dental Association, 2007).

Tooth decay in early childhood often stems from overconsumption of sweetened milk and juices in infancy, especially when bottles are taken to bed, together with a lack of regular dental care. Worldwide, the decay in primary teeth has declined, most notably when fluoridated toothpaste is introduced to a country (Lagerweij & Van Loveren, 2015). However, disadvantaged children still have more untreated cavities than other children (Slade & Sanders, 2018).

Fluoride is a mineral essential for the maintenance and solidification of bones (Giri, 2016). At low levels, fluoride has been shown to reduce the incidence of **dental caries**—or cavities (dos Santos et al., 2013). Fluoride can be administered topically, via toothpaste, mouthwashes, or gels; or systemically, via supplements or the water supply (Buzalaf & Levy, 2011). Given the low risk and high effectiveness of low levels of fluoridated toothpaste, topical administration is now generally recommended (Tubert-Jeannin et al., 2011).



*Across a number of different countries, rates of allergies have increased over the past 30 years.*  
Tom Le Goff/Photodisc/Getty Images

## DEATHS AND ACCIDENTAL INJURIES

Worldwide, estimates are that approximately 5.2 million children under the age of 5 died in 2019 (UNICEF, 2021). The accompanying Window on the World discusses children's chances of surviving the first 5 years of life the world over.

In the United States, deaths in childhood are relatively few compared with deaths in adulthood (Murphy et al., 2021), although they are nonetheless consistently higher than death rates in countries with a similar profile (Thakrar et al., 2018). Accidents are the leading cause of death in the United States for children from 5 to 12 years of age. Fatal

**dental caries**  
Tooth decay, cavities.

# window on the world

## THE FIRST 5 YEARS

International efforts to improve child health focus on the first 5 years of life because more than 80 percent of deaths in children under age 15 occur during those years. Worldwide, infectious diseases such as pneumonia, diarrhea, and malaria, as well as preterm birth and intrapartum-related complications are the leading causes of death in young children (UNICEF, 2021). The chances of a child living to their 5th birthday have nearly tripled during the past 50 years (Hug et al., 2018).

Almost all of child deaths (98 percent) occur in the poorest regions of developing countries, where nutrition is inadequate, water is unsafe, and sanitary facilities are lacking (UNICEF, 2015). Poor air quality appears to be strongly associated with increased mortality risk. Maternal variables are also important with respect to under-5 mortality, particularly newborn deaths. Children born to mothers who are young, uneducated, or have had children closely spaced are at higher risk (Hug et al., 2018).

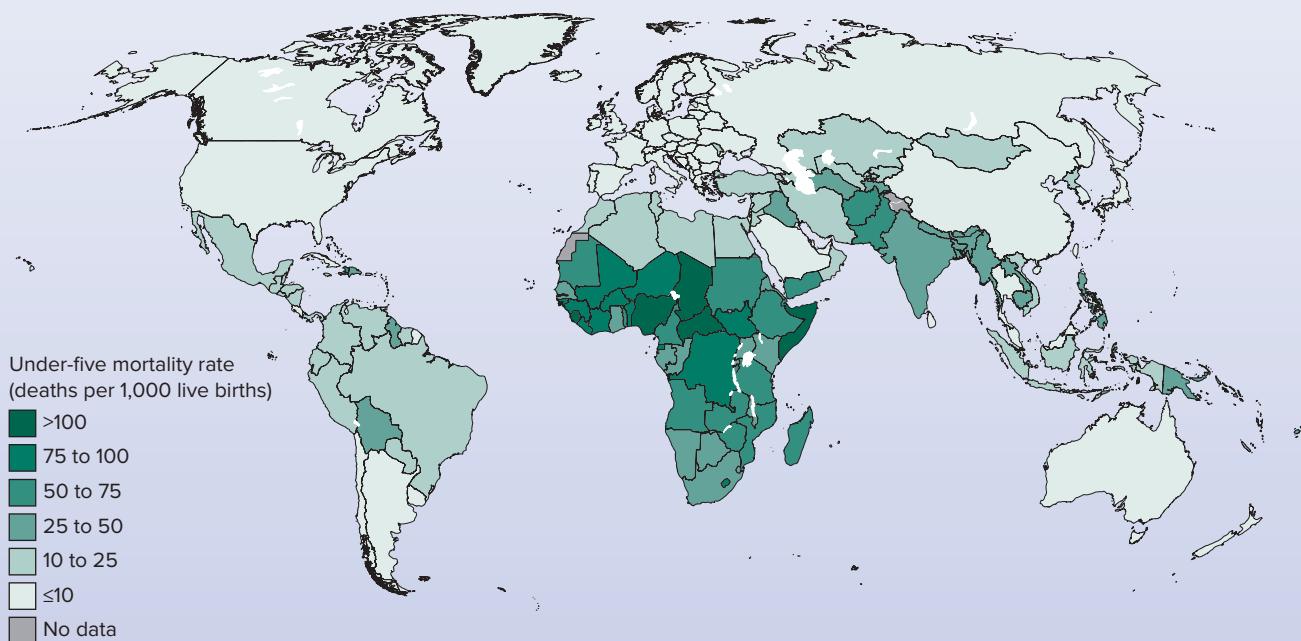
The highest under-5 mortality rates are found in sub-Saharan African, where on average 1 child in

every 13 dies before their 5th birthday. By contrast, in Australia and New Zealand, where the lowest rates of under-5 mortality are found, on average, 1 child in every 264 dies by the age of 5 (UNICEF et al., 2020).

A global effort is being made to reduce child mortality rates. The biggest focus is on improved family care and education, nutrition supplementation, and breast-feeding practices. These approaches are accompanied by interventions for maternal health, including skilled care during pregnancy and childbirth. Other successful programs focus on vaccinations, antibiotics, and insecticide-treated bed nets (UNICEF, 2015).



What might be done to produce more rapid and more evenly distributed improvements in child mortality throughout the world?



Note: The classification is based on unrounded numbers. This map does not reflect a position by UN IGME agencies on the legal status of any country or territory or the delimitation of any frontiers.

Source: UNICEF (2020).

home injuries are the most common cause of accidental deaths in the United States and across multiple European countries, at least in children under the age of 5. After 5 years of age, the risk of home injuries decreases as the risk of fatal car accidents increases. Other common causes for death in children are drowning, fires, falls, poisoning, and homicide (Murphy et al., 2021; Sengoelge et al., 2011).

US laws requiring childproof caps on medicine bottles and other dangerous household products, regulation of product safety, mandatory helmets for bicycle riders, and safe storage of firearms and medicines have improved child safety. Additionally, all 50 states and the District of Columbia require young children to ride in specially designed car seats or wear seat belts.

Other common causes of death in early childhood include cancer, congenital abnormalities and chromosomal disorders, assault and homicide, heart disease, respiratory diseases (including both chronic respiratory disease as well as influenza and pneumonia), and septicemia (a bacterial infection that poisons the blood, leading to organ failure) (Murphy et al., 2021).

## ENVIRONMENTAL INFLUENCES

Why do some children have more illnesses or injuries than others? Some children seem genetically predisposed toward certain medical conditions. In addition, environmental factors play major roles.

**Socioeconomic Status** The lower a family's socioeconomic status, the greater a child's risks of illness, injury, and death (Braveman et al., 2010). Poor children are more likely than other children to have chronic conditions and activity limitations, to lack health insurance, and to have unmet medical and dental needs. Social factors linked to poverty, such as increased stress, also impact health outcomes (Murray et al., 2013). American children living in poverty—15.5 percent of children under the age of 6 and disproportionately minority children—are more likely than other children to have chronic conditions and activity limitations, to lack health insurance, and to have unmet medical and dental needs (Federal Interagency Forum on Child and Family Statistics, 2021).

A key factor in health is, not surprisingly, access to necessary medical services. Health insurance is thus an important predictor of child health. The rate of uninsured children under the age of 18 in 2019 was 5.7 percent (Keisler-Starkey & Bunch, 2020). Because employee-sponsored insurance is the primary source of health coverage for many adults, many families lost their coverage during the job losses associated with the COVID-19 pandemic (Bundorf et al., 2021). Although states varied in their response, many families were able to access Medicaid. Approximately 10 million people enrolled in Medicaid between February 2020 and January 2021, bringing the total enrollment to a record high of 80.5 million. Approximately half of those enrolled in Medicaid are children (Fry-Bowers, 2021). Nonetheless, many children remain uninsured. Moreover, the shift toward telemedicine—in which appointments and consultations with health care providers are conducted remotely—is likely to further exacerbate existing inequities between children from different socioeconomic levels (McMorrow et al., 2020).

**Race/Ethnicity** The sharpest rise in the uninsured rate has been in Hispanic children (Alker & Roygardner, 2019), and Hispanic families continue to lag behind other groups in coverage, even when they are eligible. Although language and cultural barriers and the need for more Latino care providers may help explain some of these disparities (Artiga et al., 2020), researchers believe a “chilling effect” has occurred for families in which the child is a citizen but the parent is not. In 2019, the administration of President Donald Trump enacted a revision in immigration law making it more difficult for noncitizens to become permanent residents in the event they used public assistance. The share of legally eligible children receiving supplemental nutrition, food stamps, or health care subsequently showed a steep decline (Bernstein et al., 2021). In 2021, the administration of President Joe Biden reversed the decision. However, even with the reversal, it is likely the chilling effect of the law will persist for some time.



The typical symbol used for poison now is “Mr. Yuk”—a grimacing, green cartoon face sticking his tongue out. This graphic was put into use when researchers and public health agencies realized the traditional skull and crossbones, rather than indicating danger to young children, intrigued and interested them in the contents of containers.



*Families with children are the fastest-growing part of the homeless population. Homeless children tend to have more health problems than children with homes.*

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18 years old were homeless (Gultekin et al., 2020). An even larger number—approximately 38 percent of US households—lived in physically inadequate housing or crowded housing, or used more than 30 percent of their household income on housing costs (Federal Interagency Forum on Child and Family Statistics, 2021).

Many homeless children spend their crucial early years in unstable, insecure, and often unsanitary environments. They and their parents may be cut off from a supportive community, family and institutional resources, and ready access to medical care and schooling. These children suffer more physical health problems than poor children who have homes, and they are more likely to have a low birth weight or be born premature. Homeless children also tend to suffer from depression and anxiety and to have academic and behavior problems (Gultekin et al., 2020; Bassuk et al., 2015).

For those families that can secure the funds, federal rental assistance can be a lifeline and can reduce school moves, foster care placements, and housing instability. However, programs are underfunded, and only 1 in 4 eligible households receives assistance (Children's Defense Fund, 2020). As with other risk factors, the COVID-19 pandemic is almost certain to exacerbate the problem. The jobless rate more than doubled from prepandemic levels, and job losses were most striking in low-income occupations (Mitchell, 2021). While the Coronavirus Aid, Relief and Economic Security (CARES) Act of 2020 was of assistance to many families, the continuing economic fallout from COVID-19 threatens millions of Americans with unemployment and eviction.

**Environmental Pollutants** Smoking is bad for everyone; however, children, with their still-developing lungs and faster rate of respiration, are particularly sensitive to the damaging effects of exposure (Constant et al., 2011). Children exposed to parental smoke are at increased risk of respiratory infections such as bronchitis and pneumonia, ear problems, worsened asthma, and slowed lung growth. In 2017 to 2018, this number was 36 percent, with African American children and American children living in poverty at the highest risk (Federal Interagency Forum on Child and Family Statistics, 2021).

Air pollution is associated with increased risks of death and of chronic respiratory disease. Environmental contaminants also may play a role in certain childhood cancers, neurological disorders, attention-deficit/hyperactivity disorder, and intellectual disability (Woodruff et al., 2004). In 2019, 51 percent of US children lived in counties that failed to meet one or more national air quality standards (Federal Interagency Forum on Child and Family Statistics, 2021).

Children are also more vulnerable than adults to chronic pesticide damage. Pesticide exposure is greater in children in agricultural and inner-city families (Dilworth-Bart & Moore, 2006). More than half of all reported pesticide poisonings—almost 50,000 per year—occur in children younger than age 6 (Weiss et al., 2004). There is some evidence that low-dose pesticide exposure may affect the developing brain (Jurewicz & Hanke, 2008), and

BIPOC children are also more likely to be overweight or obese (Isong et al., 2018), have asthma (Urquhart & Clarke, 2020) or diabetes (Mayer-Davis et al., 2017), or have chronic conditions and activity limitations than White children (Federal Interagency Forum on Child and Family Statistics, 2021). Moreover, children from racial and ethnic minorities may experience stress-related health issues at higher rates due to cumulative effects of discrimination, stigma, and prejudice (Cheng & Goodman, 2015).

**Homelessness** Homelessness results from circumstances that force people to choose between food, shelter, and other basic needs. Since the 1980s, as affordable rental housing has become scarce and poverty has spread, homelessness has increased dramatically in the United States. Factors that contribute to homelessness include lack of employment opportunities, declines in public assistance funds, lack of affordable health care, domestic violence, mental illness, and addiction (National Coalition for the Homeless, 2020). In 2019, approximately 1.3 million children aged 5 to

children with long-term exposure score lower on cognitive indices and are more likely to have attentional issues and present with leukemia and brain tumors (Roberts & Karr, 2012).

Lead can also be a problem. Children can get elevated concentrations of lead from lead-contaminated food or water, from airborne industrial wastes, from putting contaminated fingers in their mouths, or from inhaling dust or playing with paint chips in homes or schools where there is lead-based paint. Lead poisoning can seriously interfere with cognitive development and can lead to neurological and behavioral problems (Federal Interagency Forum on Child and Family Statistics, 2021). Very high levels of lead concentration in the blood may cause headaches, abdominal pain, loss of appetite, agitation, or lethargy, and eventually vomiting, stupor, and convulsions (AAP Committee on Environmental Health, 2005).

Children's median blood lead levels dropped by 89 percent in the United States from 1976 to 1980 due to laws mandating removal of lead from gasoline and paints and reducing smokestack emissions (Federal Interagency Forum on Child and Family Statistics, 2005). The number of children aged 1 to 5 with elevated levels of lead in their blood has declined, from about 25 percent in 1994 to .9 percent in 2016; still, many children are at risk. Rates of elevated lead levels are highest among non-Hispanic Blacks and children living in poverty (Federal Interagency Forum on Child and Family Statistics, 2021).

## checkpoint can you . . .

- Compare the health status of young children in developed and developing countries?
- Tell where and how young children are most likely to be injured?
- Discuss environmental influences that endanger children's health and development?

# COGNITIVE DEVELOPMENT

## Piagetian Approach

Now, we turn our attention to Piaget's second stage, the **preoperational stage**. Lasting from approximately ages 2 to 7, it is characterized by an expansion in the use of symbolic thought. However, children are not yet fully ready to engage in logical mental operations. Let's look at some advances and some immature aspects of preoperational thought (Table 3 and Table 4) and at recent research, some of which challenges Piaget's conclusions.

### preoperational stage

In Piaget's theory, the second major stage of cognitive development, in which symbolic thought expands but children cannot yet use logic effectively.

**TABLE 3** Cognitive Advances during Early Childhood

Advance	Significance	Example
<b>Use of symbols</b>	Children do not need to be in sensorimotor contact with an object, person, or event in order to think about it.  Children can imagine that objects or people have properties other than those they actually have.	Simon asks his mother about the elephants they saw on their trip to the circus several months earlier.  Rolf pretends that a slice of apple is a vacuum cleaner "vrooming" across the kitchen table.
<b>Understanding of identities</b>	Children are aware that superficial alterations do not change the nature of things.	Antonio knows that his teacher is dressed up as a pirate but is still his teacher underneath the costume.
<b>Understanding of cause and effect</b>	Children realize that events have causes.	Seeing a ball roll from behind a wall, Aneko looks behind the wall for the person who kicked the ball.
<b>Ability to classify</b>	Children organize objects, people, and events into meaningful categories.	Rosa sorts the pinecones she collected on a nature walk into two piles: "big" and "little."
<b>Understanding of number</b>	Children can count and deal with quantities.	Lindsay shares some candy with her friends, counting to make sure that each gets the same amount.
<b>Empathy</b>	Children become more able to imagine how others might feel.	Emilio tries to comfort his friend when he sees that his friend is upset.
<b>Theory of mind</b>	Children become more aware of mental activity and the functioning of the mind.	Blanca wants to save some cookies for herself, so she hides them in a pasta box because she knows her brother will not look in a place where he doesn't expect to find cookies.

**TABLE 4** Immature Aspects of Preoperational Thought (According to Piaget)

Limitation	Description	Example
<b>Centration: inability to decenter</b>	Children focus on one aspect of a situation and neglect others.	Jacob teases his younger sister that he has more juice because his juice is in a tall, skinny glass while hers is in a short, wide glass.
<b>Irreversibility</b>	Children fail to understand that some operations or actions can be reversed, restoring the original situation.	Jacob does not realize that the juice in each glass can be poured back into the juice box from which it came, which means the amounts must be the same.
<b>Focus on states rather than transformations</b>	Children fail to understand the significance of the transformation between states.	In the conservation task, Jacob does not understand that transforming the shape of a liquid (pouring it from one container into another) does not change the amount.
<b>Transductive reasoning</b>	Children do not use deductive or inductive reasoning; instead, they see cause where none exists.	Luis was mean to his sister. Then she got sick. Luis concludes that he made his sister sick.
<b>Egocentrism</b>	Children assume everyone else thinks, perceives, and feels as they do.	Kara holds a book so only she can see the picture she is asking her father to explain to her.
<b>Animism</b>	Children attribute life to objects not alive.	Amanda says the car is hungry and wants some gas to eat.
<b>Inability to distinguish appearance from reality</b>	Children confuse what is real with outward appearance.	Courtney believes that if she wears blue-tinted glasses, then everything she sees really did turn blue.

When pretending, 3- and 4-year-old children tend to use body part gestures (such as pretending an outstretched finger is a toothbrush), whereas 5-year-olds are more likely to use imaginary object gestures (such as pretending to hold an invisible toothbrush) (Boyatzis & Watson, 1993).



#### symbolic function

Piaget's term for ability to use mental representations (words, numbers, or images) to which a child has attached meaning.

#### pretend play

Play involving imaginary people and situations; also called *fantasy play*, *dramatic play*, or *imaginative play*.

## ADVANCES OF PREOPERATIONAL THOUGHT

Advances in symbolic thought are accompanied by a growing understanding of space, causality, identities, categorization, and number.

**The Symbolic Function** “I want ice cream!” announces Amalia, age 4, trudging indoors from the hot, dusty backyard. She has not seen or smelled or tasted anything that triggered this desire—no open freezer door, no television commercial, no bowl of sweet ice cream temptingly sitting on the counter waiting to be eaten. Rather, she has called up the concept from her memories.

Being able to think about something in the absence of sensory or motor cues characterizes the **symbolic function**. Children who have attained symbolic function can use symbols, or mental representations, such as words, numbers, or images to which a person has attached meaning. This is a vital achievement because without symbols, people could not communicate verbally, make change, read maps, or treasure photos of distant loved ones.

Preschool children show the symbolic function through deferred imitation, pretend play, and language. Deferred imitation, which becomes more common after 18 months, is based on having kept a mental representation of an observed action—as when 3-year-old Deshawn scolds his little sister, using the same words he heard his father say to the delivery person who was late bringing the pizza. Another marker of symbolic function is **pretend play**. In pretend play, also called fantasy play, dramatic play, or imaginary play, children use an object to represent something else. For example, a child may hold up a remote control to their ear while pretending to talk on a telephone. The remote control is a symbol for the telephone they have seen their mother use. By far the most extensive use of the symbolic function is language. Language, at its heart, is a system of symbols. For example, the word *key* is a symbol for the class of objects used to open locks. When we see the emergence of language in young children, we have a wide and clear window into their increasing use of the symbolic function.

**Object Space** In addition to their growing ability to use the symbolic function, children also begin to be able to understand the symbols that describe physical spaces, although this process is slow. It is not until at least age 3 that most children reliably grasp the relationships between pictures, maps, or scale models and the objects or spaces they represent. Older preschoolers can use simple maps, and they can transfer the spatial understanding gained from working with models to maps and vice versa. So, for example, as they approach 5 years of age, most preschoolers can view a scale model of a room, be shown on that model where a toy is hidden, and then find the toy in the actual room (DeLoache, 2011).

**Causality** Piaget maintained that preoperational children cannot yet reason logically about cause and effect. Instead, he said, they reason by **transduction**. They mentally link two events, especially events close in time, whether or not there is logically a causal relationship. For example, Luis may think that his “bad” thoughts or behavior caused his own or his sister’s illness or his parents’ divorce.

Piaget was incorrect in believing that young children could not understand causality. When tested in situations that are appropriate to their overall level of cognitive development, young children do grasp cause and effect. For example, naturalistic observations of 2½- to 5-year-olds’ everyday language showed flexible causal reasoning. Children listed both physical (“The scissors have to be clean so I can cut better”) and social-conventional (“I have to stop now because you said to”) causes for their actions (Hickling & Wellman, 2001).

Other research has supported their ability to engage in more complex causal reasoning. In one study, children were shown two small lights and one large one. Pressing on one of the small lights, which was attached to the large light by a wire, caused the large light to illuminate. Four-year-old children were able to understand that a relevant change (switching the wire connection to the other small light) would alter the causal sequence but that an irrelevant change (moving a block near the light) would not (Buchanan & Sobel, 2011).

**Identities and Categorization** The world becomes more orderly and predictable as preschool children develop a better understanding of identities: the concept that people and many things are basically the same even if they change in outward form, size, or appearance. For example, putting on a wig does not make a person a different person; rather, it is just a surface change in appearance. This understanding underlies the emerging self-concept, and many of the processes involved in understanding the identity of others are mirrored in the understanding of one’s own identity.

Categorization, or classification, requires a child to identify similarities and differences. By age 4, many children can classify by two criteria, such as color and shape. Children use this ability to order many aspects of their lives, categorizing people as “good” or “bad,” “nice,” or “mean,” and so forth.

One type of categorization is the ability to distinguish living from nonliving things. When Piaget asked young children whether the wind and the clouds were alive, their answers led him to think they were confused. The tendency to attribute life to objects that are not alive is called **animism**. However, when later researchers questioned 3- to 5-year-olds more closely about the differences between a rat, a starfish, a toy car, and a robotic dog, the children showed they understood that rats and starfish are alive and toy cars and robotic dogs are not (Jipson & Gelman, 2007). In general, it appears that children attribute life to items that share characteristics with living things: things that move, make sounds, or have lifelike features such as eyes (Opfer & Gelman, 2011). For example, after watching a robot stack a pile of blocks, children were likely to attribute cognitive, behavioral, and especially affective characteristics to a robot (Beran et al., 2011).

**Number** Multiple lines of research have shown that infants have a rudimentary sense of number. Research suggests that infants as young as 4½ months indicate, with longer looking times and increased staring, that if one doll is added to another doll, there



*As this girl pretends to listen to the bear's heart, she is showing deferred imitation, the ability to act out a behavior she observed some time before.*

Duplass/Shutterstock

#### **transduction**

Piaget’s term for a preoperational child’s tendency to mentally link particular phenomena, whether or not there is logically a causal relationship.

#### **animism**

Tendency to attribute life to objects that are not alive.

should be two dolls, not just one. By 6 months of age, they can “count” higher and know that 8 dots are different from 16 dots (Libertus & Brannon, 2010). Other research has found that ordinality—the concept of comparing quantities (more or less, bigger or smaller)—seems to begin around 9 to 11 months (Suanda et al., 2008).

The cardinality principle, where children understand that the number of items in a set is the same regardless of how they are arranged and that the last number counted is the total number of items in the set regardless of how they are counted, starts to develop at about 2½ years of age. However, this ability is grounded in practical situations, such as checking to see which one of two plates has more cookies in it (Gelman, 2006). When asked to count six items, children younger than 3½ tend to recite the number names (one through six) but not to say how many total items there are (six). Most children do not consistently apply the cardinality principle in counting until age 3½ or older (Sarnecka & Carey, 2007). The use of gestures—most notably pointing—helps children count more effectively, and children intuitively develop such strategies to scaffold their early skills (Gordon et al., 2019). The understanding of the concept of zero is emerging at this time as well. Children who can understand the cardinality principle know that zero is less than 1, can often resist passing an object after being asked to hand over “zero balls,” but are unsure if zero is a number or not (Krajcsi et al., 2021).

By age 4, most children can say one tree is bigger than another or one cup holds more juice than another. If they have one cookie and then get another, they know they have more cookies than they had before. By age 5, most children can count to 20 or more and know the relative sizes of the numbers 1 through 10 (Siegler, 1998). By the time they enter elementary school, most children have developed basic “number sense” (Jordan et al., 2006). This basic level of number skills includes counting, number knowledge (ordinality), number transformations (simple addition and subtraction), estimation (“Is this group of dots more or less than 5?”), and recognition of number patterns (2 plus 2 equals 4, and so does 3 plus 1).

Socioeconomic status and preschool experience affect how rapidly children advance in math. By age 4, children from middle-income families have markedly better number skills than children from lower-income families, and their initial advantage tends to continue. Children whose preschool teachers do a lot of “math talk,” such as asking children to help count days on a calendar, tend to make greater gains than children whose teachers do not use this technique (Klibanoff et al., 2006); children whose mothers spontaneously use such speech in their interactions (Casey et al., 2018) also show greater gains. Also, playing number board or computer games with children enhances their numerical knowledge and can help low-income or low-achievement children catch up to their peers (Siegler, 2009; Aragón-Mendizábal et al., 2017).

Numerical competence is important: How well children understand numbers in kindergarten predicts their academic performance in math through third grade (Jordan et al., 2010), and deficient number sense has been associated with mathematical learning disabilities (Mazzocco et al., 2011).

## checkpoint can you...?

- Summarize findings about preschool children’s understanding of symbols, space, causality, identities, categorization, and number?

### centration

In Piaget’s theory, the tendency of preoperational children to focus on one aspect of a situation and neglect others.

### decenter

In Piaget’s terminology, to think simultaneously about several aspects of a situation.

### egocentrism

Piaget’s term for inability to consider another person’s point of view; a characteristic of young children’s thought.

## IMMATURE ASPECTS OF PREOPERATIONAL THOUGHT

One of the main characteristics of preoperational thought is **centration**: the tendency to focus on one aspect of a situation and neglect others. According to Piaget, preschoolers come to illogical conclusions because they cannot **decenter**—think about several aspects of a situation at one time. Centration can limit young children’s thinking about both social and physical relationships.

**Egocentrism** Egocentrism is a form of centration. According to Piaget, young children center so much on their own point of view that they cannot take in another’s. Egocentrism may help explain why young children sometimes have trouble separating reality from what goes on inside their own heads and why they may show confusion about what causes what. When Luis believes that his “bad thoughts” have made his sister sick or that he caused his parents’ marital troubles, he is thinking egocentrically.

To study **egocentrism**, Piaget designed the three-mountain task (Figure 2). A child sits facing a table that holds three large mounds. A doll is placed on a chair at the opposite side of the table. The investigator asks the child how the “mountains” would look to the doll. Piaget found that young children usually described the mountains from their own perspective. Piaget saw this as evidence that preoperational children cannot imagine a different point of view (Piaget & Inhelder, 1967).

However, posing the problem in a different way can yield different results. For example, 3-month-old infants will show surprise when an adult reaches for an object different from the one the adult previously showed a preference for (Choi et al., 2020). At 6 months, infants expect an adult to reach into a box where that adult falsely believes a toy has been placed rather than where the toy actually is (Southgate & Vernetti, 2014). And preschool children, when asked to hand one of two rubber ducks to an experimenter, are more likely to hand over the duck the experimenter can see even when the child can see both (Nilsen & Graham, 2009).

Why were these children able to take another person’s point of view when those doing the mountain task were not? Infants cannot speak, so we must ask them questions in the way they can answer—with visual gaze and reaching. And many preschoolers have difficulty expressing knowledge verbally but can show their understanding in other ways, such as by looking at a particular item in surprise or handing over the correct toy.

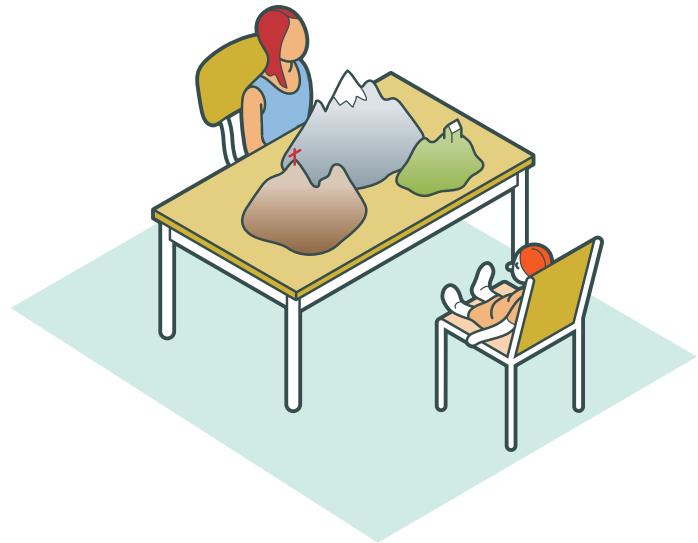
**Conservation** Another classic example of centration is the failure to understand **conservation**, the fact that two things that are equal remain so if their appearance is altered, as long as nothing is added or taken away. Piaget found that children do not fully grasp this principle until the stage of concrete operations and that they develop different kinds of conservation (e.g., liquids, solids) at different ages.

In Piaget’s classic conservation of liquid task, a child is shown two identical clear glasses, each short and wide and each holding the same amount of water. The child is then asked, “Is the amount of water in the two glasses the same?” When the child agrees, the researcher pours the water in one glass into a tall, thin third glass. Then the child is asked, “Do both glasses contain the same amount of water? Or does one contain more? Why?” In early childhood, children will say either the taller glass or the wider one contains more water. When asked why, they tend to say the glass is taller or wider, taking into account only one of the relevant dimensions.

Why do children make this error? Their responses are influenced by two immature aspects of thought: centration and **irreversibility**. Centration involves focusing on one dimension while ignoring the other. Preoperational children cannot consider height and width at the same time as they cannot decenter, or consider multiple attributes of an object or situation. In addition, children are limited by irreversibility: failure to mentally reverse an action. Because their thinking is concrete, preoperational children cannot realize that the original state of the water can be restored by pouring it back into the other glass, and thus it must be the same. Preoperational children focus on successive states, said Piaget, and do not recognize the transformation from one state to another.

## THEORY OF MIND

Clara, age 4, hates Brussels sprouts, but when her mother asks for them to be passed at the dinner table, she places the bowl in her mother’s hands. She now understands



**FIGURE 2**

### Piaget's Three-Mountain Task

A preoperational child is unable to describe the mountains from the doll's point of view—an indication of egocentrism, according to Piaget.

#### conservation

Piaget’s term for awareness that two objects that are equal according to a certain measure remain equal in the face of perceptual alteration so long as nothing has been added to or taken away from either object.

#### irreversibility

Piaget’s term for a preoperational child’s failure to understand that an operation can go in two or more directions.

### checkpoint can you . . .

- Tell how centration limits preoperational thought?
- Discuss research that challenges Piaget’s views on egocentrism in early childhood?

### theory of mind

Awareness and understanding of mental processes.

her mother might like Brussels sprouts, even though she herself finds them highly suspect. In understanding this, Clara is illustrating her growing understanding of others' minds.

**Theory of mind** is the understanding that others have their own thoughts, beliefs, desires, and intentions. Having a theory of mind allows us to understand and predict others' behavior and makes the social world understandable. Theory of mind includes knowledge of thinking about mental states, false beliefs, and distinguishing between fantasy and reality.

Piaget (1929) was interested in this growing ability, and to investigate it, he asked children such questions as "Where do dreams come from?" and "What do you think with?" On the basis of the answers, he concluded that children younger than 6 cannot distinguish between thoughts or dreams and real physical entities. However, Piaget's questions were abstract and he expected children to be able to put their understanding into words. More recent research using more concrete and everyday tasks indicates that between ages 2 and 5, children's knowledge about mental processes and their ability to distinguish between mental states and reality grows dramatically.

Once you have theory of mind, you can consider that others might have opinions different than yours. And, starting at about 5 years of age, children believe other kids don't like them as much as they actually do, and this "liking gap" gets bigger with age (Wolf et al., 2021).



**Knowledge about Thinking and Mental States** The knowledge of others' minds emerges early in life and becomes more complex with age. At 18 months of age, children can watch an adult fail at a task (such as pulling a toy apart into 2 pieces) and infer what the adult intended to do (Meltzoff, 1995). This illustrates their emerging understanding of goal-directed behaviors. At 2 years of age, children readily engage in pretend play, and at 3, they can use deception in simple games and predict others' actions on the basis of their desires (Frye & Moore, 2014).

Between ages 3 and 5, children come to understand that thinking goes on inside the mind; that it can deal with either real or imaginary things; and that it is different from seeing, talking, touching, and knowing (Flavell, 2000). They understand that thinking about the past or the future might make someone feel sad or happy (Lagattuta, 2014) and that another child would be sad if their toy were taken from them (Pesowski & Friedman, 2015). They start to expect people to act in accordance with their beliefs, and when asked to explain people's behavior, they use words such as *want* or *think*. They also know that people's expressions might not necessarily match their internal state (Wellman, 2014) and realize that you can manipulate others' mental states to deceive or tease them (Miller, 2009). And at 4 to 5 years of age, they understand that a person can believe something that they themselves know is not true (Frye & Moore, 2014).

By 5 years of age, they understand that if they are sad about something, they can try to think about something else or decide they don't want something anymore to feel better (Davis et al., 2010). However, it is not until a few years later that they understand that they can be wrong about what someone else thinks (Miller, 2009) and are introspective enough about mental processes to understand that the mind is continuously active (Flavell, 2016). Moreover, children do not fully realize they cannot control their dreams until about age 11 (Woolley & Boerger, 2002).

The recognition that others have mental states accompanies the decline of egocentrism and the development of empathy (Povinelli & Giambrone, 2001). In the following sections, we will look more closely at some of the abilities related to the understanding of mental states.

**False Beliefs and Deception** The understanding that people can hold false beliefs flows from the realization that people can hold incorrect mental representations of reality. For example, if you see your mother searching for an umbrella, but you know it's not raining outside, you can understand that she thinks it's raining, even if it is not. This ability is generally tested with what is called a false belief task. Although infants as young as 3 months can illustrate some understanding of the mental states of others if asked in an appropriate (nonverbal) manner (Choi et al., 2018), children do not consistently pass false belief tasks until about 4 years of age (Baillargeon et al., 2010). And, it is not

until 5 to 6 years of age that children understand second-order false beliefs: that they may have an incorrect belief about what someone else believes (Miller, 2009).

Deception is an effort to plant a false belief in someone else's mind. Not surprisingly, performance on the false belief task has been repeatedly shown to predict the ability to lie (Lee, 2013), and preschoolers who are more advanced in their understanding of others' mental states are better liars (Leduc et al., 2017). Thus, while most people do not view the ability to lie as a positive trait, it is nonetheless a developmental milestone illustrative of advances. Indeed, 3-year-old children who participated in a theory of mind training intervention were more likely to later lie than were those who did not (Ding et al., 2015).

Generally, children become capable of telling simple lies, such as claiming they received a winning card in a game (Ahern et al., 2011) or denying looking at a hidden toy they were instructed to avoid, at about 3 years of age. However, when asked follow-up questions to their lie that if answered would reveal their deception, such as what kind of toy it was, young children fail to hide their knowledge (Evans & Lee, 2013). It is not until almost 8 years of age that children become better able to think about what they should and should not know and thus conceal their transgressions more effectively (Talwar & Lee, 2002). Furthermore, as children age and become more aware of social conventions as well as others' feelings, they become more likely to lie out of politeness or a desire to avoid hurting others' feelings. For example, they are more likely to tell an experimenter that they liked an unattractive gift when in reality they did not (Xu et al., 2010).

**Distinguishing between Appearance and Reality** According to Piaget, not until about age 5 or 6 do children begin to understand the distinction between what seems to be and what is. More recent studies have found this ability emerging between 3 and 4 years of age.

In one classic series of experiments (Flavell et al., 1986), 3-year-olds seemed to confuse appearance and reality in a variety of tests. For example, when the children put on special sunglasses that made milk look green, they said the milk was green. Similarly, 3-year-olds thought that a sponge that looked like a rock was a rock, even after being shown the sponge in use (Flavell et al., 1983).

However, once again, the way in which children are asked questions affects the degree of knowledge they are able to display. For example, when children were asked questions about how to use a sponge that looked like a rock, they answered incorrectly. However, when the experimenter indicated a sponge was needed to clean up some spilled water, the children were able to hand over the correct item (Sapp et al., 2000). Later research showed that if children were presented with two objects, such as an eraser that looked like a chocolate bar and a real chocolate bar, and asked to hand an experimenter "the real one," they were able to select the correct item (Moll & Tomasello, 2012). Similarly, 3-year-old children were able to understand that an adult looking through a yellow screen at a blue object saw it as green, as evidenced by correctly selecting the blue toy after being asked, "Can you put the green one in the bag for me?" (Moll & Meltzoff, 2011). It may be that children do understand the difference between appearance and reality but have difficulty displaying their knowledge in traditional tasks that require verbal responses. When you ask them to display their knowledge via their actions, they are better able to do so.

**Distinguishing between Fantasy and Reality** Sometime between 18 months and 3 years, children learn to distinguish between real and imagined events. Three-year-olds know the difference between a real dog and a dog in a dream, and between something invisible (such as air) and something imaginary (such as a ghost). They can pretend and can tell when someone else is pretending (Flavell, 2000). By 3 and, in some cases, by age 2, they know that pretense is intentional; they can tell the difference between trying to do something and pretending to do the same thing (Rakoczy et al., 2004).

While more inclined to believe in storybook characters than older children, 3-year-olds are still skeptical about whether or not characters in books are real or pretend, especially if those books contain fantastical elements (Woolley & Cox, 2007). By the age of 4, most children, if given the choice, complete stories with real-world causal laws



*By the age of 3 or 4, children differentiate between fictional cartoon worlds. So, if Barney were to show up on Sesame Street, they would be extremely surprised (Skolnick et al., 2009).*



*Is Mickey Mouse real? The ability to distinguish fantasy from reality develops by age 3, but 4- to 6-year-olds may enjoy pretending a character is real nonetheless.*

Robert Landau/Alamy Stock Photo

Young infants are extremely interested in other people's eyes. What relationship might this have to theory of mind? What type of social information does eye gaze convey?



rather than magical or fantastical elements (Weisberg et al., 2013). Religion can influence this process. Children raised in religious households are more likely to believe the protagonists in stories with fantastical elements are real if they think the stories are religious in nature than are children raised in secular households (Corriveau et al., 2015). And, if told a particular story is a Bible story, 5-year-olds are more likely to assert magical events in the story are possible in real life (Woolley & Cox, 2007).

Magical thinking in children ages 3 and older does not seem to stem from confusion between fantasy and reality. Often magical thinking is a way to explain events that do not seem to have obvious realistic explanations (usually because children lack knowledge about them) or simply to indulge in the pleasures of pretending—as with a belief in imaginary companions. Children, like adults, generally are aware of the magical nature of fantasy figures but are more willing to entertain the possibility that they may be real (Woolley, 1997). Moreover, there are indications that imaginative activities may offer developmental benefits. In one study, children who had imaginary companions used richer and more elaborate narrative structure than children without imaginary companions when asked to recount a personal story (Trionfi & Reese, 2009). Other research has shown that children who watched a movie with magical themes later scored higher on creativity tests and drew more imaginative impossible objects, even though their beliefs about magic were unaffected (Subbotsky et al., 2010).

**Individual Differences in Theory of Mind Development** Some children develop theory of mind (TOM) abilities earlier than others. What explains these individual differences?

Infant social attention has been closely linked to TOM development. Several lines of research show that infants who are better at paying attention to others as infants show more facility with TOM tasks at 4 years of age (Wellman et al., 2008). This is particularly true for joint attention (when two people share a focus on an object) and for attention toward goal-directed actions (such as reaching for an object) (Sodian et al., 2020).

Executive functioning helps people plan, monitor, assess, and shift their goal-directed behaviors, and it is likewise associated with TOM. Culturally diverse research has revealed a consistent association between executive functioning ability and theory of mind (Devine & Hughes, 2014). However, theorists disagree on whether or not executive control is a precursor to TOM development or whether both executive control and TOM share neural structures or networks (Derksen et al., 2018).

Social competence also matters and contributes to an understanding of thoughts and emotions. Children with poor TOM skills tend to have difficulty making and keeping friends (Fink et al., 2015). By contrast, children whose teachers and peers rate them high on social skills are better able to recognize false beliefs, to distinguish between real and pretend emotion, and to take another person's point of view (Cassidy et al., 2003). Moreover, TOM predicts later social competence (Devine et al., 2016), possibly because those children who are better at TOM are better at understanding others' emotions (Grazzani et al., 2018) and are more likely to engage in prosocial behaviors (Caputi et al., 2012). Having siblings is also associated positively with TOM development (McAlister & Peterson, 2013), suggesting practice helps hone these skills. Findings such as these suggest continuity in social cognition and that skills build on each other over time.

Language is also important. Language is both a precursor to and a correlate of TOM. Moreover, the link appears to be bidirectional; children who are advanced in their early false belief reasoning later perform better on language indices than those who are not (Milligan et al., 2007). Parents' language use also matters. Parents' use of mentalistic language—language referring to others' mental states—predicts a child's own later use of mental state language (Dunn, 1991) and TOM abilities (Ebert et al., 2017). TOM has been positively related to reading storybooks, perhaps because parents and children often discuss characters and their desires, beliefs, or emotions (Mar et al., 2010).

Being bilingual can also help. Bilingual children do somewhat better on TOM tasks, particularly when they are more advanced in language development relative to other children (Schroeder, 2018). Bilingual children know that an object or idea can be rep-

resented linguistically in more than one way, and this may help them see that different people may have different perspectives. Bilingual children also recognize the need to match their language to that of their partner, making them more aware of others' mental states.

Brain development is also necessary for TOM. Some researchers have pointed to general processing mechanisms, whereas others have focused on the development of attentional and inhibitory processes (Berthiaume et al., 2013; Leslie et al., 2004). As somewhat different areas of the brain are active during different types of false belief tasks (Schurz et al., 2013), it is likely that a variety of different processes underlie children's developing abilities in this area. In particular, neural activity in the prefrontal cortex has been identified as important. Children who are able to correctly reason about the mental states of others (such as where a puppet might look for a toy airplane that was moved without its knowledge) or distinguish between appearance and reality (such as with a sponge that looks like a rock) show brain wave activation in their dorsal medial prefrontal cortex and the right temporal parietal juncture. However, those children who are not able to correctly pass the task do not (Liu et al., 2009). Moreover, age-related changes in the organization and connectivity of white matter in the brain are associated with improvements in the performance of false belief tasks, even when linguistic ability and executive functioning are controlled for. Although children who are better at TOM tasks show brain wave patterns more similar to those of adults, children's brain wave activity nonetheless differs from that of adults' and continues to change over childhood (Weismann et al., 2017; Meinhart et al., 2011).

Given its complexity, it is likely multiple areas are involved in processing TOM. For example, in one model, three processing loops that underlie TOM processing have been proposed. The cognitive network, located in the anterior cingulate cortex and medial prefrontal cortex, makes inferences about knowledge and beliefs. The affective network, located primarily in the right cortex and concentrated in the inferior frontal gyrus, makes inferences about emotions. Last, a third network combines the cognitive and affective processes in parallel and is located in the bilateral temporal lobes, extending from the posterior superior temporal gyri to the anterior temporal lobes and partially overlapping with the cognitive and affective networks. This network handles situations found in everyday social interactions, such as the identification of facial expressions in others or the understanding of a faux pas (Schurz et al., 2021).

An incomplete or ineffective theory of mind may be a sign of a cognitive or developmental impairment. Individuals with this type of impairment have difficulty determining the intentions of others, lack understanding of how their behavior affects others, and have a difficult time with social reciprocity. Research suggests that children with autism are deficient in theory of mind and that this is a core feature of autism (Baron-Cohen et al., 1985).

**Cultural Influences on Theory of Mind Development** Studies investigating the influence of culture on the development of the TOM have been contradictory. Some studies have suggested a universal timeline of development (Devine & Hughes, 2014). For example, children from fishing/gathering cultures in Micronesia and the hunter-gatherer Baka of Cameroonian rain forests, as well as children from Canada, India, Peru, Samoa, and Thailand appear to have highly similar TOM development (Oberle, 2009; Avis & Harris, 1991; Callaghan et al., 2005),

However, other studies have shown differences. For example, a meta-analysis showed children from China and Hong Kong developed TOM abilities as much as 2 years later than Western samples (Liu et al., 2008). Similar data have been discovered for Samoan children (Mayer & Trauble, 2013). Moreover, differences have emerged with respect to the pathway to proficiency. Children in Iran and China develop the abilities underlying TOM development in a different order than children in Australia and the United States (Shahaeian et al., 2014; Wellman et al., 2006).

In research on these cultural differences, no clear correlates have emerged (Devine & Hughes, 2014). Some studies have suggested differences might be driven by exposure

## checkpoint can you . . .

- Give examples of research that challenges Piaget's views on young children's cognitive limitations?
- Describe changes between ages 3 and 6 in children's knowledge about the way their minds work, and identify influences on that development?

to formal education. For instance, unschooled Mofu children from Cameroon and Tolai children from Papua New Guinea show delayed TOM development contrasted to their schooled peers, and British children, who enter school a year earlier than Italian and Japanese children, are able to pass false beliefs at an earlier age (Vinden, 1999; Hughes et al., 2014; Lecce & Hughes, 2010).

Other studies have investigated language variations across different cultural groups. For example, in Chinese, there are three different forms of the word *belief*, two of which signify the belief is false. When the neutral form of the word is used, Chinese children have a more difficult time correctly answering TOM questions. However, when the false forms of the word are used, the performance of Chinese children is more similar to that of children from Western cultures (Lee et al., 1999). These performance differences may be reflected in emerging neural architecture. Brain imaging studies have found that although some areas of the brain (such as the ventromedial prefrontal cortex) show similar activation during TOM tasks across American and Japanese children, other areas (such as the inferior frontal gyrus and the temporal parietal junction) differ across cultures (Kobayashi et al., 2007).

Parents across different cultures may also shape their children's emerging TOM understanding by how they interact with them. For instance, parents in the United Kingdom are more likely view their child as an individual with a mind rather than as an organism with needs that must be satisfied than parents in Hong Kong. And children from the United Kingdom are more advanced in TOM than those of Hong Kong, presumably because of their parents' "mind-mindedness" (Hughes et al., 2018). An authoritarian parenting style has also been associated with lower TOM performance in young children (Kunturo et al., 2017). Another candidate influence is cultural values, such as the emphasis on group harmony found in collectivistic cultures and the individual orientation found in individualistic cultures (Nisbett, 2004; Fu et al., 2008).

# Memory

During early childhood, children improve in attention and in the speed and efficiency with which they process information, and they begin to form long-lasting memories.

## BASIC PROCESSES AND CAPACITIES

Information-processing theorists focus on the processes that affect cognition. According to this view, memory can be described as a filing system that has three steps, or processes: encoding, storage, and retrieval. **Encoding** is like putting information in a folder to be filed in memory; it attaches a "code" or "label" to the information so it will be easier to find when needed. For example, if you were asked to list "things that are red," you might list apples, stop signs, and hearts. Presumably, all these items were tagged in memory with the concept "red" when they were originally encoded. This code is what now enables you to access these seemingly disparate objects. **Storage** is putting the folder away in the filing cabinet. It is where the information is kept. When the information is needed, you access storage, and through the process of **retrieval**, you search for the file and take it out.

Information-processing models depict the brain as containing three types of storage: sensory memory, working memory, and long-term memory. **Sensory memory** is a temporary storehouse for incoming sensory information. For example, the light trail that is visible when a sparkler is moved quickly on a dark night illustrates visual sensory memory. Sensory memory shows little change from infancy on. However, without processing (encoding), sensory memories fade quickly.

Information being encoded or retrieved is kept in **working memory**, a short-term storehouse for information a person is actively working on, trying to understand, remember, or think about. According to a widely used model, a central executive controls processing operations in working memory (Baddeley, 1998, 2001). The central executive orders infor-

### encoding

Process by which information is prepared for long-term storage and later retrieval.

### storage

Retention of information in memory for future use.

### retrieval

Process by which information is accessed or recalled from memory storage.

### sensory memory

Initial, brief, temporary storage of sensory information.

### working memory

Short-term storage of information being actively processed.

mation encoded for transfer to **long-term memory**, a storehouse of virtually unlimited capacity that holds information for long periods of time. The central executive also retrieves information from long-term memory for further processing. It is assisted by two subsystems: the phonological loop, which aids in the processing of verbal information, and the visuospatial sketchpad, which maintains and manipulates visual information.

Brain imaging studies have found that working memory is located partly in the prefrontal cortex (Nelson et al., 2000). Functions controlled by the **central executive** are found in a variety of regions in the frontal lobes and in some posterior, primarily parietal, areas. Functions controlled by the phonological loop are found in the left hemisphere in the inferior parietal areas and anterior temporal frontal areas, including Broca's area, the premotor cortex, and the sensory motor association cortex. Functions controlled by the visuospatial sketchpad are found in the right hemisphere in the occipital and inferior frontal areas (Gathercole et al., 2004).

The efficiency of working memory is limited by its capacity. Researchers can assess the capacity of working memory by asking children to recall a series of scrambled digits (for example, 2-8-3-7-5-1 if they heard 1-5-7-3-8-2). The capacity of working memory—in this case, the number of digits a child can recall backward—increases rapidly. At age 4, children typically remember only two digits; at 12, they typically remember six (Zelazo et al., 2003). All basic components of working memory are in place by 6 years of age and increase linearly with age until approximately 14 to 15 years of age (Gathercole et al., 2004).

Placing material in memory is not enough; it must also be retrieved to be used. Recognition and recall are types of retrieval. **Recognition** is the ability to identify something encountered before; for example, picking out a missing mitten from a lost-and-found box. **Recall** is the ability to reproduce knowledge from memory; for example, describing the mitten to someone.

## METAMEMORY

**Metamemory** is one component of **metacognition** and can be described as the knowledge of and reflection about memory processes. From kindergarten through the elementary school years, children advance steadily in understanding memory (Schneider, 2008). Kindergarteners and first graders know that people remember better if they study longer, that people forget things with time, and that relearning something is easier than learning it for the first time (Flavell et al., 2002). However, younger children tend not to use organizational memory strategies such as grouping things by categories, and they tend to overestimate their memory capacity (Karably & Zabrusky, 2009). Moreover, even when taught to use memory strategies, they tend to use those memory strategies only in the context in which they were taught and do not generalize them to other tasks.

By third grade, children know that some people remember better than others and that some things are easier to remember than others (Flavell et al., 2002), and they become more proficient in their use of memory strategies (Karably & Zabrusky, 2009). For example, they often use more than one strategy for a task, choose different kinds of strategies for different problems, and are better at assessing if they are reaching their memory goals (Schneider, 2008).

Metamemory may allow learners to calibrate whether or not the subjective assessment of the accuracy of responses (does it “feel right”) aligns with reality by monitoring failures. This ability is supported by cortical thinning in the anterior insula and an increase in the thickness of the ventromedial prefrontal cortex from childhood through adolescence (Fandakova et al., 2017). Children’s metamemory abilities continue to progress through adolescence and quite possibly longer (Van der Stel & Veenman, 2014).

## EXECUTIVE FUNCTIONING

The growth of working memory permits the development of **executive function**, the conscious control of thoughts, emotions, and actions to accomplish goals or to solve

### long-term memory

Storage of virtually unlimited capacity that holds information for long periods.

### central executive

In Baddeley's model, element of working memory that controls the processing of information.

### recognition

Ability to identify a previously encountered stimulus.

### recall

Ability to reproduce material from memory.

## checkpoint can you ...

- Identify three processes and three storehouses of memory?
- Compare recognition and recall?

### metamemory

Understanding of processes of memory.

### metacognition

Thinking about thinking, or awareness of one's own mental processes.

### executive function

Conscious control of thoughts, emotions, and actions to accomplish goals or solve problems.

**generic memory**

Memory that produces scripts of familiar routines to guide behavior.

**script**

General remembered outline of a familiar, repeated event, used to guide behavior.

**episodic memory**

Long-term memory of specific experiences or events, linked to time and place.

**autobiographical memory**

Memory of specific events in one's life.

problems (McCabe et al., 2010). Executive function enables children to plan and carry out goal-directed mental activity (Zelazo & Carlson, 2012), and it is often useful when children need to focus their attention on something or override an inappropriate response. For example, despite being eager for a turn, a child might wait in line for a slide. Executive function emerges around the end of an infant's 1st year and develops in spurts with age. Changes in executive function between ages 2 and 5 enable children to make up and use complex rules for solving problems (Zelazo et al., 2003).

Executive function may explain why working memory is positively associated with academic performance, in fact, to a greater degree than is IQ (Alloway & Alloway, 2010). These findings have held for both literacy and numeracy skills, and for children from low-income families, ethnic minority children, children born preterm, and children with attentional problems (Welsh et al., 2010; Mulder et al., 2010; Alloway et al., 2010). Because of this association, attempts have been made to increase working memory capacity via training and intervention programs. Generally, such attempts have been successful in improving working memory (Melby-Lervåg & Hulme, 2013; Diamond & Lee, 2011) and are associated with changes in brain activity and dopamine receptor density (Klingberg, 2010). Some programs, especially those focused on literacy, have shown success (Dahlin, 2011; Titz & Karbach, 2014; Holmes & Gathercole, 2014). But other programs have had difficulty with the generalizability of training to other areas and have not resulted in academic gains (Rapport et al., 2013; Dunning et al., 2013), and some have even shown declines in academic performance as a result of training (Roberts et al., 2016).

## CHILDHOOD MEMORIES



*"Remember when we all played in the snow together last winter?" Young children are most likely to remember unique events and may recall details from a special trip for a year or longer.*

Don Hammond/Design Pics

Memory of experiences in early childhood is rarely deliberate: young children simply remember events that made a strong impression. Most of these early conscious memories seem to be short-lived.

**Generic memory**, which begins at about age 2, produces a **script**, or general outline of a familiar, repeated event, such as riding the bus to preschool or having lunch at Grandma's house. It helps a child know what to expect and how to act.

**Episodic memory** refers to awareness of having experienced a particular event at a specific time and place. Given a young child's limited memory capacity, episodic memories are temporary. Unless they recur several times (in which case they are transferred to generic memory), they last for a few weeks or months and then fade. For example, getting vaccinated at the pediatrician's office might originally be an episodic memory—a child might remember the particular event. Over time and repeated visits, a child might form a generic memory of the doctor's office being a place where shots are administered.

**Autobiographical memory**, a type of episodic memory, refers to memories of distinctive experiences that form a person's life history. Not everything in episodic memory becomes part of autobiographical memory—only those memories that have a special, personal meaning to the child (Fivush, 2011). Autobiographical memory generally emerges between ages 3 and 4. A suggested explanation for the relatively slow arrival of autobiographical memory is that children cannot store in memory events pertaining to their own lives until they develop a concept of self. Also critical is the emergence of language, which enables children to share memories and organize them into personal narratives (Nelson, 2005).

**Influences on Memory Retention** When events are rare or unusual, children seem to remember them better (Peterson, 2011). Children, as they get older, are also more likely to remember unique details of an event they have a generic script for (Brubacher et al., 2011). Moreover, events

with emotional impact seem to be remembered better (Buchanan, 2007), although some evidence suggests attention is focused on central aspects of the situation rather than on peripheral details (Levine & Edelstein, 2009). So, for example, if you were frightened by a scary film, you might show enhanced memory for events in the film but forget if you bought candy or who you saw the film with. Still another factor is children's active participation. Preschoolers tend to remember things they did better than things they merely saw (Murachver et al., 1996).

The way adults talk with a child about experiences strongly affects autobiographical memory. The **social interaction model**, based on Vygotsky's sociocultural approach, provides a rationale. Theorists argue that children collaboratively construct autobiographical memories with parents or other adults as they talk about events, such as might occur when a mother and child leaf through a photo album and talk about past events. Indeed, parents who spend more time reminiscing about and discussing past events have children who form more coherent autobiographical memories (Fivush et al., 2011).

The relationship between elaborative, parent-guided reminiscing and children's autobiographical memory has been replicated widely across cultures. However, mothers in middle-class Western cultures tend toward more elaboration than mothers in non-Western cultures (Fivush & Haden, 2006). In reminiscing with 3-year-olds, US mothers might say, "Do you remember when you went swimming at Nana's? What did you do that was really neat?" Chinese mothers tend to ask leading questions, leaving little new information for the child to add ("What did you play at the place of skiing? Sat on the ice ship, right?") (Nelson & Fivush, 2004).

#### **social interaction model**

Model, based on Vygotsky's sociocultural theory, that proposes children construct autobiographical memories through conversation with adults about shared events.

#### **checkpoint** can you . . .

- ▶ Identify three types of early memories and four factors that affect retention?
- ▶ Discuss how social interaction and culture influence memory?

## Intelligence

Although the definition of intelligence is controversial, most psychologists agree that intelligence involves the ability to learn from situations, adapt to new experiences, and manipulate abstract concepts.

### PSYCHOMETRIC MEASURES OF INTELLIGENCE

The two most commonly used individual intelligence tests for preschoolers are the Stanford-Binet Intelligence Scale and the Wechsler Preschool and Primary Scale of Intelligence. These tests, beginning at age 5, tend to be fairly reliable in predicting measured intelligence and school success later in childhood.

The **Stanford-Binet Intelligence Scales** are used for ages 2 and up and take 45 to 60 minutes. The child is asked to define words, string beads, build with blocks, identify the missing parts of a picture, trace mazes, and show an understanding of numbers. The child's score is supposed to measure fluid reasoning (the ability to solve abstract or novel problems), knowledge, quantitative reasoning, visual-spatial processing, and working memory. The 5th edition includes nonverbal methods of testing all five of these dimensions of cognition and permits comparisons of verbal and nonverbal performance. In addition to providing a full-scale IQ, the Stanford-Binet yields separate measures of verbal and nonverbal IQ plus composite scores spanning the five cognitive dimensions.

The **Wechsler Preschool and Primary Scale of Intelligence, Revised (WPPSI-IV)** is an individual test that takes 30 to 60 minutes. It has separate levels for ages 2½ to 4 and 4 to 7, and it yields separate verbal and performance scores as well as a combined score. The most current version includes subtests designed to measure both verbal and nonverbal fluid reasoning, receptive versus expressive vocabulary, and processing speed. The WPPSI-IV has been validated for special populations, such as children with intellectual disabilities, developmental delays, language disorders, and autistic disorders.

#### **Stanford-Binet Intelligence Scales**

Individual intelligence tests for ages 2 and up used to measure fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory.

#### **Wechsler Preschool and Primary Scale of Intelligence, Revised (WPPSI-IV)**

Individual intelligence test for children, which yields verbal and performance scores as well as a combined score.

### INFLUENCES ON MEASURED INTELLIGENCE

A common misconception is that IQ scores represent a fixed quantity of inborn intelligence. In reality, an IQ score is simply a measure of how well a child can do certain

tasks at a certain time in comparison with other children of the same age. IQ can be used to identify both gifted children and children who need extra assistance. Because most tests have been in use for some time, they are standardized, normed, and reliable. They can be used to predict academic achievement.

Test scores of children in many industrialized countries have risen steadily since testing began, forcing test developers to raise standardized norms (Flynn, 1984, 1987). This trend reflects better nutrition, preschools, better-educated parents, smaller families in which each child received more attention, and changes in the tests themselves. Although the trend slowed in 1970s and 1980s (Sundet et al., 2004; Teasdale & Owen, 2008), recent meta-analyses suggest that average IQ continues to rise at a rate of 2.3 points per decade (Trahan et al., 2014).

The degree to which family environment influences a child's intelligence is difficult to specify. Some of parents' influence on intelligence comes from their genetic contribution, and some results from the fact that they provide a child's earliest environment for learning. Twin and adoption studies suggest that family life has its strongest influence on IQ in early childhood, and this influence diminishes greatly by adolescence (Bouchard, 2013; Haworth et al., 2010).

The correlation between socioeconomic status and IQ is well documented (Strenze, 2007; Falk et al., 2021). Family income is associated with cognitive development and achievement in the preschool years and beyond. Family economic circumstances can exert a powerful influence, not so much in themselves as in the way they affect other factors such as health, stress, parenting practices, and the atmosphere in the home (Jenkins et al., 2017). Being born to a poor family does not, however, mean children will necessarily have a lower IQ. Having parents who are nurturing and tolerant exerts a protective effect on the child (Jung et al., 2018). For example, although children in economically deprived families do tend to have lower IQs, poor children with an outgoing temperament, warm mothering, and stimulating activities in the home tend to do better than other economically deprived children (Kim-Cohen et al., 2004).

Children at risk may be more influenced by negative environments. For example, research has shown that children with low IQ show greater negative effects as a result of low socioeconomic status than do those with high IQ (Hanscombe et al., 2012). Additionally, the strength of environmental effects can vary as a function of risk. So, for instance, the IQ of children from homes of higher economic status is more strongly affected by genetic influences, while the IQ of children from homes of the lowest socioeconomic status is driven more by environmental deprivation (Turkheimer et al., 2003). However, this is not universally true. When environments change, so too can the influences. In the United States, where low socioeconomic status is associated with greater deprivation, poverty and IQ are closely associated. Poor children in the United States do not show strong genetic influences on intelligence, although children from more affluent homes do. However, in countries with more robust social services, such as the Netherlands, the links between genes and intelligence remain strong for children who live in poverty (Tucker-Drob & Bates, 2016). Presumably this is because despite living in poverty, they nonetheless have access to enriching experiences and thus are able to express their innate abilities.

Exposure to television during the first few years of life has been negatively associated with academic outcomes and cognitive development, especially when the television is left on for long periods. The strongest links are found in children who started watching television under the age of 3 years, who come from disadvantaged backgrounds, and who are exposed to adult content. However, the type of programming is important. High-quality children's programming can result in cognitive enhancements (Kostyrka-Allcorne et al., 2017). For example, *Sesame Street*, developed specifically to improve school readiness in inner-city children, is associated with a host of positive outcomes, including cognitive proficiency, literacy, and numeracy (Mares & Pan, 2013). Similar findings have emerged for other educational programming such as *Blue's Clues* and *Dora the Explorer* (Kirkorian et al., 2008). Additionally, parents who limit screen time, select well-designed, age-appropriate programs, and view the programs with their children can maximize the benefits of media.

## TESTING AND TEACHING BASED ON VYGOTSKY'S THEORY

According to Vygotsky, children learn through interactions with others. This interactive learning is most effective in helping children cross the **zone of proximal development (ZPD)**, the imaginary psychological space between what children can do or know by themselves and what they could do or know with help. The ZPD can be assessed by dynamic tests that, according to Vygotskian theory, provide a better measure of children's intellectual potential than do traditional psychometric tests. Examiners help the child when necessary by asking questions, giving examples or demonstrations, and offering feedback, making the test itself a learning situation.

The ZPD, in combination with the related concept of **scaffolding**, can help parents and teachers more efficiently guide children's cognitive progress. Scaffolding is the supportive assistance that a more sophisticated interaction partner provides, and ideally, it should be aimed at the ZPD. For example, consider what happens when you are trying to learn a new skill, such as playing pool. When you play with someone who is worse than you, you are not likely to improve. Likewise, when you play with someone who is a master, their skills are so above yours that they overwhelm you. However, playing with someone who is just a bit better than you is likely to challenge you, illustrate strategies you might be successful at, and result in the greatest amount of learning.

Ideally, scaffolding is lessened as children gain in skills. The less able a child is to do a task, the more scaffolding, or support, an adult must give. As the child can do more and more, the adult helps less and less. When the child can do the job alone, the adult takes away the scaffold that is no longer needed.

Scaffolding helps children learn. For example, first-grade students struggling with reading showed greater gains in their abilities when their teachers prompted them to use sources of information they were ignoring to decode difficult words when they got stuck (Rodgers et al., 2016). Similarly, teachers who scaffolded the group discussions of their fourth-grade classrooms had students who later modeled their behavior on that of the teachers', for example, by remembering to use evidence to support their statements (Jadallah et al., 2011). The influence of teacher scaffolding does not just extend to academics. Preschoolers whose teachers provide social scaffolding, for instance by suggesting a compromise to children fighting over the same toy, have more positive and fewer negative interactions (Acar et al., 2017).

Given the positive relationship between scaffolding and academic achievement, interventions have been used as a means by which to promote cognitive development. For example, one intervention with Pakistani children showed increases in maternal scaffolding at 2 years of age predicted cognitive skills at 4 years of age (Obradović et al., 2016). It appears likely that the cognitive gains are mediated by executive functioning skills (Jeong et al., 2019). In other words, maternal scaffolding may positively affect executive functioning in young children, which is in turn associated with academic achievement.



*By giving suggestions for solving a puzzle until his son can do it on his own, this father scaffolds his child's cognitive progress.*

Africa Studio/Shutterstock

### zone of proximal development (ZPD)

Vygotsky's term for the difference between what a child can do alone and what the child can do with help.

### scaffolding

Temporary support to help a child master a task.

Vygotsky believed play provided children with scaffolding, enabling them to work at the higher end of their ZPD. If asked to pretend to be a statue, children are able to stand still longer than if asked to just remain motionless. The "rules" of being a statue provide support for the emerging regulatory abilities of the children.



### checkpoint can you . . .

- Describe two individual intelligence tests for preschoolers?
- Discuss the relationship between SES and IQ?
- Explain how a test score based on the ZPD differs from a psychometric test score?

# Language Development

Parents living in poverty speak less to their children as the end of the month draws closer, presumably because the financial stress of their diminishing funds shifts their attention away from their children (Ellwood-Lowe et al., 2020).



Between ages 3 and 6, children make rapid advances in vocabulary, grammar, and syntax. The child who, at 3, describes how Daddy “goed” to the store or asks Mommy to “piece” her food (cut it into little pieces) may, by age 5, tell her mother, “Don’t be ridiculous!” or proudly point to her toys and say, “See how I organized everything?”

## VOCABULARY

At age 3, the average child knows and can use 900 to 1,000 words. By age 6, a child typically has an expressive (speaking) vocabulary of 2,600 words and understands more than 20,000. With the help of formal schooling, a child’s passive, or receptive, vocabulary (words they can understand) will quadruple to 80,000 words by the time they enter high school (Owens, 1996).

Socioeconomic status affects this process. Children living in poverty fall behind their more affluent peers in the number of words they know by 18 months of age, presumably due to their hearing fewer and less complex words than children from wealthier homes (Hart & Risley, 2003; Fernald et al., 2013).

The rapid expansion of vocabulary occurs through **fast mapping**, which allows a child to pick up the approximate meaning of a new word after hearing it only once or twice in conversation (Spiegel & Halberda, 2011). Using the context, children seem to form a quick hypothesis about the meaning of the word. For example, suppose a child is at the zoo and encounters an emu for the first time. The mother might point to the emu and say, “Look at the emu over there.” The child might use what they know about the rules for forming words, about the context, and about the subject to form a hypothesis about the meaning of the word *emu*. Names of objects (nouns) seem to be easier to fast map than names of actions (verbs), even across different languages (Imai et al., 2008).

## GRAMMAR AND SYNTAX

The ways children combine syllables into words and words into sentences grow increasingly sophisticated during early childhood as their understanding of grammar and syntax becomes more complex. When psychologists speak of grammar, they are referring to the deep underlying structure of a language that enables us to both produce and understand utterances. Syntax is a related concept and involves the rules for putting together sentences in a particular language.

At age 3, children typically begin to use plurals, possessives, and past tense and know the difference between *I*, *you*, and *we*. They can ask—and answer—what and where questions. However, their sentences are generally short, simple, and declarative (“Kitty wants milk”).

Between ages 4 and 5, sentences average four to five words and may be declarative (“I’m a girl”), negative (“I’m not hungry”), interrogative (“Why can’t I go outside?”), or imperative (“Catch the ball!”). Four-year-olds use complex, multiclause sentences (“I’m eating because I’m hungry”) more frequently if their parents often use such sentences (Huttenlocher et al., 2002). Children this age tend to string sentences together in long, run-on stories (“. . . And then . . . And then . . .”).

In some respects, comprehension may be immature. For example, 4-year-old Noah can carry out a command that includes more than one step (“Pick up your toys and put them in the cupboard”). However, if his mother tells him, “You may watch TV after you pick up your toys,” he may process the words in the order in which he hears them and think he can first watch television and then pick up his toys.

By ages 5 to 7, children’s speech has become quite adultlike. They speak in longer and more complicated sentences. They use more conjunctions, prepositions, and articles. They use compound and complex sentences and can handle all parts of speech.

Still, although children this age speak fluently, comprehensibly, and fairly grammatically, they have yet to master many fine points of language. They rarely use the passive voice (“I was dressed by Grandpa”), conditional sentences (“If I were big, I could drive the bus”), or the auxiliary verb *have* (“I have seen that lady before”) (Chomsky, 1969).

Young children often make errors because they have not yet learned exceptions to rules. Saying “held” instead of “held” or “ate” instead of “ate” is a normal sign of linguistic progress. When young children discover a rule, such as adding *-ed* to a verb for past tense, they tend to overgeneralize—to use it even with words that do not conform to the rule. Eventually, they notice that *-ed* is not always used to form the past tense of a verb and correct their speech.

## PRAGMATICS AND SOCIAL SPEECH

Language is a social process. As children learn vocabulary, grammar, and syntax, they also become more competent in **pragmatics**. Pragmatics involves the practical knowledge of how to use language to communicate. When Amalia was 3, she would ask for a cookie by demanding, “Cookie now!” However, as she got older, she realized that asking “Momma, can I have a cookie please?” was far more effective.

With improved pronunciation and grammar, it becomes easier for others to understand what children say. Most 3-year-olds are talkative, and they pay attention to the effect of their speech on others. If people cannot understand them, they try to explain themselves more clearly. Four-year-olds, especially girls, simplify their language and use a higher register when speaking to 2-year-olds (Shatz & Gelman, 1973).

Most 5-year-olds can adapt what they say to what the listener knows. They can now use words to resolve disputes, and they use more polite language and fewer direct commands in talking to adults than to other children. Almost half of 5-year-olds can stick to a conversational topic for about a dozen turns—if they are comfortable with their partner and if the topic is one they know and care about.

Overall language development—in terms of vocabulary and grammar—as well as theory of mind are positively associated with pragmatic development (Mathews et al., 2018). There are also gender differences. Boys tend to use more controlling statements, negative interruptions, and competitive statements, whereas girls phrase their remarks in a more tentative, conciliatory way and are more polite and cooperative (Leman et al., 2005; Cook-Gumperz & Syzmanski, 2001).

### pragmatics

(1) The practical knowledge needed to use language for communicative purposes. (2) The social context of language.

## PRIVATE SPEECH

Clara, age 4, was alone in her room, building a house from a set she had received for her birthday. Puzzling over the box, she was overheard saying aloud, “Now the blue blocks have to go on the sides. There are four of them on each side.”

**Private speech**—talking aloud to oneself with no intent to communicate with others—is normal and common in childhood. Theorists have disagreed on the precise nature of private speech. Piaget (1962) saw private speech—what he called egocentric speech—as a sign of cognitive immaturity. He believed that children were simply vocalizing whatever was on their minds. Vygotsky (1962) viewed private speech as a special form of communication: conversation with the self. He believed private speech was part of the learning process.

Research generally supports Vygotsky. There is evidence for the role of private speech in self-regulation (Day & Smith, 2013). Private speech tends to increase when children are trying to solve problems or perform difficult tasks, especially without adult supervision (Berk, 1992). The use of private speech in young children also predicts their autobiographical memory (Al-Namlah, Meins, & Fernyhough, 2012), creativity (Daugherty & White, 2008), and spelling proficiency (Aram et al., 2014). Findings such as these support Vygotsky’s view that private speech was part and parcel of learning, rather than Piaget’s view that it was merely reflecting ongoing mental activity.

### private speech

Talking aloud to oneself with no intent to communicate with others.

## SPEECH AND LANGUAGE DELAYS

About 11 percent of 3- to 6-year-old children have a communication disorder, most frequently a problem with speech or language (Black et al., 2015). Primary language delays include problems with speech, expressive language disorder (difficulties in producing speech), and receptive language disorder (problems with understanding language). Secondary language delays are the result of another cause, such as hearing problems, cognitive impairment, autism, head and facial abnormalities, or selective mutism (McLaughlin, 2011).

Some risk factors are medical in nature and include birth complications leading to oxygen deprivation; preterm delivery; seizure disorders; some developmental delays; deformities in the head, mouth, and face; or hearing loss. Other risk factors are familial, such as low parental education, inadequate stimulation, having family members with speech and language problems, and low socioeconomic status (Sunderajan & Kanhere, 2019; Anne et al., 2017; Franken et al., 2012). Heredity seems to play a major role (Mountford & Newbury, 2019), and boys are more likely than girls to have language delays (Adani & Cepanec, 2019).

Many children who speak late, especially those whose comprehension is normal, eventually catch up. One of the largest studies to date on language emergence determined that 80 percent of children with language delays at age 2 catch up with their peers by age 7 (Rice et al., 2008). However, some 40 to 60 percent of children with early language delays, if left untreated, may experience far-reaching cognitive, social, and emotional consequences (McLaughlin, 2011).

## EMERGENT LITERACY

While for all typically developing children, language is as natural as learning how to grasp a rattle or walk, we are not designed by natural selection for literacy. Rather, reading borrows from a variety of systems—vision, audition, memory, language, motor skills, and more. It is a testament to our flexibility and intelligence as a species that most children readily learn to read; however, it is not an easy or natural task. **Emergent literacy** refers to the development of these skills. Language is necessary for literacy, but it is by no means enough.

Social interaction promotes emergent literacy. Children are more likely to become good readers and writers if, during the preschool years, parents provide appropriate conversational challenges: if they use a rich vocabulary, read and talk about books, and center dinner-table talk on the day's activities, on mutually remembered past events, or on questions about why people do things and how things work (Reese et al., 2010). Similar positive effects are found for preschool teachers. Children whose preschool teachers used sophisticated vocabulary during free play had larger vocabularies and better reading comprehension in fourth grade, providing they had good receptive vocabulary in kindergarten (Dickinson & Porsche, 2011).

Reading to children is one of the most effective paths to literacy (Evans & Shaw, 2008). Approximately 85 percent of US children age 3 to 5 and not in kindergarten are read to three or more times a week by a family member (Federal Interagency Forum on Child and Family Statistics, 2021). Children who are read to from an early age learn that reading and writing in English move from left to right and from top to bottom and that words are separated by spaces. They also are motivated to learn to read (Whitehurst & Lonigan, 2001; Baker, 2013), and that interest helps them become better readers (Carroll et al., 2019).

### emergent literacy

Preschoolers' development of skills, knowledge, and attitudes that underlie reading and writing.



Toys and games that familiarize children with the alphabet and the sounds the letters make can give them a head start in learning to read.

Oksana Kuzmina/Shutterstock

The increasing use of technology and media devices by young children is likely to be an influence. There are suggestions that parent-child interactions may be altered (Korat & Or, 2010) or interrupted (Parish-Morris et al., 2013) when reading is conducted on electronic devices. However, when high-quality, interactive apps are used and when parents scaffold their children's learning, technologically mediated instruction has the potential to promote emergent literacy (Neumann & Neumann, 2017).

*US booksellers have noted a trend away from picture books and toward chapter books for young children, presumably as a result of parents' concerns about literacy (Bosman, 2010). Do you think chapter books with fewer pictures and more text help develop children's imagination, or do they push children too quickly?*



## checkpoint can you . . .

- Trace normal progress in 3- to 6-year-olds' vocabulary, grammar, syntax, and conversational abilities?
- Give reasons why children use private speech?
- Discuss possible causes, consequences, and treatment of delayed language development?
- Identify factors that promote preparation for literacy?

# Early Childhood Education

Going to preschool is an important step, widening a child's physical, cognitive, and social environment. The transition to kindergarten, the beginning of "real school," is another momentous step. Let's look at both of these transitions.

## CULTURAL VARIATIONS IN EARLY EDUCATION

There are wide global variations in the proportion of children who attend preschool, as well as in the cultural ideals and skills taught to young children. In Western countries such as the United States, 83 percent of young children are enrolled in some form of preschool program. In low-income countries, only 22 percent of children are able to access this experience, and socioeconomic disparities within low-income countries mean poor children are 8 times less likely to be enrolled in preschool than are children from wealthy families. Only 12 percent of children in low-income countries who do not attend preschool will be on track for literacy and numeracy skills, as compared with 44 percent of their preschool-attending peers. Globally, half of preschool-age children—roughly 175 million—are not enrolled in preschool (UNICEF, 2019). The limited early childhood educational opportunities for many of these children perpetuate a cycle of poverty and inequality.

Preschools in different countries also vary with respect to their developmental goals and socialization practices. In some countries, such as the United States, Denmark, and Greece, play is viewed as essential for social and emotional development. In other countries, such as Italy, Cyprus, and Turkey, play is believed to serve academic purposes. Some cultures, such as hunter-gatherer cultures and Asian countries, are more likely to view play as separate from developmental processes (Rentzou et al., 2019; Roopnarine, 2011). Not surprisingly, American preschools stress exploring the environment, choice, having fun, and self-expression. By contrast, preschools in China, Japan, and France focus more closely on disciplined learning and following rules (Tobin et al., 1991; Tobin et al., 2009).

## PRESCHOOL

Preschools vary greatly in their goals and curriculums. Some programs emphasize academic achievement, and others focus on social and emotional development.

The Montessori method is based on the belief that children's natural intelligence involves rational, spiritual, and empirical aspects. Montessori stresses the importance of

children learning independently at their own pace in multiage classrooms as they work with developmentally appropriate materials and self-chosen tasks. Teachers serve as guides, and older children help younger ones (Montessori, 2004).

The Reggio Emilia approach is a less formal model than Montessori. Teachers follow children's interests and support them in exploring and investigating ideas and feelings through words, movement, dramatic play, and music. Teachers ask questions that draw out children's ideas and then create flexible plans to explore these ideas with the children. Classrooms are carefully constructed to offer complexity, beauty, organization, and a sense of well-being (Ceppi & Zini, 1998; Edwards, 2002).

Another type of preschool involves compensatory programs. The best known of the early intervention programs in the United States is Project Head Start, a federally funded program launched in 1965. Head Start provides medical, dental, and mental health care; social services; and at least one hot meal a day. Since its inception, Head Start has served more than 37 million children and their families. In 2019, almost a million families participated, 37 percent of whom were Hispanic and 30 percent of whom were Black. About 72.1 percent of Head Start children are from English-speaking homes, and 13 percent of enrolled children were diagnosed with disabilities (Administration for Children and Families, 2019).

Generally, research has shown that children who are enrolled in compensatory preschool programs show academic and social gains in multiple, but not all, target areas immediately following their participation. Head Start children make gains in vocabulary, letter recognition, early writing, early mathematics, and social skills (Figure 3). Some research suggests these gains are not maintained over time. However, an analysis of long-term effects of Head Start suggests that even though benefits lessen with time (Ludwig & Phillips, 2007), the benefits still outweigh the costs (Puma et al., 2012). Children from Head Start and other compensatory programs were less likely to be placed in special education or to repeat a grade and were more likely to finish high school than

low-income children who did not attend such programs (McCoy et al., 2017). "Graduates" of similar programs were also less likely to become juvenile delinquents or to become pregnant in their teens (Schweinhart, 2007), were more likely to attain a higher level of education and income, and were less likely to become involved with the criminal justice system or experience substance abuse (Reynolds et al., 2011). Outcomes are best with earlier and longer-lasting intervention through high-quality, center-based programs (Brooks-Gunn, 2003; Zigler & Styfco, 2001).

Another type of preschool is universal preschool, a national system for early care and education using the public schools. The goal of programs such as this is to improve school readiness and educational success by (1) providing access to high-quality child care and developmentally appropriate preschool, especially for low- or middle-income children, (2) building parent involvement, and (3) providing support services for parents that enhance family functioning. Critics argue the cost is too high and protest tax increases to fund them. However, research on such programs demonstrates they are highly beneficial to children and have benefit-to-cost ratios indicating the money is well-spent (Dietrichson et al., 2020).

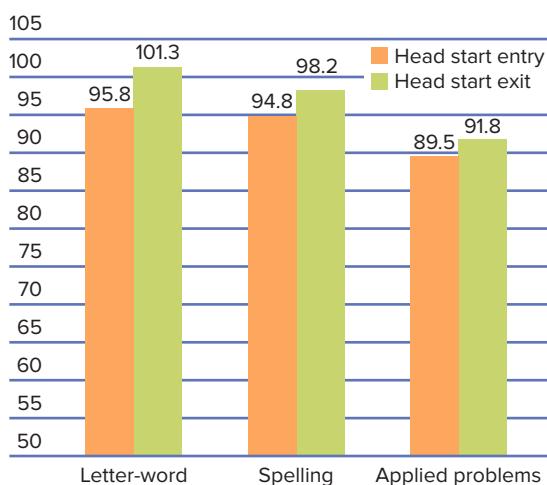
In the United States, 44 states as well as the District of Columbia provide some form of publicly funded preschool, serving about 1.64 million 3- to 4-year-olds. In 2020, 6.3 percent of 3-year-olds and just over a third of 4-year-olds were enrolled in preschool. Quality and access vary widely. Despite disparities in funding and access across states, the overall trend in recent years has been toward increased commitment for universal preschool. However, the COVID-19 pandemic made access to preschool problematic for many families, leading to reductions in national enrollment. The long-term effects of the pandemic remain to be seen (National Institute for Early Education Research, 2020).

**FIGURE 3**

### Academic Outcomes at the Beginning and End of Head Start

*These outcomes represent all children who entered Head Start for the first time in the fall of 2009, completed 1 or 2 years of the program, and entered kindergarten in the fall of either 2010 or 2011. Immediate gains are most striking; however, better outcomes do persist over time.*

Mean standard score



Source: Aikens et al. (2013).

## KINDERGARTEN

Although only 13 states require kindergarten programs or kindergarten attendance, most 5-year-olds attend kindergarten (Parker et al., 2016). Since the late 1970s, an increasing number of kindergarteners spend a full day in school, rather than the traditional half day (Kena et al., 2014). A practical impetus for this trend is the growing number of single-parent and dual-earner households.

Emotional and social adjustment affects readiness for kindergarten and strongly predict school success. It is important that children have the ability to sit still, follow directions, wait their turn, and regulate their own learning (Raver, 2003). Broadly, kindergarten readiness is associated with positive academic and social outcomes for children (Goldstein et al., 2017; Jones et al., 2015).

Some children are asked to repeat kindergarten, generally out of the belief that a second year of kindergarten will help children gain the skills they need to keep up. Low-SES children, boys, children who are low in school readiness or did not attend preschool, nonnative English speakers, and those with developmental delays are most likely to repeat kindergarten (Winsler et al., 2012; Malone et al., 2006). However, it is unclear if there are academic benefits to retention. There are indications it may be best to delay entry into kindergarten rather than retain a student for an additional year (Mendez et al., 2014).



Children who, at 6 years of age, say they like school score higher on standardized tests and get better grades as teens (Morris et al., 2021).

### checkpoint can you ...

- Compare goals and effectiveness of varying types of preschool programs?
- Assess the benefits of compensatory preschool education?
- Discuss factors that affect adjustment to kindergarten?

# summary and key terms

## PHYSICAL DEVELOPMENT

### Aspects of Physical Development

- Physical growth continues during the years from 3 to 6 but more slowly than during infancy and toddlerhood. Boys are on average slightly taller, heavier, and more muscular than girls. Internal body systems are maturing.
- Sleep patterns change during early childhood, as throughout life, and are affected by cultural expectations. Occasional sleepwalking, sleep terrors, and nightmares are common, but persistent sleep problems may indicate emotional disturbances.
- Bed-wetting is usually outgrown without special help.
- Brain development continues steadily throughout childhood and affects motor development.
- Children progress rapidly in gross and fine motor skills, developing more complex systems of action.
- Handedness is usually evident by age 3, reflecting dominance by one hemisphere of the brain.

**night terror** (193)

**sleepwalking** (193)

**sleepalking** (193)

**nightmare** (193)

**enuresis** (193)

**gross motor skills** (194)

**fine motor skills** (194)

**systems of action** (194)

**handedness** (196)

### Health and Safety

- Although major contagious illnesses are rare today in industrialized countries due to widespread immunization, preventable disease continues to be a major problem in the developing world.
- The prevalence of obesity among preschoolers has increased.
- Undernutrition can affect all aspects of development.
- Children's oral health can be improved when they are provided with regular dental care and fluoride supplements.
- Food allergies are becoming increasingly common.
- Accidents, most frequently in the home, are the leading cause of death in childhood in the United States.
- Environmental factors such as exposure to poverty, homelessness, smoking, air pollution, and pesticides increase the risks of illness or injury. Lead poisoning can have serious physical, cognitive, and behavioral effects.

**dental caries** (199)

# COGNITIVE DEVELOPMENT

## Piagetian Approach

- Children in the preoperational stage show several important advances, as well as some immature aspects of thought.
- The symbolic function enables children to reflect on people, objects, and events that are not physically present. It is shown in deferred imitation, pretend play, and language.
- Symbolic development helps preoperational children make more accurate judgments of spatial relationships. They can link cause and effect with regard to familiar situations, understand the concept of identity, categorize, compare quantities, and understand principles of counting.
- Preoperational children appear to be less egocentric than Piaget thought.
- Centration keeps preoperational children from understanding principles of conservation. Their logic also is limited by irreversibility and a focus on states rather than transformations.
- Theory of mind, which develops markedly between ages 3 and 5, includes awareness of a child's own thought processes, social cognition, understanding that people can hold false beliefs, ability to deceive, ability to distinguish appearance from reality, and ability to distinguish fantasy from reality.
- Maturational and environmental influences affect individual differences in theory-of-mind development.

**preoperational stage** (203)

**symbolic function** (204)

**pretend play** (204)

**transduction** (205)

**animism** (205)

**centration** (206)

**decenter** (206)

**egocentrism** (206)

**conservation** (207)

**irreversibility** (207)

**theory of mind** (208)

## Memory

- Information-processing models describe three steps in memory: encoding, storage, and retrieval.
- Although sensory memory shows little change with age, the capacity of working memory increases greatly. The central executive controls the flow of information to and from long-term memory.
- At all ages, recognition is better than recall, but both increase during early childhood.

- Early episodic memory is only temporary; it fades or is transferred to generic memory.
- Autobiographical memory typically begins at about age 3 or 4; it may be related to self-recognition and language development.
- According to the social interaction model, children and adults co-construct autobiographical memories by talking about shared experiences.
- Children are more likely to remember unusual activities that they actively participate in. The way adults talk with children about events influences memory formation.

**encoding** (212)

**storage** (212)

**retrieval** (212)

**sensory memory** (212)

**working memory** (212)

**long-term memory** (213)

**central executive** (213)

**recognition** (213)

**recall** (213)

**metamemory** (213)

**metacognition** (213)

**executive function** (213)

**generic memory** (214)

**script** (214)

**episodic memory** (214)

**autobiographical memory** (214)

**social interaction model** (215)

## Intelligence

- The two most commonly used psychometric intelligence tests for young children are the Stanford-Binet Intelligence Scales and the Wechsler Preschool and Primary Scale of Intelligence, Revised (WPPSI-IV).
- Intelligence test scores have risen in industrialized countries.
- Intelligence test scores may be influenced by a number of factors, including the home environment and SES.
- Newer tests based on Vygotsky's concept of the zone of proximal development (ZPD) indicate immediate potential for achievement.

**Stanford-Binet Intelligence Scales** (215)

**Wechsler Preschool and Primary Scale of Intelligence, Revised (WPPSI-IV)** (215)

**zone of proximal development (ZPD)** (217)

**scaffolding** (217)

## Language Development

- During early childhood, vocabulary increases greatly, and grammar and syntax become fairly sophisticated. Children become more competent in pragmatics.
- Private speech is normal and common; it may aid in the shift to self-regulation.
- Causes of delayed language development are unclear. If untreated, language delays may have serious cognitive, social, and emotional consequences.
- Interaction with adults can promote emergent literacy.
- Well-designed, age-appropriate programming is associated with enhanced cognitive development.

**fast mapping** (218)

**pragmatics** (219)

**private speech** (219)

**emergent literacy** (220)

## Early Childhood Education

- Goals of preschool education vary across cultures.
- The academic content of early childhood education programs in the United States has increased, but studies support a child-centered approach.
- Compensatory preschool programs have had positive outcomes. Compensatory programs that start early may have better results.
- Many children today attend full-day kindergarten. Success in kindergarten depends largely on emotional and social adjustment and prekindergarten preparation.

## outline

- The Developing Self
- Gender
- Play
- Parenting
- Relationships with Other Children

## learning objectives

- Discuss emotional and personality development in early childhood.
- Discuss gender development in early childhood.
- Describe play in early childhood.
- Explain how parenting practices influence development.
- Evaluate young children's relationships with siblings and peers.

# Psychosocial Development in Early Childhood



Miriel Thomas Reneau

## did you know?

- Young children find it hard to understand that they can have conflicting emotions.
- Gender preferences in toys and playmates appear as early as 12 to 24 months.
- Children with imaginary companions are usually more socially competent.

*In this chapter, we discuss preschool children's understanding of themselves and their feelings. We see how their sense of gender identity arises and how variations in this journey look early in life. We describe play, the activity in which children in industrialized countries typically spend most of their time. We consider the influence, for good or ill, of what parents do. Finally, we discuss relationships with siblings and other children.*



**P**lay is often talked about as if it were a relief from serious learning. But for children, play is really the work of childhood.

—Fred Rogers (1928–2003)

## The Developing Self

### THE SELF-CONCEPT AND COGNITIVE DEVELOPMENT

The **self-concept** is our total picture of our abilities and traits—who we think we are and how we feel about who we are (Harter, 1996). The sense of self also has a social aspect: Children incorporate into their self-image their growing understanding of how others see them.

**Changes in Self-Definition** Children's **self-definition**—the way they describe themselves—typically changes between about ages 5 and 7, reflecting self-concept development and advances in cognitive abilities. At age 4, Jason says,

My name is Jason and I live in a big house with my mother and father and sister, Lisa. I have a kitty that's orange and a television set in my own room. . . . I like pizza and I have a nice teacher. I can count up to 100, want to hear me? I love my dog, Skipper. I can climb to the top of the jungle gym, I'm not scared! Just happy. You can't be happy *and* scared, no way! I have brown hair, and I go to preschool. I'm really strong. I can lift this chair, watch me! (Harter, 1996, p. 208)

The way Jason describes himself is typical of American children his age. He talks mostly about concrete, observable behaviors; external characteristics, such as physical features; preferences; possessions; and members of his household. He mentions a particular skill (climbing) rather than general abilities (being athletic). His self-descriptions are unrealistically positive. He has difficulty understanding how conflicting emotions can exist simultaneously. Not until around age 7 will he describe himself in terms of generalized traits, such as popular, smart, or dumb; recognize he can have conflicting emotions; and be self-critical while holding a positive overall self-concept. It will take until later in middle childhood for Jason's self-descriptions to become more balanced and realistic ("I'm good at hockey but bad at arithmetic").

Note that when young, Jason's statements about himself are one-dimensional ("I like pizza . . . I'm really strong"). He cannot imagine having two emotions at once ("You can't be happy and scared") because he cannot consider different aspects of himself at the same time. His thinking about himself is all-or-nothing. He cannot acknowledge that his **real self**, the person he actually is, is not the same as his **ideal self**, the person he would like to be.

**Race and Self-Concept** In a classic study later used in the *Brown v. Board of Education* case arguing for the end of school segregation, Black children aged 3 to 7 years were presented with dolls of different skin colors. They were asked a series of questions about the dolls, such as which doll was the nicest and which

#### self-concept

Sense of self; descriptive and evaluative mental picture of one's abilities and traits.

#### self-definition

Cluster of characteristics used to describe oneself.

#### real self

The self one actually is.

#### ideal self

The self one would like to be.



In classic research, Black children preferred White dolls to this doll, suggesting they had internalized the negative stereotypes of the racially segregated era in which they lived.  
Jim West/Alamy Stock Photo

# research in action

## LIGHTS, CAMERA, REPRESENTATION: BIPOC CHILDREN'S EXPOSURE TO VIOLENT DIGITAL MEDIA

The pervasiveness and impact of BIPOC children's exposure to violent scenes or images may be at least partially explained by access to digital media. Specifically, the vast majority of children are exposed to digital media as early as 4 months old, and greater exposure is associated with deficits in children's ability to understand others' thoughts and feelings. Additionally, as early as 15 months old, children can learn and replicate behavior they have seen repeatedly on video (Chassiakos et al., 2016).

On average, through age 6, children watch over 10,000 acts of violence on digital media annually. Studies have shown that race and ethnicity may affect children's responses to viewing violence on digital media (Nieman, 2003; Costello & Klein, 2019). However, regardless of race, violent media can lead to desensitization to violence and the potential for behaving more violently. This is particularly important for BIPOC children, given that racial and ethnic minority groups, particularly African-Americans, are frequently portrayed as violent and overrepresented as criminals (Prot et al., 2017).

BIPOC children are also exposed to real-world police violence more often than White children.

Being exposed to police violence can cause emotional and social trauma, as well as influence children's perception of police in a negative manner. With the availability of 24-hour news coverage and ease of access to the internet and social media, children are also able to repeatedly view and discuss digital images of police violence and their aftermath. This may lead to secondary trauma and can heavily impact a child's ability to regulate their emotions and interact with others. BIPOC children exposed to police violence are more likely to be socialized to be wary of police as well due to the fact that victims of police brutality are often Black and brown individuals (Dennis, 2014).



How is modern digital media different than traditional media sources such as newspapers and television? What can parents do to mitigate the consequences of BIPOC children's exposure to violent media?

doll they would most like to play with. Although in the racially segregated era in which the children lived it was no surprise White children preferred the White dolls, much to the researchers' alarm, so did the Black children (Clark & Clark, 1965). The researchers argued the legal separation of races led to a feeling of inferiority on the part of Black children that became incorporated into their developing self-concept.

A replication showed that although children still ascribed negative characteristics to the doll with the darkest skin tone, the majority of Black children said they liked the light-skinned Black doll the best and more than the White doll (Byrd et al., 2017). It may be, given Black children have a preference for skin tones close to their own (Spencer, 2010) and given the bulk of children in the replication were biracial, that it was a preference for similarity driving the ratings rather than the incorporation of negative attributes into their self-concept. However, racism is still endemic in American society, and so too are its effects (Saleem et al., 2020). For example, meta-analyses have demonstrated the negative effects of racial discrimination and racism on health outcomes (Carter et al., 2017), academic achievement, and well-being (Benner et al., 2019). The media, too, has an influence (Research in Action).

Although the wider cultural environment is important, part of what also shapes children's growing understanding of race involves direct socialization via conversations with parents. When children are younger, these conversations focus on affirming content such as promoting cultural traditions, discussing important historical figures, eating ethnic foods, and promoting racial pride and heritage. As children become more cognitively sophisticated, the conversations include information about discrimination and preparation

for racial bias. As a whole, they help children understand where they come from and are associated with more positive attitudes about their race (Hughes et al., 2006).

**Cultural Differences in Self-Concept** Culture also helps shape the understanding of the self. For example, in highly individualistic cultures such as the United States, individuals are seen as separate from one another, and independence and self-reliance are highly valued. So, for example, European American parents tend to encourage individuality, self-expression, and self-esteem. In collectivistic cultures, such as India and China, individuals are seen as fundamentally interrelated, and group harmony and cohesiveness take precedence over individual concerns; thus, Chinese parents tend to encourage compliance with authority, appropriate conduct, humility, and a sense of belonging to the community (Oyserman et al., 2002). As another example, when reminiscing about past events with their children, European American mothers are more likely to highlight the child's internal states, a cultural message that emphasizes the personal meaning of the event and is concordant with the individualistic cultural perspective. By contrast, Chinese parents are more likely to reference the child's relationships with others, emphasizing key cultural values of connectedness and community (Wang et al., 2010).

Children absorb such differing cultural styles of self-definition as early as age 3 or 4, and these differences increase with age. When asked to describe themselves, American children are likely to focus on their individual characteristics, abstract traits, and inner qualities, and they are likely to describe themselves in positive terms. Chinese children, by contrast, describe themselves in terms of their relationships to others and the way they behave in different contexts, and their tone is likely to be neutral or negative (Wang, 2004). Moreover, children from individualistic cultures view the nature of the self as stable and unchanging. They are always themselves, regardless of context. However, children from collectivistic cultures, where social roles and interactions carry greater weight, are more likely to believe the self to be malleable. They are themselves, but the particular self displayed at any one time is based upon the social circumstances (DeMaree & Morrison, 2012).

Differences in self-definitions across cultures can even be seen in children's drawings. Children from cultures in which autonomy, individualism, and self-expression are valued tend to draw themselves larger, whereas children from cultures in which relatedness and social connections are viewed as more important draw themselves smaller (Gernhardt et al., 2014). For example, in series of studies, Cameroonian Nso farmer children drew their heads and bodies smaller than did urban German children (Rübeling et al., 2011). The Nso children were also more likely to draw their family members crowded together, in part because they drew a larger set of family members, with few signs of individual identity, and they were more likely to leave themselves out of the drawing (Gernhardt et al., 2016).

**Disability and Self-Concept** A disability is defined as any mental or physical condition making it difficult for a person to do certain activities and interact with the world around them. Some early researchers argued children with learning disabilities (Chapman, 1988) and physical disabilities (Hall & Hill, 1996) would be expected to show worse self-concept than nonaffected children.

However, research has not shown a strong link between disability and global self-concept. Rather, children with disabilities feel worse about themselves, but only in the domains in which they struggle. For example, children with cerebral palsy are likely to have a global self-concept equivalent to that of their nonaffected peers but show lower self-concept in areas such as physical appearance, athletic competence, social acceptance, and scholastic competence (Shields et al., 2006). More broadly, physical disabilities do not have a strong effect on self-esteem but do affect beliefs about physical competence and, to a lesser extent, physical appearance and social acceptance (Miyahara & Piek, 2006; Fox, 2002). Similarly, children with learning disabilities are also equivalent to nonaffected peers in global self-concept but lower within the academic domain (Bear et al., 2002).

#### disability

Any mental or physical condition making it difficult for a person to do certain activities and interact with the world around them.



Children with disabilities generally maintain a high global self-concept, although they may feel less sure of themselves in areas affected by their disability.

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## SELF-ESTEEM

### self-esteem

The judgment a person makes about their self-worth.

Are self-esteem and narcissism the same thing? Not quite. Self-esteem involves positive but realistic views of the self (realism), motivations for self-improvement (growth), and intrinsic feelings of self-worth, even when things go wrong (robustness). Narcissism involves unrealistically positive views of the self (illusion), motivations for superiority over others (superiority), and oscillations between excessive self-confidence and shame (fragility) (Brummelman & Sedikides, 2020).



**Self-esteem** is the self-evaluative part of the self-concept, the judgment children make about their overall worth. Self-esteem, in part, is based on children's growing cognitive ability to describe and define themselves.

**Developmental Changes in Self-Esteem** Before about ages 5 to 7, young children's self-esteem is not firmly based on reality, and most young children wildly overestimate their abilities. For example, despite coming in last in a race, 4-year-old Mateo might still believe himself to be the best and the fastest runner. One reason for this positive bias is that self-esteem is, in part, the result of feedback received from others, and adults tend to give positive feedback (Harter, 2006). For example, a kindergartener's crude lettering is not generally critiqued as being messy; rather, parents are more likely to praise the child's efforts. Generally, parents who are warm and loving but also ask their children to follow rules—in other words, parents who have an authoritative parenting style—are more likely to have children with higher self-esteem (Pinquart & Gerke, 2019).

Children's self-esteem also tends to be unidimensional. In other words, children believe they are either all good or all bad (Harter, 1998). Not until middle childhood does self-esteem become more realistic, as personal evaluations of competence based on internalization of parental and societal standards begin to shape and maintain self-worth (Harter, 1998). Children who feel good about themselves usually continue to feel similarly as they age. The stability of self-esteem is relatively high even in childhood and becomes increasingly so with age (Orth & Robins, 2014).

High self-esteem is generally associated with positive outcomes. For instance, low self-esteem has been linked to anxiety, depression, and attentional problems (Henriksen et al., 2017) as well as peer victimization (van Geel et al., 2018). By contrast, high self-esteem has been linked to better social relationships, mental and physical health, academic achievement and, in adulthood, employment status, marital satisfaction, education, and lowered likelihood of criminal behavior (Orth & Robins, 2014; Yang et al., 2018; Harris & Orth, 2020).

**Cultural Influences on Self-Esteem** Parents from different cultures place variable importance on their children's self-esteem. For example, European American parents report nurturing high self-esteem in their children as an important parenting goal (Harwood et al., 2001). This orientation stems from individualistic cultural values that focus on individual autonomy and achievement. By contrast, Puerto Rican, Taiwanese, Japanese, and Chinese parents do not view high self-esteem as essential for good child outcomes (Harwood et al., 2001; Miller et al., 2002; Stevenson et al., 1990). Indeed, self-esteem may even be viewed as harmful in traditional Japanese culture. Promoting individual successes is not in concert with cultural norms focused on solidifying bonds between individuals and promoting group harmony (Heine et al., 1999). Similarly, in line with Confucian ideals, modesty is viewed as a positive trait by Chinese parents, and that, rather than high self-esteem, is seen as an important goal of parenting (Luo et al., 2013).

So, how do levels of global self-esteem vary cross-culturally? Previous research has shown higher self-esteem in men than women (Zeigler-Hill & Myers, 2012). Cross-cultural research across 48 different countries confirms this findings, with the magnitude of gender differences in self-esteem increasing with age and more so in wealthier, more developed, egalitarian, and individualistic cultures (Bleidorn et al., 2016). Additionally, the research has shown that children from individualistic cultures report higher self-esteem than do those from collectivistic cultures. For example, White children evaluate themselves more positively than do Mexican-American children (Tropp & Wright, 2003). Similarly, White and Chinese children living in Britain, who were more individualistic, demonstrated more positive self-esteem than did Chinese children living in Hong Kong (Wang & Ollendick, 2001).

**Self-Esteem and Mindset** Consider the praise parents give children for succeeding. If a child is generally praised for working hard and they fail at a task, the logical implication is that they did not try hard enough. That child might then be motivated to work harder next time. If the same child is praised for being smart and they fail at a task, the implication is far different. Now the implication is that the child is no longer smart. The motivation for working hard has been stripped away.

If self-esteem is contingent on success, children may view failure or criticism as an indictment of their worth and may feel helpless to do better. Some children have a fixed mindset—a belief that their abilities are finite and that putting effort into a task shows they are bad at that task. (Dweck & Grant, 2008). For example, when given a difficult puzzle, these children are more likely to give up. They are frightened of failure because failure implies they aren't smart or capable.

Children with noncontingent self-esteem, in contrast, tend to attribute failure or disappointment to factors outside themselves or to the need to try harder. For example, when faced with the same difficult puzzle, such a child might assume the puzzle was for older children or might continue to try to put it together despite having initial difficulties. If initially unsuccessful or rejected, they persevere, trying new strategies until they find one that works (Harter, 1998; Pomerantz & Saxon, 2001). Children who believe they can succeed if they try, who enjoy challenges, and who have faith in their ability to meet those challenges tend to have parents who praise their efforts, not their inherent abilities, and who focus on specific, focused feedback rather than generic praise (Gunderson et al., 2013).

Parents from different cultures praise their children in line with desired cultural ideals; hence, there are cultural differences in mindset. These differences have been used to explain the higher academic performance of children from predominantly Asian countries. For example, Japanese and Chinese parents are more likely to focus on process, effort, and working hard than most Westerners (Shimahara, 1986; Stevenson & Stigler, 1994). The outcomes of children's attempts are also praised in accordance with cultural ideals. European American parents are more likely to praise their children's successes and to minimize their failures, whereas Chinese parents show the opposite pattern (Ng et al., 2019).

## REGULATING EMOTIONS

At 5-year-old Kayla's birthday party, Kayla opens a present from her grandmother and finds not the doll she was hoping to receive but a board game. Her face drops as her mother whispers in her ear, "Smile and tell grandma thank you. You don't want to hurt her feelings." Kayla tries, but her smile is unconvincing.

The ability to regulate, or control, one's feelings is one of the key advances of early childhood. Emotional self-regulation helps children guide their behavior and adjust their responses to meet societal expectations. Children develop the ability to regulate their emotions slowly via a shift from early reliance on orienting processes supported by the parietal and frontal areas of the brain to control of affect using frontal brain networks in the anterior cingulate gyrus (Rothbart et al., 2011).

**Cultural Influences on Emotion Regulation** Culture influences the way in which parents socialize their children's emotion regulation. Individualistic cultures such as the United States tend to value the free expression of emotions. By contrast, cultures with collectivistic and interdependent values tend to value group harmony and harmonious relationships. Parents from these cultures are more likely to encourage minimizing strong emotional expressions, especially if those emotions are negative (Fung et al., 2018). For example, parents from the United States and Germany encourage their children to express their emotions when upset and see this as a healthy expression of autonomy, whereas parents from India and Nepal tend to become distressed when their children express negative emotions (Heikamp et al., 2013).

These socialization patterns also impact how children express their emotions. For example, in one study, Chinese children expressed less disgust, smiled less, and were



Giving children generic praise—"great job!"—in response to, for example, a drawing is associated with children giving up after failure. This is because if they fail, they assume it's because they lack the overall ability to draw well. However, when praise is targeted—"great job drawing!"—children tend to persevere in the face of failure. This is because this implies their earlier success was due to their efforts related to drawing, not their abilities (Zentall & Morris, 2010).

## checkpoint can you . . .

- Trace early self-concept development?
- Discuss cultural differences in self-concept development?
- Tell how young children's self-esteem differs from older children's and explain how the helpless pattern arises?



Young children might be able to read your emotions better than you think. New research suggests that children as young as 6 can tell the difference between a real smile and a fake smile. But they're not great at it: They're only accurate about 60 percent of the time (Gosselin et al., 2009).

overall less emotionally expressive than were European American children (Camras et al., 2006). Another study found that children in the United States expressed the most pride, Japanese children the most shame, and Korean children the most guilt (Furukawa et al., 2012).

## UNDERSTANDING EMOTIONS

### **social emotions**

Emotions involved in the regulation of social behavior that require self-awareness and the understanding of others' viewpoints.

Guilt, shame, and pride are known as the social emotions because they help regulate social interactions and are involved with moral development. If you feel ashamed after getting caught doing something others think is bad, that might keep you from doing it again.



Emotional understanding appears to proceed in an ordered and hierarchical manner. Preschoolers can talk about their feelings and often those of others, and they understand that emotions are connected with experiences and desires (Saarni et al., 2006). At about 3 years of age, after children gain self-awareness and accept the standards of behavior their parents have set, they develop the **social emotions**, including guilt, shame, and pride.

By about 4 to 5 years, most children can recognize the facial expressions of joy, sadness, fear, anger, surprise, and disgust (Widen & Russell, 2008), although girls tend to outperform boys slightly (Denham et al., 2015). Preschoolers can talk about their feelings and often those of others, they understand that emotions are connected with experiences and desires, and they know reminding someone of something that happened can elicit that emotion again (Saarni et al., 2006; Pons et al., 2004). They also understand that someone who gets what they want will be happy and someone who does not get what they want will be sad (Lagattuta, 2005). Children can also recognize emotions as reflected in vocal cues (Sauter et al., 2013) and body posture, such as found in a sad person's slumped shoulders or an angry person's aggressive stance (Parker et al., 2013).

By about 7 years of age, children start to understand that mental states can drive emotions. For example, they understand that someone can feel one way and look another. They also understand that what someone believes, even if it is not true, can affect emotional state and what someone wants, even if they themselves do not want it, can also affect emotional state (Pons et al., 2004).

Last, by about 9 years of age, children start to understand more complex aspects of emotion. For example, they understand that situations can be viewed from multiple perspectives, that people might have conflicting emotions such as feeling angry at someone while loving them, and that they can use cognitive strategies to regulate their emotional state (Pons et al., 2004). This process will be discussed more fully in Chapter 14.

Emotional understanding is important. One meta-analysis of research on children's emotional understanding showed children with more advanced emotional understanding did better academically, were more accepted by their peers, and were better adjusted in school (Voltner & von Salisch, 2017). Other researchers have suggested this association is mediated by social competence. In other words, children with better emotional understanding are higher in social competence, and social competence is then responsible for the positive school and peer outcomes (Franco et al., 2017).

### **initiative versus guilt**

Erikson's third stage in psychosocial development, in which children balance the urge to pursue goals with reservations about doing so.

### checkpoint can you...

- Trace two typical developments in understanding of emotions?
- Explain the significance of Erikson's third stage of personality development?

## ERIKSON: INITIATIVE VERSUS GUILT

The need to deal with conflicting feelings about the self is at the heart of the third stage of psychosocial development identified by Erik Erikson (1950): **initiative versus guilt**. Preschool children can do—and want to do—more and more. At the same time, they are learning that some of the things they want to do meet social approval, whereas others do not.

This conflict marks a split between two parts of the personality: the part that remains a child, full of exuberance and a desire to try new things and test new powers, and the part that is becoming an adult, constantly examining the propriety of motives and actions. Children who learn how to regulate these opposing drives develop the virtue of *purpose*, the courage to envision and pursue goals without being unduly inhibited by guilt or fear of punishment (Erikson, 1982).

# Gender

**Gender identity**, awareness of one's gender and all it implies in one's society of origin, is an important aspect of the developing self-concept.

Until relatively recently, research conducted on gender investigated (and thereby promoted) a view of gender as a primarily binary construct. For instance, much of the research prior in the 1960s and 1970s focused on addressing the issue of White male bias. Although addressing this bias was and remains important, more recent work challenges the implicit and relatively simplistic model of maleness and femaleness as bipolar opposites (Zosuls et al., 2011).

Now, researchers acknowledge that any good theory of gender development should be capable of addressing not just the typical path to gender identity but also provide an explanatory framework for atypical development. The study of variations in gender identity can provide us with valuable information about how biology affects our understanding of who we are. However, because much of the earlier work framed gender as binary, much of the research still carries this bias.

## SEX DIFFERENCES

Sex differences (as traditionally investigated and defined) are psychological or behavioral differences between males and females. This is a controversial area of psychology.

Measurable differences between baby boys and girls are few. Although some sex differences become more pronounced after age 3, boys and girls on average remain more alike than different. Fully 78 percent of these differences are small to negligible, and some differences, such as in self-esteem, change with age (Hyde, 2005).

Physically, among the larger sex differences are boys' higher activity level, superior motor performance, especially after puberty, and greater propensity for physical aggression (Archer, 2004; Baillargeon et al., 2007; Pellegrini & Archer, 2005; Nielsen et al., 2011). These physical differences impact the nature of play. Boys engage in more rough-and-tumble, physically active play than girls do (LaFreniere, 2011). There are also sex-typed toy preferences; girls prefer to play with dolls and doll accessories, and boys prefer to play with construction and transportation toys (Pasterski et al., 2011). Sex-typed play preferences increase between toddlerhood and middle childhood, and the degree of sex-typed behavior exhibited early in life is a strong indicator of later gender-based behavior (Golombok et al., 2008).

Cognitive sex differences are few and small and are affected by task characteristics (Miller & Halpern, 2014; Ardila et al., 2011). While there are fine-grain differences in particular areas, there do not appear to be differences in overall intelligence (Nisbett et al., 2012).

Boys and girls do equally well on tasks involving basic mathematical skills and are equally capable of learning math but show variations in specific abilities. Most of these differences emerge in elementary school or later (Spelke, 2005). Girls tend to perform better on tests on mathematical computation and memory for lists of numbers and objects. Girls also tend to outperform boys on problems requiring algebraic solutions or short-answer responses. Boys generally show an advantage in mental rotations, especially when the task involves three-dimensional objects and when it is timed (Miller & Halpern, 2014; Lauer et al., 2019). Boys tend to do better in mathematical word problems and memory for spatial configurations (Spelke, 2005). Boys' mathematical abilities vary more than girls', with more boys at both the highest and lowest ends of the ability range (Halpern et al., 2007). However, in most studies, mathematics test performance tends to be about the same (Miller & Halpern, 2014).

Girls generally show a verbal advantage (Bornstein et al., 2004). Across different languages, they tend to start using language earlier, say more, and combine words earlier (Eriksson et al., 2012). Boys are more likely to stutter or to have a reading disability

### gender identity

Awareness, developed in early childhood, of one's gender.



*Even in the womb, male fetuses are more active than female fetuses (Eaton et al., 1986).*



*One clear behavioral difference between young boys and girls is boys' greater propensity for physical aggression.*

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## checkpoint can you... can you...

- Summarize the main behavioral and cognitive differences between boys and girls?

### gender roles

Behaviors, interests, attitudes, skills, and traits that a culture considers appropriate for each sex; differ for males and females.

### gender-typing

Socialization process by which children, at an early age, learn appropriate gender roles.

### gender stereotypes

Preconceived generalizations about male or female role behavior.

than girls (Wallentin, 2009; Rutter et al., 2004). In early childhood and again during preadolescence and adolescence, girls tend to use more responsive language, such as praise, agreement, acknowledgment, and elaboration on what someone else has said (Leaper & Smith, 2004). Girls also tend to show an advantage in school and tend to earn higher grades, especially in language classes (Voyer & Voyer, 2014).

We need to remember, of course, that sex differences are valid for large groups of boys and girls but not necessarily for individuals. By knowing a child's sex, we cannot predict whether that particular boy or girl will be faster, stronger, smarter, more talkative, or more assertive than another child.

## PERSPECTIVES ON GENDER DEVELOPMENT

**Gender roles** are the behaviors, interests, attitudes, skills, and personality traits that a culture considers appropriate for males or females. Historically, in most cultures, women have been expected to devote most of their time to caring for the household and children, whereas men were providers and protectors. Women were expected to be compliant and nurturing; men to be active, aggressive, and competitive. Today, gender roles have become more diverse and more flexible.

**Gender-typing**, the acquisition of a gender role, takes place early in childhood, but children vary greatly in the degree to which they become gender-typed (Iervolino et al., 2005). **Gender stereotypes** are preconceived generalizations about male or female behavior: "All females are passive and dependent; all males are aggressive and independent." They appear to some degree in children as young as 2 or 3, increase during the preschool years, and reach a peak at age 5 (Campbell et al., 2004).

The link between biological sex and gender—a social and psychological construct—is complex and shaped by a myriad of influences. Five theoretical perspectives—biological, evolutionary developmental, psychoanalytic, cognitive, and social learning (Table 1)—contribute to our understanding of gender.

**Biological Approach** The existence of similar gender roles in many cultures suggests that some gender differences may be biologically based. In fact, if gender differences

**TABLE 1** Five Perspectives on Gender Development

Theories	Major Theorists	Key Processes	Basic Beliefs
Biological approach		Genetic, neurological, and hormonal activity	Many behavioral differences between the sexes can be traced to biology.
Evolutionary approach	Charles Darwin	Natural and sexual selection	Child develops gender roles in preparation for adult mating and reproductive behavior.
Psychoanalytic approach	Sigmund Freud	Resolution of unconscious emotional conflict	Gender identity occurs when the child identifies with the same-sex parent.
Cognitive approach Cognitive-developmental theory	Lawrence Kohlberg	Self-categorization	Once a child learns she is a girl or he is a boy, the child sorts information about behavior by gender and acts accordingly.
Gender-schema theory	Sandra Bem, Carol Lynn Martin, Charles F. Halverson	Self-categorization based on processing of cultural information	Child organizes information about what is considered appropriate for a boy or a girl on the basis of what a particular culture dictates.
Social learning approach Social cognitive theory	Albert Bandura, Walter Mischel	Observation of models, reinforcement	Child observes and imitates gendered behavior and is reinforced for appropriate behavior and punished for inappropriate behavior.

were purely cultural inventions, we would expect to see more variability in male and female roles and characteristics across cultures.

In this view, differences we see between boys and girls are influenced by brain anatomy. These differences arise from, among others, genes coding for differences in anatomy and function between the sexes, prenatal hormonal exposure, differing environmental experiences, or the activating effects of puberty in adolescence.

Across the life span and starting early in development, men, on average, have larger brain volume than women (Rugrok et al., 2014; Polunina & Byrun, 2017). However, this difference appears to be driven by boys' and men's larger body size as brain weight increases proportionately with height (Zaidi, 2010). Although results are sometimes contradictory and depend on the age being assessed, overall, it appears that girls' brains have a higher proportion of gray matter (neurons) and a thicker cortex, and show greater cerebral blood flow, whereas boys' brains contain a higher proportion of white matter (axons for communication between neurons) and larger volume in the central subdivision of the bed nucleus stria terminalis (Kaczurkin et al., 2019; Nguyen et al., 2019).

One important influence may be what occurs in the womb, where hormones affect the developing brain (Roselli, 2018). An analysis of fetal testosterone levels and the development of gender-typical play has shown a link between higher testosterone levels and male-typical play in boys (Auyeng et al., 2009). Additionally, fetal testosterone exposure has been linked to dominance, status striving behavior, and, more weakly, aggression and violence in adults (Eisenegger et al., 2011; Turanovic et al., 2017). Some research focuses on girls with a disorder called congenital adrenal hyperplasia. These girls have high prenatal levels of androgens (male sex hormones). They tend to show preferences for boys' toys, rough play, and male playmates, as well as strong spatial skills. Estrogens (female sex hormones), on the other hand, seem to have less influence on boys' gender-typed behavior (Pasterski et al., 2011; Berenbaum et al., 2012).

*Variations in Gender Identity Development* As psychologists began to appreciate the diversity in gender development, they increasingly turned their attention to variations in gender identity development, including transgender and intersex people. **Transgender people** are individuals whose gender identity is different from their biological sex. **Intersex people** are those born with sexual or reproductive anatomical variations not typical for male or female bodies.

Perhaps the most compelling examples of biologically based research have to do with infants born with ambiguous sexual organs that are not clearly male or female. John Money and his colleagues (Money et al., 1955) recommended that these children be assigned as early as possible to the sex that holds the potential for the most nearly "normal" functioning. They based this recommendation on the appearance of the genitals. However, more recent work clearly indicates merely telling a child what they are is not enough to alter gender identity.

Although many young children play with their identity—for example, dressing up in different clothes or pretending to be something they are not—children, especially girls, who will later identify as transgender generally show strong and persistent gender dysphoria early in childhood (Steensma et al., 2013). **Gender dysphoria** is a feeling of psychological distress occurring when there is a mismatch between a person's gender identity and biological sex. It is estimated that approximately 0.3 to 0.5 percent of the global population identifies as transgender (Reisner et al., 2016). In the United States, estimates are that 1 million to 1.4 million adults identify as transgender, with a greater proportion of younger adults identifying as such (Flores et al., 2016; Meerwijk & Sevelius, 2017).

The reported number of transgender individuals has risen in the United States in recent decades, most likely as a result of increased referral rates to clinics (Zucker, 2017). However, the existence of alternate gender identities is not a new phenomenon. Greek and Roman mythology contains accounts of men turned into women, and writers of the time also spoke of men who dressed and acted as women. In the Renaissance period, there are indications that a number of notable public figures, including King

#### transgender people

Individuals whose gender identity (a social and psychological construct) is different from their sex (a biological construct).

#### intersex people

Individuals born with sexual or reproductive anatomical variations not typical for male or female bodies.

#### gender dysphoria

The feeling of psychological distress experienced by individuals when there is a mismatch between gender identity and biological sex.

*Opponents of "bathroom bills" allowing transgender people to use the bathroom of their choice argue such bills would lead to sexual voyeurism and assault. However, there has never been a verifiable instance of a male predator "pretending" to be trans in order to access women's facilities (Maza, 2014). Moreover, 1 in 2 transgender people will be sexually assaulted at some point in their lifetime (Office for Justice Programs, 2014). Trans-inclusive bathroom bills do not endanger others; they protect transgender people.*

**theory of sexual selection**  
Darwin's theory that gender roles developed in response to men's and women's differing reproductive needs.

Henry III of France and the ambassador for Louis XIV to Siam, were transgender (Denny, 1996). Anthropologists, for decades, have written about variations in gender identity and the difficulties of using a binary system to describe gender categories in other cultures, although gender identity (a person's identification as male and female) and sexual orientation (whom a person is sexually attracted to) were often conflated in the literature (Martin & Vorhees, 1975; Devereux, 1937). In the United States and Canada, anthropological accounts of indigenous peoples discussed gender-variant "two spirit" people across a variety of different native groups (Towle & Morgan, 2002). And in India, such variations have even been codified into law with hijras. Hijras have a history that spans centuries and are biologically male but adopt a feminine gender expression (Goel, 2016).

There are indications that the disparity between gender and sex in transgender people is biologically based. For example, biological women who later identify as male have markers that suggest high androgen exposure in the womb (Leinung & Wi, 2017). Additionally, research on twins suggests there may be genetic influences at play as well (Diamond, 2013). In one study, if one member of a pair of identical twins (who shared all their genes) was transgender, the other twin was also transgender 40 percent of the time. By contrast, none of the transgender fraternal twins (who shared roughly half of their genes) also had a transgender twin (Heylens et al., 2012).

There are also brain differences in transgender people, even prior to beginning gender-affirming hormone therapy. Generally, the neuroanatomy of individuals is more similar to the gender they identify with than to their biological sex. For example, their cortical thickness, grey and white matter volume and structure, structural connectivity, and the shape of the corpus callosum is more similar to their gender identity than to natal sex (Nguyen et al., 2019). In short, there is emerging evidence that gender identity—despite being a psychological construct housed in the brain—is strongly influenced by biology.

**Evolutionary Approach** The evolutionary approach sees also gendered behavior as biologically influenced. From this controversial perspective, children's gender roles underlie the evolved mating and child-rearing strategies of adult males and females.

According to Darwin's (1871) **theory of sexual selection**, the selection of sexual partners is a response to the differing reproductive pressures early men and women confronted in the struggle for survival (Wood & Eagly, 2002). In humans, females must contribute far more to raising children because of the constraints placed on them by pregnancy and nursing. Males, however, may contribute as little as a few teaspoonsfuls of semen. While a child's survival may be more certain if a man invests resources in a child, that investment is not obligatory.

This puts into play different reproductive dynamics for each sex. The more widely a man can engage in sexual activity, the greater his chances to pass on his genetic inheritance; thus, men tend to prefer more sexual partners than women do. They value physical prowess because it enables them to compete for mates and for control of resources and social status, which women value. Because a woman invests more time and energy in pregnancy and can bear only a limited number of children, each child's survival is of utmost importance to her, so she looks for a mate who will remain with her and support their offspring. More sexual activity after a pregnancy has already been achieved does not result in more children for a woman until after that child has been born and the woman is ready to carry another pregnancy. The need to raise children also explains why women tend to be more nurturing than men (Bjorklund & Pellegrini, 2000; Wood & Eagly, 2002). According to evolutionary theory, male competitiveness and aggressiveness and female nurturance develop during childhood as preparation for these adult roles (Pellegrini & Archer, 2005). Boys play at fighting; girls play at parenting.

Critics of evolutionary theory argue that society and culture are more important than biology in determining gender roles. But evolutionary theorists have never argued that culture is insignificant. Rather, they have argued that men and women have cognitive adaptations designed to be sensitive to environmental input. Moreover, they point out

that culture does not exist by itself; it is a product of our evolved minds. As such, it reflects our proclivities and who we are. We made it. Thus, to say that culture makes us who we are is a tautological argument (Tooby & Cosmides, 1992).

Moreover, evolutionary psychology is not deterministic, as some critics have argued. Research suggests that men's primary ancestral role was to provide for subsistence, whereas women's was to tend to the children, but this does not mean that we are bound to these roles. Evolution has given us an evolved architecture of the mind that pushes us in certain directions, but it has also given us the ability to reflect upon our choices and make reasoned decisions.

**Psychoanalytic Approach** "Daddy, where will you live when I grow up and marry Mommy?" asks Mario, age 4. From the psychoanalytic perspective, Mario's question is part of his acquisition of gender identity. That process, according to Freud, is one of identification, the adoption of characteristics, beliefs, attitudes, values, and behaviors of the parent of the same sex. Freud considered identification an important personality development of early childhood.

According to Freud, identification will occur for Mario when he represses or gives up the wish to possess the parent of the other sex (his mother) and identifies with the parent of the same sex (his father). A similar process was believed to occur for girls. Although this explanation for gender development has been influential, it has been difficult to test and has little research support (Maccoby, 2000). Moreover, the approach has drawn criticism for pathologizing variations in gender identity and sexual orientation (Barkai, 2017). Most developmental psychologists today favor other explanations.

**Cognitive Approach** Sarah figures out she is a girl because people call her a girl. As she continues to observe and think about her world, she concludes that she will always be a girl. She comes to understand gender by actively thinking about and constructing her own gender-typing. This is the heart of cognitive-developmental theories of gender development.

*Kohlberg's Cognitive-Developmental Theory* In Kohlberg's (1966) theory, gender knowledge ("I am a boy") precedes gendered behavior ("so I like to do boy things"). Children actively search for cues about gender in their social world. As they realize which gender they belong to, they adopt behaviors they perceive as consistent with being male or female. Thus, 3-year-old Sarah prefers dolls to trucks because she sees girls playing with dolls and therefore views playing with dolls as consistent with her being a girl (Martin & Ruble, 2004).

The acquisition of gender roles, said Kohlberg, hinges on gender constancy, a child's realization that their gender will always be the same. Once children achieve this realization, they are motivated to adopt behaviors appropriate to their gender. Gender constancy then leads to the development of gender identity, gender stability, and gender consistency (Martin et al., 2002):

- Gender identity: Awareness of one's own gender and that of others typically occurs between ages 2 and 3.
- Gender stability: Awareness that gender does not change. However, children at this stage base judgments about gender on superficial appearances (clothing or hairstyle) and stereotyped behaviors.
- Gender consistency: The realization that a girl remains a girl even if she has a short haircut and plays with trucks and a boy remains a boy even if he has long hair and earrings typically occurs between ages 3 and 7 (Martin et al., 2002).

What is the support for Kohlberg's theory? Children do start using gendered language, showing their awareness of gender identity, by about 2 years of age, although they are better at doing this for their own gender (Stennes et al., 2005; Gelman et al., 2004). The use of gender labels such as "girl" and "boy" while playing predict the later use of



This approach does not imply that men and women are consciously striving to have lots of kids and pass on their genes. Instead, it is argued that men and women do things—such as have sex—that make it more likely they will leave descendants.

#### identification

In Freudian theory, the process by which a young child adopts characteristics, beliefs, attitudes, values, and behaviors of the parent of the same sex.

#### gender constancy

Awareness that one will always be male or female; also called sex-category constancy.

gender-typed toys in young children (Zosuls et al., 2009). Additionally, gender stability does seem to be related to greater attention toward same-sex models, the adoption of more gender-stereotypical clothing, more positive feelings for one's own gender group, and a more rigid adherence to gender stereotypes (Slaby & Frey, 1975; Halim et al., 2014). These findings are in line with Kohlberg's approach.

However, Kohlberg's theory does not fare as well with respect to predictions based on gender consistency. One of the implications of his theory is that gender consistency should precede gender typing. But long before children attain the final stage of gender consistency, they show strong gender-typed preferences (Martin & Ruble, 2004). For example, gender preferences in toys and playmates appear as early as 12 months (Jadva et al., 2010), and by 24 months, toddlers seem to recognize which gender group they belong to (Stennes et al., 2005).

Nevertheless, these findings do not challenge Kohlberg's basic insight: gender concepts influence behavior (Martin et al., 2002). Today, cognitive-developmental theorists no longer claim that gender constancy must precede gender-typing. Rather, gender-typing is heightened by the more sophisticated understanding that gender constancy brings. Each stage of gender constancy increases children's attention toward and memory for gender-relevant information.

#### gender-schema theory

Theory, proposed by Bem, that children socialize themselves in their gender roles by developing a mentally organized network of information about what it means to be male or female in a particular culture.

**Gender-Schema Theory** Another cognitive approach is **gender-schema theory**. Like cognitive-developmental theory, it views children as actively extracting knowledge about gender from their environment before engaging in gender-typed behavior. However, gender-schema theory places more emphasis on the influence of culture. Once children know what sex they are, they develop a concept of what it means to be male or female in their culture. Children then match their behavior to their culture's view of what boys and girls are "supposed" to be and do (Bem, 1993; Martin et al., 2002).

Bem suggests that children who show stereotypical behavior may do so as a result of pressure for gender conformity. However, there is little evidence that gender schemas are at the root of stereotyped behavior or that children who are highly gender-typed feel much pressure to conform (Yunger et al., 2004).

Another problem with both gender-schema theory and Kohlberg's theory is that gender-stereotyping does not always become stronger with increased gender knowledge (Bandura & Bussey, 2004; Banse et al., 2010). In fact, gender-stereotyping rises and then falls in a developmental pattern. Around ages 4 to 6, when, according to gender-schema theory, children are constructing and consolidating their gender schemas, they tend to notice and remember only information consistent with these schemas. Indeed, they tend to misremember information that challenges gender stereotypes, such as photos of a girl sawing wood or a boy cooking. They are also quick to accept gender labels; when told that an unfamiliar toy is for the other sex, they will quickly discard it (Martin & Ruble, 2004). By ages 5 and 6, children develop rigid stereotypes about gender that they apply to themselves and others. Girls and boys also prefer to dress in stereotypically gender-typed ways—girls in pink dresses, boys in cowboy hats—and this tendency occurs regardless of the parents' own desires about how their children dress (Halim et al., 2014). A boy will pay more attention to what he considers boys' toys and a girl to girls' toys, and both will look to others when they encounter novel toys to determine if the toy is one that is intended for their gender group (Weisgram et al., 2014; Shutts et al., 2010). Around age 7 or 8, schemas become more complex as children take in and integrate contradictory information, such as the fact that many girls have short hair. At this point, as children develop more complex beliefs about gender, they become more flexible in their views (Martin & Ruble, 2004; Trautner et al., 2005).

Cognitive approaches to gender development have been an important contribution. However, these approaches may not fully explain the link between knowledge and conduct. There is disagreement about precisely what mechanism prompts children to act out gender roles and why some children become more strongly gender-typed than others (Bussey & Bandura, 1992; 1999; Martin & Ruble, 2004).

*Cultures with gendered languages (where nouns, verbs, and pronouns are assigned male or female status) have more gender prejudice (DeFranza et al., 2020). Why do you think this might be? Which approach to gender development best explains this finding?*

**Social Learning Approach** According to Walter Mischel (1966), a traditional social learning theorist, children acquire gender roles by imitating models and being rewarded for gender-appropriate behavior. Behavioral feedback, together with direct teaching by parents and other adults, reinforces gender-typing. A boy who models his behavior after his father is commended for acting “like a boy.” A girl gets compliments on a pretty dress or hairstyle. In this model, gendered behavior precedes gender knowledge (“I am rewarded for doing boy things, so I must be a boy”).

Since the 1970s, however, studies have cast doubt on the power of same-sex modeling alone to account for gender differences. As cognitive explanations have come to the fore, traditional social learning theory has lost favor (Martin et al., 2002). Albert Bandura's (1986) **social cognitive theory**, an expansion of social learning theory, incorporates some cognitive elements in an attempt to address these issues.

According to social cognitive theory, observation enables children to learn much about gender-typed behaviors before performing them. They can mentally combine observations of multiple models and generate their own behavioral variations. Instead of viewing the environment as a given, social cognitive theory recognizes that children select or even create their environments through their choice of playmates and activities. However, critics say that social cognitive theory does not explain how children differentiate between boys and girls before they have a concept of gender nor what initially motivates children to acquire gender knowledge (Martin et al., 2002).

For social cognitive theorists, socialization—the way a child interprets and internalizes experiences with parents, teachers, peers, and cultural institutions—plays a central part in gender development. Socialization begins in infancy, long before a conscious understanding of gender begins to form. Gradually, as children begin to regulate their activities, standards of behavior become internalized. A child no longer needs praise, rebukes, or a model's presence to act in socially appropriate ways. Children feel good about themselves when they live up to their internal standards and feel bad when they do not. In the following sections, we address three primary sources of social influences on gender development: family, peer, and cultural.

*Family Influences* Usually, experiences in the family reinforce gender-typical preferences and attitudes. It can be difficult to determine this, however, because it is difficult to separate parents' genetic influence from the influence of the environment they create. Also, parents may be responding to rather than encouraging children's gender-typed behavior (Iervolino et al., 2005).

Parents with more traditional gender-role beliefs tend to react more negatively to children playing with cross-gender-typed toys (Kollmayer et al., 2018). Boys tend to be more strongly gender-socialized concerning play preferences than girls. Parents, especially fathers, generally show more discomfort if a boy plays with a doll than if a girl plays with a truck (Ruble et al., 2006; Sandnabba & Ahlberg, 1999). Girls have more freedom than boys in their clothes, games, and choice of playmates (Fagot et al., 2000).

Parents who adhere to traditional gender schemas are more likely to have strongly gender-typed children (Tenenbaum & Leaper, 2002), and the converse is also true. Children from families with lesbian and gay parents tend to show less gender-typed play behavior (Goldberg et al., 2012), and this is especially true for girls and for children raised in families with lesbian parents (Goldberg & Garcia, 2016). There are indications that the father's role in gender socialization is especially important and that viewing fathers engaged in household tasks is associated with decreased gender-typing (Dawson et al., 2016). In general, parents' behaviors are better predictors of children's gender role attitudes than are parents' beliefs (Halpern & Perry-Jenkins, 2016).

Siblings also influence gender development. Secondborns tend to become more like their older siblings in attitudes, personality, and leisure activities, whereas firstborns are more influenced by their parents and less by their younger siblings (McHale et al., 2001). Young children with an older sibling of the same sex tend to be more gender-typed than those whose older sibling is of the other sex (Iervolino et al., 2005; McPhee & Prendergast, 2019).

#### **social cognitive theory**

Albert Bandura's expansion of social learning theory; holds that children learn gender roles through socialization.



This explanation of gender development focuses on the learning approaches. Theories help us understand and make sense of the world, and in this case, we use the principles of reinforcement and punishment to explain gender. Note that theories change in response to new data. When research began to indicate that cognition also mattered, the original approach was expanded to accommodate those findings.



Did you know that pink used to be considered masculine and blue feminine? Blue was considered soothing and so more appropriate for girls. Pink was a variation of red, a strong and active color, and was seen as more appropriate for boys.

***Peer Influences*** Even in early childhood, the peer group is a major influence on gender-typing. Preschoolers generally play in sex-segregated groups that reinforce gender-typed behavior (Martin et al., 2013), and the influence of the peer group increases with age (Martin et al., 2002). Children who play in same-sex groups (Maccoby, 2002; Martin & Fabes, 2001) or by themselves (Goble et al., 2012) tend to be more gender-typed than children who do not. Additionally, the more children choose to play with particular friends, the more they mutually influence each other (Martin et al., 2013).

Children exert pressure on each other for gender-appropriate behavior (Leaper 2015). For example, children will sometimes reprimand each other for playing with the “wrong” toys for their gender (Mayeza, 2018). Boys generally feel more pressure to behave in gender-typical ways (Ruble et al., 2006), although girls generally show more in-group favoritism, assigning more positive qualities to their own gender than to boys (Carver et al., 2003). Those children who are content with their gender tend to have more positive outcomes than those who are not. They tend to have higher self-esteem and social competence, higher-quality attachments to others, and fewer internalizing problems such as anxiety and depression, and are less often victimized by peers (Perry et al., 2019).

Being gender atypical, especially when behaviors trigger negative sanctions from peers, is associated with negative outcomes, including delinquency, weight loss behaviors, depression, and suicidal ideation (Weber et al., 2019). It is associated with peer victimization (Zosuls et al., 2016), although the relationship is not always simple. For example, in one study, peer harassment was associated with a decrease in gender atypicality for children with many male friends. However, it was also associated with an increase in gender atypicality for children with many female friends (Lee & Troop-Gordon, 2011). This illustrates the interactive influence of peer processes and self-socialization. While peers can be a negative influence, friends can also serve as a protective buffer against victimization (Zosuls et al., 2016),

***Cultural Influences*** When a young girl in Nepal touched the plow that her brother was using, she was scolded. In this way, she learned that as a girl, she must refrain from acts her brother was expected to perform (Skinner, 1989). Social learning theory predicts that the cultural influences around us will influence the degree to which we become gender-typed. For example, even brief exposure to photographs of children playing with counter-stereotypical toys leads children to express more gender-flexible attitudes toward the play of other children, while exposure to photos of children playing with gender-stereotypical toys, for boys, leads to their greater endorsement of gender-based exclusion (Spinner et al., 2018). Over time, repeated exposure to gendered information such as this exerts a powerful effect on children.

Children’s books have long been a source of gender stereotypes. Analyses of top-selling and award-winning children’s books have uncovered nearly twice as many male as female main characters, greater representation of males in book titles, and strong gender-stereotyping (McCabe et al., 2011). Female main characters nurtured more, were portrayed in indoor settings, and appeared to have no paid occupations (Hamilton et al., 2006). Fathers were largely absent, and when they appeared, they were shown as withdrawn and ineffectual (Anderson & Hamilton, 2005). Similar results have been found in coloring books, where females are more typically portrayed as children and males as superheroes, animals, or adults (Fitzpatrick & McPearson, 2010). Even children’s schoolbooks are not immune; research across multiple cultures, including the United States, Malaysia, Indonesia, Pakistan, Bangladesh, Australia, Singapore, Turkey, and Romania, shows the presentation of men and women in children’s textbooks is often sexist, with men overrepresented and both men and women portrayed in stereotypical occupations and engaging in stereotypical behaviors (Deckman et al., 2018; Islam & Asadullah, 2018; Incikabi & Ulusoy, 2019; Concordă, 2018).

In the United States, television is a major format for the transmission of cultural attitudes toward gender (Collins, 2011). This includes television programming as well as commercials (Eisend, 2010) and music videos (Wallis, 2011). In both children’s and prime-time programming, boys and men are overrepresented and receive greater screen

time. Moreover, in children's programming, boys display a wider range of emotions than girls do; in adult programming, men are portrayed as dominant, and women are likely to be portrayed as sexually provocative (Martin, 2017; Sink & Mastro, 2017). Not surprisingly, children who watch more television become more strongly gender-typed (Kimball, 1986).

Movies also have an impact. Research has shown that males in G-rated movies are more likely to be main characters, and females are more likely to be portrayed as young and as possessing traits such as intelligence and beauty (Smith et al., 2010). Even the posters used to market movies are stereotypically gendered, with males more often displayed as the main characters and more powerful than females (Aley & Hahn, 2020).

Disney movies, in part because of their popularity, have been frequent targets of criticism because of their stereotypical portrayal of male and female roles. While Disney has made attempts at introducing more egalitarian ideals in its line of princess movies (England et al., 2011), more work remains. One recent study showed that preschool girls who were highly engaged with Disney princess movies showed higher gender-stereotypical behavior a year later than did children less engaged with princess movies (Coyne et al., 2016).

Major strengths of the socialization approach include the breadth and multiplicity of processes it examines and the scope for individual differences it reveals. But this very complexity makes it difficult to establish clear causal connections between the way children are raised and the way they think and act. Further research may help us see how socializing agents mesh with children's biological tendencies and cognitive understandings with regard to gender-related attitudes and behaviors.

## Play

Carmen, age 3, pretends that the pieces of cereal floating in her bowl are "fishies" swimming in the milk. After breakfast, she puts on her mother's hat, picks up a briefcase, and is a "mommy" going to work. She rides her tricycle through the puddles, comes in for an imaginary phone call, turns a wooden block into a truck and says, "Vroom, vroom!"

Play is ubiquitous, not just in young humans—who take almost any opportunity they can to play—but also in the young of many species, especially intelligent ones (Bjorklund & Pellegrini, 2000; Graham & Burghardt, 2010). Play is important to healthy development of body and brain. It enables children to engage with the world around them, to use their imagination, to discover flexible ways to use objects and solve problems, and to prepare for adult roles. Play is not what children do to burn off energy so they can get to the real business of learning. Play is the context in which much of the most important learning occurs. Indeed, play is so important to children's development that the United Nations High Commissioner for Human Rights (1989) has recognized it as a right of every child.

In humans, early locomotor play is believed to support gross motor skill and neuromuscular development (Burdette & Whitaker, 2005). Exercise play increases from early childhood to the early primary school years, and vigorous activity may help develop muscle strength, endurance, efficiency of movement, and athletic coordination (Graham & Burghardt, 2010; Smith & Pellegrini, 2013).

The most complex and difficult thing we will ever have to learn how to navigate is our social world, and social play helps us practice how to do this. Across cultures, social play allows children the opportunity to develop and sustain friendships, practice cooperation, negotiate conflict, and build complex social skills in coordination with peers (Jarvis et al., 2014; Kamp, 2001). Pretend play has been linked to cognitive functions, such as creativity, flexible thinking, perspective taking, and exploring the bounds of fantasy and reality (Russ & Wallace, 2013). Play fighting, which is often discouraged by adults, has adaptive functions as children innovate story lines, practice controlled physical movements, and experiment with themes of competition and aggression (Hart & Tannock, 2013).

### checkpoint can you . . .

- Compare five approaches to the study of gender development?
- Assess evidence for biological explanations of gender differences?
- Discuss how various theories explain the acquisition of gender roles, and assess the support for each theory?



Toys are nothing new. Dolls with elaborate hair styles have been found in Egyptian tombs, and Roman boys had action figures—terracotta gladiators with articulated arms (Lancy, 2008).

Researchers categorize children's play in varying ways. One common classification system is by cognitive complexity. Another classification is based on the social dimension of play. Research has also uncovered gender and cultural influences on play.

## COGNITIVE LEVELS OF PLAY

Jane, at 1, happily banged a spoon on a pot while sitting on the kitchen floor. Courtney, at 3, talked for a doll, using a deeper voice than her own. Miguel, at 4, wore a kitchen towel as a cape and "flew" around as Batman. These children were engaged in various types of play and, as is typical, showed increasing cognitive complexity with age.

Smilansky (1968) identified four levels of play: functional play, constructive play, dramatic play, and formal games with rules. Although there is a general developmental progression to the types of play, this is not a stage theory.

The simplest level, which begins during infancy, is **functional play** (sometimes called locomotor play), consisting of repeated practice in large muscular movements, such as rolling a ball (Bjorklund & Pellegrini, 2002).

The second level, **constructive play** (also called object play), is the use of objects or materials to make something, such as a house of blocks or a crayon drawing (Bjorklund & Pellegrini, 2002).

The third level, **dramatic play** (also called pretend play, fantasy play, or imaginative play), involves imaginary objects, actions, or roles. More advanced cognitive development affords more sophisticated play, but play also helps strengthen the development of dense connections in the brain and promotes later capacity for abstract thought. Play is not just the response to a developing intellect; it is the driver of it as well. For example,

studies have found the quality of dramatic play to be associated with social and linguistic competence (Bergen, 2002). Pretend play also may further the development of theory-of-mind skills (Smith, 2005). Pretending that a banana is a telephone, for example, and understanding that you and I both agree on that pretense can help children begin to understand others' thoughts.

Dramatic play peaks during the preschool years (Bjorklund & Pellegrini, 2002; Smith, 2005) and then declines as school-age children become more involved in **formal games with rules**—organized games with known procedures and penalties, such as four square and freeze tag. However, many children continue to engage in pretending well beyond the elementary school years.

## THE SOCIAL DIMENSION OF PLAY

In a classic study, Mildred B. Parten (1932) identified six types of play (Table 2). She found that as children get older, their play tends to become more social; that is, more interactive and more cooperative. Although this general progression is common, children of all ages also engage in all of Parten's categories of play (Rubin et al., 1998).

Parten incorrectly regarded nonsocial play as less mature than social play. She suggested that young children who continue to play alone could develop social, psychological, or educational problems. It is true that solitary play can be a sign of shyness, anxiety, fearfulness, or social rejection (Rubin et al., 2018). However, researchers now consider not only whether a child plays alone but why. Some children may just prefer to play alone (Coplan et al., 2015). A preference for solitude is not necessarily associated with negative outcomes in adulthood, so it is reasonable to think the same might be true for children (Ooi et al., 2018). In fact, most children who like to play alone are rated as socially and cognitively competent by others (Harrist et al., 1997). Similarly, reticent play, a combination of Parten's unoccupied and onlooker categories, is

### functional play

Play involving repetitive large muscular movements.

### constructive play

Play involving use of objects or materials to make something.

### dramatic play

Play involving imaginary people or situations; also called *pretend play*, *fantasy play*, or *imaginative play*.

### formal games with rules

Organized games with known procedures and penalties.



This young "butterfly" is participating in dramatic play based on the ability to use symbols to stand for people or things.

Sean Justice/Fuse/Corbis/Getty Images

**TABLE 2** Parten's Categories of Social and Nonsocial Play

Category	Description
<b>Unoccupied behavior</b>	The child does not seem to be playing but watches anything of momentary interest.
<b>Onlooker behavior</b>	The child spends most of the time watching other children play. The onlooker may talk to them but does not enter into the play. .
<b>Solitary independent play</b>	The child plays alone with toys that are different from those used by nearby children and makes no effort to get close to the other children.
<b>Parallel play</b>	The child plays independently beside rather than with the other children, playing with similar toys, and does not try to influence the other children's play.
<b>Associative play</b>	The child plays with other children. All the children play similarly, but there is no organization around a goal. Each child is interested more in being with the other children than in the activity itself.
<b>Cooperative or organized supplementary play</b>	The child plays in a group organized for some goal—to make something, play a formal game, or dramatize a situation. By a division of labor, children take on different roles.

Source: Adapted from Parten (1932, pp. 249–251).

often a manifestation of shyness (Coplan et al., 2004) but does not seem to affect whether or not children are well-liked or have problem behaviors (Spinrad et al., 2004). Nonsocial play, then, seems to be far more complex than Parten imagined.

One kind of play that becomes increasingly social during the preschool years is dramatic play (Rubin et al., 1998). Children typically engage in more dramatic play when playing with someone else than when playing alone (Bjorklund & Pellegrini, 2002). In pretending together, children develop joint problem-solving, planning, and goal-seeking skills; gain understanding of other people's perspectives; and construct an image of the social world (Bergen, 2002; Bjorklund & Pellegrini, 2002; Smith, 2005).

A common type of dramatic play involves imaginary companions. This normal phenomenon of childhood is seen most often in firstborn and only children, who lack the close company of siblings, and more often in girls. (Carlson & Taylor, 2005). Children who have imaginary companions are perfectly capable of distinguishing fantasy from reality (Taylor et al., 1993). They play more imaginatively and cooperatively than other children (Singer & Singer, 1990), they do not lack for friends (Gleason et al., 2000), and they perform better on theory-of-mind tasks (such as differentiating appearance and reality and recognizing false beliefs) and tasks of emotional understanding (Giménez-Dasi et al., 2016). Teachers rate children with imaginary companions as higher in social competence (Gleason & Kalpidou, 2014), and although 5½-year-olds with imaginary companions do not have a bigger vocabulary than children without imaginary companions, they engage in more private speech (Davis et al., 2013), and they tell more elaborate stories about both personal experiences and a storybook (Trionfi & Reese, 2009). Moreover, when children are encouraged to engage in fantastical play, such as pretending to take a trip to the moon to interact with space creatures, having an imaginary companion is associated with improvements in their working memory and attentional control tasks (Thibodeau et al., 2016). These types of results, as a whole, point to the role of play and imagination in the development of essential cognitive and socio-emotional skills.



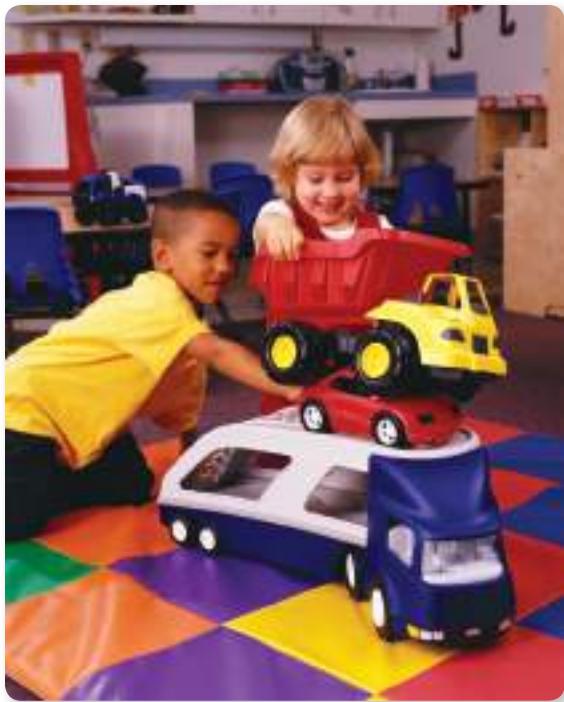
How do you think the growing use of computers for both games and educational activities might affect preschool children's play?

## GENDER AND PLAY

As mentioned previously, girls tend to select other girls as playmates, and boys prefer other boys, a phenomenon known as **gender segregation**. Gender segregation is common among preschoolers and becomes more prevalent in middle childhood. This tendency seems to be universal across all cultures (Smith, 2005), including in hunter-gatherer children (Lew-Levy et al., 2018). Boys' tendency to be more active and physically aggressive in their play as compared to girls' more nurturing play styles are major contributors

### gender segregation

Tendency to select playmates of one's own gender.



Preschool girls and boys do not typically play together. When they do, they usually play with "masculine" toys such as cars, trains, or blocks.

Gaetano/The Image Bank/Getty Images

Wild female chimpanzees play with sticks as if they were dolls: holding and cuddling them, and even putting them to bed in a "nest." Male chimpanzees, by contrast, are less likely to do so (Kahlenberg & Wrangham, 2010).



(Martin et al., 2011). Generally, boys' play is more strongly gender-stereotyped than girls' (Bjorklund & Pellegrini, 2002). Thus, when boys and girls do play together, their play tends to revolve around traditionally masculine activities (Goble et al., 2012).

Regardless of the cultural group they come from, boys tend to engage in more exploratory and rough-and-tumble play, and girls enjoy more symbolic and pretend play, as well as more structured, adult-supervised activities (Cote & Bornstein, 2009; Fabes et al., 2003). Girls' pretend stories generally focus on social relationships and nurturing, domestic roles, as in playing house (Pellegrini & Archer, 2005). Boys' pretend play often involves danger or discord and competitive, dominant roles, as in mock battles, and their play is more strongly gender-stereotyped than girls' (Bjorklund & Pellegrini, 2002). In mixed-sex groups, play tends to revolve around traditionally masculine activities (Fabes et al., 2003). The more salient gender is made (for example, with the use of different clothing for men and women or when children are separated into groups by gender), the more children believe in gender stereotypes and the less they play with other-sex peers (Hilliard & Liben, 2010).

There are also sex-typed toy preferences; girls prefer to play with dolls and doll accessories, and boys prefer to play with construction and transportation toys (Pasterski et al., 2011). Sex-typed toy preferences also exist in hunter-gatherer and agrarian populations, and tend to mirror activities children will need to become proficient in as adults. For example, boys in West Africa are adept at tree-climbing, a skill they will use in adulthood to harvest palm nuts (Lancey, 1996). Similarly, girls in Southern Africa play at grain processing, imitating the adult women they see around them pounding grain with a mortar and pestle. Boys, by contrast, practice hunting skills (Bock & Johnson, 2004).

Sex-typed play preferences increase between toddlerhood and middle childhood, and the degree of sex-typed behavior exhibited early in life is a strong indicator of later gender-based behavior (Golombok et al., 2008). Children raised in gay and lesbian families, where beliefs about gender are more flexible (Goldberg, 2007), are less stereotyped in their play (Goldberg et al., 2012). Social influences can minimize or maximize existing differences, but they do not seem to create them.

## CULTURE AND PLAY

Cultural values influence beliefs about the importance of play. In Western cultures such as the United States, some argue that adequate amounts of child-directed free play are necessary for optimal development. In other cultures, play may be viewed differently. For example, in one study, parents from China, Korea, Pakistan, Nepal, and India were asked about their beliefs and reported they saw little developmental value in play, preferring to encourage academics. The European parents in the same study, by contrast, believed that play was important for development (Parmar et al., 2004). Similarly, teachers in Sweden and the United States in another study saw play as "children's work," although Japanese educators did not (Izumi-Taylor et al., 2010).

The degree of egalitarianism of a country does not seem to affect children's toy preferences, although a comparison of more recent studies to older studies suggests gendered toy preferences have declined, especially for girls, in recent decades (Todd et al., 2018). However, cultural values affect the play environments adults set up for children, and these environments in turn affect the frequency of specific forms of play across cultures (Bodrova & Leong, 2005). Moreover, cultural values also affect the opportunities children are given to play. For instance, schools in industrialized nations have increasingly shortened or eliminated recess (American Academy of Pediatrics, 2013), reflecting the greater value placed on academics over free play.

Culture also influences the nature of play via peer interactions. Children who behave in ways that are contrary to cultural values may be met with rejection from peers, while those who embody those values are likely to be accepted (Chen, 2012). As one example, Western-style cultures are more likely to value independence and initiative; collectivistic cultures place a higher value on traits such as self-control and group harmony (Chen, 2012; Rogoff, 2003). One observational study compared middle-class Korean American and Anglo American children in separate preschools. The Korean American children played more cooperatively, often offering toys to other children—very likely a reflection of their culture's emphasis on group harmony. Anglo American children were more aggressive and often responded negatively to other children's suggestions, reflecting the competitiveness of American culture (Farver et al., 1995). Even the games themselves can be designed to reflect important cultural values. For instance, in the collectivistic *Tangu* of Papau New Guinea, a popular game called *taketak* always ends in a tie (Burridge, 1957). Similarly, the Aka foragers of the Congo play *ndanga*, a game in which no scores are kept and there is no winner (Boyette, 2013).

## Parenting

Parenting can be a complex challenge. Parents must deal with small people who have independent minds and wills but who still have a lot to learn about what kinds of behavior work well in society.

### FORMS OF DISCIPLINE

In the field of human development, **discipline** refers to methods of molding character and of teaching self-control and acceptable behavior. In casual speech, we tend to think of discipline as involving only punishment, but the psychological definition of the word also includes techniques such as rewarding desired behaviors and drawing attention to how actions affect others.

**Reinforcement and Punishment** “You’re such a wonderful helper, Nick! Thank you so much for putting away your toys.” Nick’s mother smiles warmly at her son as he plops his dump truck into the toy box.

Parents sometimes punish children to stop undesirable behavior, but children usually learn more from being reinforced for good behavior. External reinforcements may be tangible (treats, more playtime) or intangible (a smile, a word of praise, or a special privilege). Whatever the reinforcement, the child must see it as rewarding and must receive it fairly consistently after showing the desired behavior. Eventually, the behavior should provide an internal reinforcement: a sense of pleasure or accomplishment.

There are occasions, however, when punishment, such as isolation or denial of privileges, is necessary. Children cannot be permitted to run out into traffic or hit another child. In such situations, punishment, if consistent, immediate, and clearly tied to the offense, may be effective. It should be administered calmly, in private, and aimed at eliciting compliance, not guilt. It is most effective when accompanied by a short, simple explanation (AAP Committee on Psychosocial Aspects of Child and Family Health, 1998; Baumrind, 1996). It is important to remember that, in addition to punishment for undesired behaviors, the desired behaviors should be made clear. Children need to know what should be substituted for misbehavior.

Punishment that is too harsh can be harmful. Children who are punished harshly and frequently may have trouble interpreting other people’s actions and words and may attribute hostile intentions where none exists (Weiss et al., 1992). Young children who have been punished harshly also show more externalizing behaviors such as physical aggression and impulsivity (Erath et al., 2009). The link between harsh parenting and aggression is cross-cultural and has been found in research investigating mother-child dyads from China, India, Italy, Kenya, the Philippines, and Thailand (Gershoff et al.,

#### discipline

Methods of molding children's character and of teaching them to exercise self-control and engage in acceptable behavior.



A secure attachment with parents or a teacher in early childhood has been related to whether or not children view God as a "loving friend"—someone who is nice, loves you, and makes you happy (de Roos, 2006). If you are religious, do you think your relationship with your parents affects your religious beliefs?



Kids who come from homes in which there is domestic abuse, whether physical or emotional, are more likely to be spanked (Taylor et al., 2010).

Dante Cicchetti (2000) from the University of Minnesota has found that children from abusive homes are more likely to respond to a schoolmate's cries with aggression or withdrawal than are children from loving homes, who are more likely to try to comfort their schoolmate or go get a teacher. Why might abused children have developed this tendency? How might their parents' responses to their distress have shaped this?



#### corporal punishment

Use of physical force with the intention of causing pain, but not injury, so as to correct or control behavior.

2010). Harsh parenting has also been linked to relational aggression, in which attempts are made to damage another's social status or reputation (Kawabata et al., 2011).

The influence of harsh parenting is bidirectional; difficult children elicit more coercive parenting on the part of their parents (Pettit & Arsiwalla, 2008). Moreover, different children respond differently to harsh parenting. For example, children with attentional issues are particularly likely to respond to coercive parenting with behavior problems (Scott et al., 2012), exacerbating the original problem, and potentially initiating a cascade of increasingly negative interactions between parent and child. By contrast, shyer children may become frightened if parents lose control and may eventually try to avoid a punitive parent, undermining the parent's ability to influence behavior (Grusec & Goodnow, 1994). Essentially, the effectiveness and influence of parenting tactics vary with child temperament (Kochanska, 1993).

**Corporal Punishment** One of the harshest forms of parenting involves the use of **corporal punishment**. Corporal punishment has been defined as “the use of physical force with the intention of causing a child to experience pain, but not injury, for the purpose of correction or control of the child’s behavior” (Straus, 1994, p. 4). It can include spanking, hitting, slapping, pinching, shaking, and other physical acts.

The rates of corporal punishment for American preschoolers trended down by 18 percent from 1975 to 2002, although the majority of parents of preschool children—almost 80 percent—still reported spanking or slapping their children (Zolotor et al., 2011). In 2015, 4 percent of parents reported spanking their children “often,” and almost 17 percent of parents reported spanking their children at least some of the time (Parker et al., 2015). Spanking is popularly believed to be more effective than other methods to instill respect for parental authority and to be harmless if done in moderation by loving parents (Kazdin & Benjet, 2003; McLoyd & Smith, 2002).

A large body of evidence suggests that corporal punishment is often counterproductive and should be avoided (Gershoff et al., 2018). Apart from the risk of injury, children who experience corporal punishment may fail to internalize moral messages, develop poor parent-child relationships, and show increased physical aggressiveness or antisocial behavior. As adults, they are more likely to suffer from mental health issues, engage in criminal behavior, and abuse their own children (Gershoff, 2013). A link between spanking and externalizing behaviors has been found in children from different cultural and ethnic groups, both internationally, as well as within White, African American, Latino, and Asian American families in the United States (Gershoff et al., 2010; Gershoff et al., 2012; Berlin et al., 2009). In addition, spanking has been negatively associated with cognitive development (MacKenzie et al., 2013; Berlin et al., 2009), and there is no clear line between mild and harsh spanking; mild spanking often leads to the other (Kazdzis & Benjet, 2003).

Corporal punishment is common across many cultures and found at all income levels (Runyan et al., 2010). Estimates are that approximately 90 percent of children live in countries where corporal punishment of children is legal (Human Rights Watch, 2014). Approximately 75 percent of parents use corporal punishment at least occasionally (Ripoll-Núñez & Rohner, 2006), and the use of corporal punishment in schools is prevalent across the globe (Heekes et al., 2020). Physical punishment of children is more common in cultures that endorse the use of physical violence at a societal level and in which levels of violence are high, where there is warfare, when gun ownership is common, and where there is high support for the death penalty (Lansford & Dodge, 2008; Xu et al., 2000). It is also more common in families of lower socioeconomic level and education and in those with conservative religious belief systems (Parker & Horowitz, 2015; Ellison & Bradshaw, 2009).

Some researchers have argued corporal punishment needs to be evaluated within the context of different cultural belief systems (Renteln, 2010). However, the bulk of research has found a relationship between spanking and externalizing behaviors in children from different cultural and ethnic groups, both internationally as well as within White, African American, Latino, and Asian American families in the United States (Gershoff et al.,

2012; Berlin et al., 2009). For example, a link between harsh parenting and aggression has been documented in research investigating mother-child dyads from China, India, Italy, Kenya, the Philippines, and Thailand (Gershoff et al., 2010). Thus, some professionals have argued that corporal punishment should be considered as verging on child abuse, regardless of the cultural context in which it appears (Straus, 2010).

In the United States, 15 states specifically allow the use of corporal punishment in schools, 7 states do not prohibit it, and 28 states specifically prohibit it (US Department of Education, 2017). However, its prevalence varies widely by location. In some states, it is nearly absent. In other states, it is relatively common. For instance, in Mississippi, 1 in every 14 children can expect to experience an incident of corporal punishment within an academic year (Gershoff & Font, 2016). Some educators believe it is an effective deterrent to harmful misbehaviors, such as fighting, but others assert that corporal punishment degrades the educational environment. Moreover, critics point to the fact that ethnic minority children and children with disabilities are subject to corporal punishment more frequently (US Department of Education, 2017).

**Other Disciplinary Techniques** When Sara took candy from a store, her father did not lecture her on honesty, spank her, or tell her what a bad girl she had been. Instead, he explained how the owner of the store would be harmed by her failure to pay for the candy and how sad he would feel that it was gone. He asked Sara how she would feel in the same situation. Then he took her back to the store to return the candy. Although he did not ask her to do so, Sara told the store owner she was sorry she had made him sad.

**Inductive techniques**, such as those Sara's father used, are designed to encourage desirable behavior or discourage undesirable behavior by setting limits, demonstrating logical consequences of an action, explaining, discussing, negotiating, and getting ideas from the child about what is fair. They also tend to include appeals to consider how one's actions affect how others feel.

Inductive techniques are usually the most effective method of getting children to accept parental standards (Hoskins, 2014). Inductive reasoning tends to arouse empathy for the victim of wrongdoing as well as guilt on the part of the wrongdoer (Kochanska et al., 2002). Parents who use inductive techniques are more likely to have children who see the moral wrongness of behavior that hurts other people (Grusec, 2006; Volling et al., 2009).

Two other broad categories of discipline are power assertion and temporary withdrawal of love. **Power assertion** is intended to stop or discourage undesirable behavior through physical or verbal enforcement of parental control; it includes demands, threats, withdrawal of privileges, spanking, and other types of punishment. **Withdrawal of love** may include ignoring, isolating, or showing dislike for a child. Neither of these is as effective as inductive reasoning in most circumstances, and both may be harmful (Baumrind et al., 2010).

How well children accept a disciplinary method may depend on whether the type of discipline used is accepted in the family's culture. For example, research with Western samples shows that psychological control tactics, such as love withdrawal or shaming, are generally associated with negative outcomes in European American children (Scharf & Goldner, 2018). However, these techniques can be effective in other contexts. For example, Chinese and Russian parents are more likely than American parents to use psychological control tactics. However, although American preschool children whose parents use psychological control tactics show an increase in internalizing and externalizing behaviors, Chinese children show no such pattern, and in Russian children, psychological control is linked only to externalizing problems (Olsen et al., 2002).

One point on which many experts agree is that a child interprets and responds to discipline in the context of an ongoing relationship with the parents. Some researchers, therefore, look beyond specific parental practices to overall styles, or patterns, of parenting.

#### inductive techniques

Disciplinary techniques designed to induce desirable behavior by appealing to a child's sense of reason and fairness.

#### power assertion

Disciplinary strategy designed to discourage undesirable behavior through physical or verbal enforcement of parental control.

#### withdrawal of love

Disciplinary strategy that involves ignoring, isolating, or showing dislike for a child.

### checkpoint can you . . .

- Compare forms of discipline and discuss their effectiveness?

As a parent, what form of discipline would you favor if your 3-year-old took a cookie from the cookie jar? Refused to nap? Hit his little sister? Tell why.



## PARENTING STYLES

Just as children differ in their temperament, parents differ in their approach to parenting.

**Baumrind's Model of Parenting Styles** In pioneering research, Diana Baumrind (1971) studied 103 preschool children from 95 families. Through interviews, testing, and home studies, she measured how the children were functioning, identified three parenting styles, and described typical behavior patterns of children raised according to each (see Table 3).

**Authoritarian parenting** emphasizes control and unquestioning obedience. Authoritarian parents try to make children conform to a set standard of conduct and punish them forcefully for violating it. They are less warm than other parents. Their children tend to be more discontented, withdrawn, and distrustful.

**Permissive parenting** emphasizes self-expression and self-regulation. Permissive parents make few demands. They consult with children about policy decisions and rarely punish. They are warm, noncontrolling, and undemanding. Their preschool children tend to be immature—the least self-controlled and the least exploratory.

**Authoritative parenting** emphasizes a child's individuality but also stresses limits. Authoritative parents are loving and accepting but also demand good behavior and are firm in maintaining standards. They impose limited, judicious punishment when necessary, within the context of a warm, supportive relationship. Preschoolers with authoritative parents tend to be the most self-reliant, self-controlled, self-assertive, exploratory, and content.

Eleanor Maccoby and James Martin (1983) added a fourth parenting style—neglectful, or uninvolved—to describe parents who focus on their needs rather than on those of the child. Neglectful parenting has been linked with both externalizing (such as delinquency and defiance) and internalizing (such as depression and anxiety) behavioral problems in childhood and adolescence (Pinquart, 2017; Pinquart, 2016).

Why does authoritative parenting seem to enhance children's social competence? It may be because authoritative parents set sensible expectations and realistic standards. By making clear, consistent rules, they let children know what is expected of them. In authoritarian homes, children are so strictly controlled that often they cannot make independent choices about their own behavior. In permissive homes, children receive so little guidance that they may become uncertain and anxious about whether they are doing the right thing. In authoritative homes, children know when they are meeting expectations and can decide whether it is worth risking parental displeasure to pursue a goal. These children are expected to perform well, fulfill commitments, and participate actively in family duties as well as family fun. They know the satisfaction of accepting responsibilities and achieving success.

**Criticisms of Baumrind's Model** In research based on Baumrind's work, the benefits of authoritative parenting have generally been supported (Steinberg, 2014). This

**TABLE 3** Parenting Styles

		WARMTH	
		High	Low
CONTROL	High	Authoritative	Authoritarian
	Low	Permissive	Neglectful

is important because identifying and promoting positive parenting practices is crucial to preventing early-onset problem behavior. However, Baumrind's findings are correlational. Thus, they merely establish associations between each parenting style and a particular set of child behaviors. They do not show that different styles of child rearing cause children to be more or less competent. As with all correlations, the direction of effects is not certain.

Moreover, Baumrind did not consider innate factors, such as temperament, that might have influenced the parents. An easy child might, for example, elicit authoritative parenting, and a difficult child, more power assertive techniques as parents search for a way to manage their defiance. Baumrind's model is unidirectional and addresses only the parent's effect on the child's behavior. In reality, such interactions are reciprocal.

Additionally, parents may use different techniques at different points. For example, a parent might behave in an authoritative fashion over a child's clothing choices but be more authoritarian when addressing issues of safety. Additionally, parents do not always share a parenting style (Tavassolie et al., 2016). Particularly in cultures with traditional gender roles, mothers and fathers may differ in their parenting approach.

**Cultural Differences in Parenting Styles** Another concern is that Baumrind's categories reflect a biased view of child development. Some researchers have argued that while authoritative parenting may be a beneficial parenting strategy for children within dominant US culture, it may not function in the same way across different ethnic or cultural groups.

In countries such as the United States, the traits of independence and initiative are highly valued. Moreover, constraints on behavior are often viewed negatively. Among Asian Americans, obedience and strictness are not necessarily associated with harshness and domination but instead with caring, concern, and involvement. Traditional Chinese culture, with its emphasis on respect for elders, diligence, and obedience, stresses one's individual responsibility to maintain the social order. This obligation is modeled through firm and just control and governance of the child and even by physical punishment if necessary (Zhao, 2002). Although Asian American parenting is frequently described as authoritarian, the warmth and supportiveness that characterize Asian family relationships may more closely resemble Baumrind's authoritative parenting but without the emphasis on the European American values of individuality, choice, and freedom (Chao, 1994) and with stricter parental control (Chao, 2001).

As another example, Mexican American families tend to use more authoritarian parenting than European American families, perhaps in line with the respect for authority characteristic of Mexican culture, to no ill effect (Varela et al., 2004). In African American families, who tend to use more physical punishment, authoritarian parenting is not related to negative behavioral outcomes, although this relationship does exist for White families (Baumrind, 1987; McLeod et al., 1994). Other evidence suggests that despite the association between parenting style and later academic achievement in European American teens, it is not necessarily associated with such outcomes in Latino, Asian, or African American adolescents (Dornbusch et al., 1987; Steinberg et al., 1992). Still, there are similarities. Across the globe, authoritative parenting is associated with at least one positive outcome and authoritarian parenting is associated with at least one negative outcome in all regions of the world (Pinquart & Rubina, 2018).



*Traditional Asian culture stresses adults' responsibility to maintain the social order by teaching children socially proper behavior.*

gahsoon/E+/Getty Images

### checkpoint can you . . .

- Summarize Baumrind's model of parenting styles?
- Discuss criticisms of Baumrind's model and cultural variations in parenting styles?

# Relationships with Other Children

Although the most important people in young children's world are the adults who take care of them, relationships with siblings and playmates become more important in early childhood.

Younger siblings are more likely to take risks than older siblings. In one study of baseball statistics, 90 percent of younger brothers in Major League Baseball stole more bases than their older counterparts (Sulloway & Zweigenhaft, 2010).



## SIBLING RELATIONSHIPS

The earliest, most frequent, and most intense disputes among siblings are over property rights or access to the mother. Although exasperated adults may not always see it that way, sibling disputes and their settlement are socialization opportunities in which children learn to stand up for principles and negotiate disagreements, in part because the involuntary nature of the relationship ensures that interactions will continue (Kramer, 2014). Another arena for socialization is joint dramatic play. Siblings who frequently play "let's pretend" develop a history of shared understandings that enable them to more easily resolve issues and build on each other's ideas (Howe et al., 2005).

Conflict is common in siblings: In an hour, 2- to 4-year-old siblings will have an average of 7.65 disputes (Perlman & Ross, 2005). Despite the frequency of conflict, sibling rivalry is not the main pattern between brothers and sisters early in life. Affection, interest, companionship, and influence are also prevalent in sibling relationships. Indeed, prosocial and play-oriented behaviors are more common than rivalry, hostility, and competition. Older siblings initiate more behavior, both friendly and unfriendly, whereas younger siblings tend to imitate the older ones. As the children age, they tend to become less physical and more verbal in showing both aggression and care and affection (Abramovitch et al., 1986). Because older siblings tend to dominate younger ones, the quality of the relationship is more affected by the emotional and social adjustment of the older child than the younger one (Pike et al., 2005). Generally, same-sex siblings, particularly girls, are closer and play together more peacefully than boy-girl pairs (Kier & Lewis, 1998).

The quality of sibling relationships tends to persist over time (Pike & Oliver, 2017) and to carry over to relationships with other children. A child who is aggressive with siblings is likely to be aggressive with friends as well (Vlachou et al., 2011; Abramovitch et al., 1986). Siblings who have a high-quality relationship together tend to develop prosocial behaviors, which in turn enhances their relationships with friends (Smorti & Ponti, 2018). Likewise, friendships can influence sibling relationships. Older siblings who have experienced a good relationship with a friend before the birth of a sibling are likely to treat their younger sibling better and are less likely to develop antisocial behavior in adolescence (Kramer & Kowal, 2005). For a young child at risk for behavioral problems, a positive relationship with either a sibling or a friend can buffer the effects of a negative relationship with the other (McElwain & Volling, 2005).

## THE ONLY CHILD

In the United States, approximately 18 percent of families have only one child (Gao, 2015). Are only children selfish, lonely, or spoiled? Generally, this stereotype of only children appears to be false. A meta-analysis of 115 studies found that most "onlys" do well. With respect to academic outcomes and success in work, they perform slightly better than children with siblings. They tend to be more motivated to achieve and to have slightly higher self-esteem; and they do not differ in emotional adjustment, sociability, or popularity (Mancillas, 2006).

Why do onlys do better on some indices than children with siblings? Only children may do better because parents focus more attention on only children, talk to

them more, and expect more of them than do parents with more than one child (Falbo, 2006). The more children in a family, the less individual time any one child receives. Given that children today spend considerable time in play groups, child care, and preschool, only children do not lack opportunities for social interaction with peers.

Research in China also has produced largely encouraging findings about only children. In 1979, to control an exploding population, the People's Republic of China established an official policy of limiting families to one child each. Although the policy has since been relaxed, most urban families now have only one child, and most rural families no more than two (Feng et al., 2016; Hesketh et al., 2005). This situation offered researchers a natural experiment: an opportunity to study the adjustment of large numbers of only children.

Only children seem to be at an advantage, at least in China. Those with siblings reported higher levels of fear, anxiety, and depression than only children, regardless of sex or age (Yang et al., 1995). As adults, only children, overall, were less likely to show signs of anxiety or depression than those children born in families with siblings, particularly if they were born after the policy was reversed (Falbo & Hooper, 2015). Among 4,000 third and sixth graders, personality differences between only children and those with siblings—as rated by parents, teachers, peers, and the children themselves—were few. Only children's academic achievement and physical growth were about the same as, or better than, children with siblings, although the differences were small (Falbo, 2012; Falbo & Poston, 1993). This finding may reflect the greater attention, stimulation, hopes, and expectations that parents shower on a baby they know will be their first and last.

## PLAYMATES AND FRIENDS

Friendships develop as people develop. Toddlers play alongside or near each other, but not until about age 3 do children begin to have friends. Through friendships and interactions with casual playmates, young children learn how to get along with others. They learn that being a friend is the way to have a friend. They learn how to solve problems in relationships and how to put themselves in another person's place, and they see models of various kinds of behavior. They learn moral values and gender-role norms, and they practice adult roles.

Preschoolers usually like to play with children of the same age, at least in developed countries (see Window on the World for information on cultural variations). Preschoolers also tend to segregate by sex. Children who have frequent positive experiences with each other are most likely to become friends (Rubin et al., 1998; Snyder et al., 1996; Shin et al., 2011). About 3 out of 4 preschoolers have such mutual friendships (Hartup & Stevens, 1999).

The traits that young children look for in a playmate are similar to the traits they look for in a friend (Hart et al., 1992). In one study, 4- to 7-year-olds rated the most important features of friendships as doing things together, liking and caring for each other, sharing and helping one another, and to a lesser degree, living nearby or going to the same school. Younger children rated physical traits, such as appearance and size, higher than older children did and rated affection and support lower (Furman & Bierman, 1983). Preschool children prefer prosocial playmates who like to play the same way and with the same things they do, and they reject disruptive, demanding, intrusive, or aggressive children



*Young children learn the importance of being a friend to have a friend.*  
Gabriela Martorell



## AGE SEGREGATION VERSUS MIXED-AGE PLAY

Historically, people of different ages mixed together. Families were bigger, and children and adults often worked and played side by side. If they went to school, children were often assigned to classes based on how much they knew rather than when they were born (Neyfakh, 2014), and particularly in rural areas, many schools consisted of one or a few rooms in which children of different ages were taught together.

In most developed countries today, as soon as children enter day care or school, many of their activities are structured by age. This is a recent change over the past 100 years and is related to the increased industrialization in society and the advent of compulsory education (Rogoff, 2003).

Parents sometimes believe that younger and older children do not have much to share and assume that children learn little from mixed-aged groupings. However, younger and older children both benefit from age mixing. Younger children learn by watching and modeling the older children's behavior and by participating in activities alongside them. Older children can develop their leadership abilities and serve as mentors. They expand their comprehension through teaching. This interaction helps to enhance their creativity and allows them to develop their ability to nurture and care for others (Gray, 2011).

Research backs up these assertions. For example, in Mexico, one study demonstrated that older siblings exhibited teaching behavior and the younger siblings learned by both observation and direct assistance

from their siblings during playtime (Maynard, 2002). In Kenya, another study showed that boys who helped their mothers care for younger siblings were on average kinder, more helpful, and less aggressive than boys who did not have such experience (Gray, 2011). Researchers in Samoa found that young children learned about fishing and politics while in the presence of adults by observation without any intentional instruction (Odden & Rochat, 2004). Last, research in classroom settings indicates that academic achievement in mixed-grade classrooms is the same as, or slightly better than, in same-grade classrooms. Children in mixed-age classrooms are self-directed and more likely to cooperate with each other, engage in collaboration, and take charge of their own education (Reese, 1998).

While children can learn a great deal from those who are similar to them in age, there is also value in interactions with others of different ages. Cultures tend to gravitate toward one or the other dimension, but it may be that the ideal situation is a mix of the two approaches.



What do you think is better for children: mixed-age or age-segregated? Do you think it matters if their interactions are in play or in educational settings?

### checkpoint can you... ?

- Explain how the resolution of sibling disputes contributes to socialization?
- Compare the development of only children with that of children with siblings?
- Discuss how preschoolers choose playmates and friends, how they behave with friends, and how they benefit from friendships?

(Hart et al., 1992; Rekalidou & Petrogiannis, 2012; Ramsey & Lasquade, 1996; Roopnarine & Honig, 1985).

Overall, peer relationships are important for psychosocial development (Bukowski et al., 2018). Well-liked preschoolers and kindergartners and those who are rated by parents and teachers as socially competent generally cope well with anger. They avoid insults and threats. Instead, they respond directly, in ways that minimize further conflict and keep relationships going (Fabes & Eisenberg, 1992). Children who are not liked by their peers are not as good at communicating with others (van der Wilt et al., 2020), and they are more likely to be aggressive or withdrawn (Newcomb et al., 1993). These poor relationships put them at risk for negative outcomes in adolescence and adulthood (Prinstein et al., 2018).

# summary and key terms

## The Developing Self

- The self-concept undergoes major change in early childhood. According to a neo-Piagetian model, self-definition shifts from single representations to representational mappings. Young children do not see the difference between the real self and the ideal self.
  - Self-esteem in early childhood tends to be global and unrealistic, reflecting adult approval.
  - Understanding of emotions directed toward the self and of simultaneous emotions develops gradually.
  - According to Erikson, the developmental conflict of early childhood is initiative versus guilt. Successful resolution of this conflict results in the virtue of *purpose*.
- self-concept** (227)  
**self-definition** (227)  
**real self** (227)  
**ideal self** (227)  
**disability** (229)  
**self-esteem** (230)  
**social emotions** (232)  
**initiative versus guilt** (232)

## Gender

- Gender identity is an aspect of the developing self-concept.
- The main gender difference in early childhood is boys' greater aggressiveness. Girls tend to be more empathic and prosocial and less prone to problem behavior. Some cognitive differences appear early but others not until preadolescence or later.
- Children learn gender roles at an early age through gender-typing. Gender stereotypes peak during the preschool years.
- Five major perspectives on gender development are biological, evolutionary, psychoanalytic, cognitive, and social learning.
- Evidence suggests that some gender differences may be biologically based.
- Evolutionary theory sees children's gender roles as preparation for adult mating behavior.
- In Freudian theory, a child identifies with the same-sex parent after giving up the wish to possess the other parent.
- Cognitive-developmental theory maintains that gender identity develops from thinking about one's gender.

According to Kohlberg, gender constancy leads to acquisition of gender roles. Gender-schema theory holds that children categorize gender-related information by observing what males and females do in their culture.

- According to social cognitive theory, children learn gender roles through socialization. Parents, peers, and culture influence gender-typing.

**gender identity** (233)  
**gender roles** (234)  
**gender-typing** (234)  
**gender stereotypes** (234)  
**transgender people** (235)  
**intersex people** (235)  
**gender dysphoria** (235)  
**theory of sexual selection** (236)  
**identification** (237)  
**gender constancy** (237)  
**gender-schema theory** (238)  
**social cognitive theory** (239)

## Play

- Play has physical, cognitive, and psychosocial benefits. Changes in the types of play children engage in reflect cognitive and social development.
- According to Smilansky, children progress cognitively from functional play to constructive play, dramatic play, and then formal games with rules. Dramatic play becomes increasingly common during early childhood and helps children develop social and cognitive skills. Rough-and-tumble play also begins during early childhood.
- According to Parten, play becomes more social during early childhood. However, later research has found that non-social play is not necessarily immature.
- Children prefer to play with (and play more socially with) others of their sex.

- Cognitive and social aspects of play are influenced by the culturally approved environments adults create for children.

**functional play** (242)  
**constructive play** (242)  
**dramatic play** (242)  
**formal games with rules** (242)  
**gender segregation** (243)

## Parenting

- Discipline can be a powerful tool for socialization.
- Both positive reinforcement and prudently administered punishment can be appropriate tools of discipline within the context of a positive parent-child relationship.
- Power assertion, inductive techniques, and withdrawal of love are three categories of discipline. Induction is generally the most effective and power assertion the least effective in promoting internalization of parental standards. Spanking and other forms of corporal punishment can have negative consequences.
- Baumrind identified three parenting styles: authoritarian, permissive, and authoritative. A fourth style, neglectful or uninvolved, was identified later. Authoritative parents tend to raise more competent children. However, Baumrind's findings have been critiqued for being too simplistic and culturally biased.
- The roots of altruism and prosocial behavior appear early. This may be an inborn disposition, which can be cultivated by parental modeling and encouragement.
- Instrumental aggression—first physical, then verbal—is most common in early childhood.
- Boys tend to practice overt aggression, whereas girls often engage in relational aggression.
- Preschool children show temporary fears of real and imaginary objects and events; older children's fears tend to be more realistic.

**discipline** (245)

**corporal punishment** (246)

**inductive techniques** (247)

**power assertion** (247)

**withdrawal of love** (247)

**authoritarian parenting** (248)

**permissive parenting** (248)

**authoritative parenting** (248)

## Relationships with Other Children

- Most sibling interactions are positive. Older siblings tend to initiate activities and younger siblings to imitate. Same-sex siblings, especially girls, get along best.
- Siblings tend to resolve disputes on the basis of moral principles.
- The kind of relationship children have with siblings often carries over into other peer relationships.
- Only children seem to develop at least as well as children with siblings.
- Preschoolers choose playmates and friends who are like them and with whom they have positive experiences.
- Aggressive children are less popular than prosocial children.

Design elements: (Butterfly Icon): Stockbyte/Getty Images; (World Icon): janrysavy/Getty Images



## outline

### PHYSICAL DEVELOPMENT

Aspects of Physical Development  
Physical Health

### COGNITIVE DEVELOPMENT

Piagetian Approach: Cognition  
Information-Processing Approach:  
Planning, Attention, and Memory  
Psychometric Approach: Intelligence  
Language and Literacy  
The Child in School  
Educating Children with Special  
Needs

## learning objectives

- Describe physical changes and health in school-age children.
- Describe cognitive development in school-age children.
- Explain how language abilities continue developing in school-age children.
- Summarize children's adjustment to school and influences on school achievement.
- Describe how schools educate children with special needs.



# Physical and Cognitive Development in Middle Childhood



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## did you know?

- The COVID-19 pandemic led to declines in physical activity in children.
- Children who believe they can master schoolwork are more likely to do so.
- Studies support the value of bilingual education.

*In this chapter, we look at strength, endurance, motor proficiency, and other physical developments among 6- to 11-year-olds.*

*Cognitively, we examine concrete operations, memory, problem solving, intelligence testing, and literacy. We discuss school achievement, methods of teaching reading, and second-language education. Finally, we look at special-needs education.*

**I**t is easier to build strong children than to repair broken men.

—Frederick Douglass (1818–1895)

## PHYSICAL DEVELOPMENT

### Aspects of Physical Development

Growth during middle childhood slows considerably. Still, although day-by-day changes may not be obvious, they add up to a startling difference between 6-year-olds, who are still small children, and 11-year-olds, many of whom are now beginning to resemble adults.

#### HEIGHT AND WEIGHT

Children grow about 2 to 3 inches each year between ages 6 and 11 and approximately double their weight during that period (Table 1). Girls retain somewhat more fatty tissue than boys, a characteristic that will persist through adulthood. The average 10-year-old weighs about 18 pounds more than 40 years ago (Fryar et al., 2016).

#### DENTAL HEALTH

Globally, about 560 million children have untreated tooth decay in their permanent teeth (World Health Organization, 2017). In the United States, approximately 20 percent of 5- to 11-year-old children, who hail disproportionately from lower-income families, have untreated dental decay (Centers for Disease Control and Prevention, 2021). There are disparities by racial and ethnic group in the United States as well: 12.1 percent of non-Hispanic White children, 22.6 percent of African American children, and 18.4 percent

**TABLE 1** Physical Growth, Ages 6 to 11 (50th percentile\*)

Age	HEIGHT (INCHES)		WEIGHT (POUNDS)	
	Girls	Boys	Girls	Boys
6	46.8	46.8	52.3	52.6
7	48.9	49.7	60.2	61.0
8	51.1	52.0	69.1	69.8
9	53.9	53.5	76.9	78.1
10	56.3	55.8	90.6	89.8
11	59.2	58.8	106.1	102.6

\*Fifty percent of children in each category are above this height or weight level, and 50 percent are below it.

Source: Fryar et al. (2021).

of Hispanic children have untreated cavities (US Department of Health and Human Services, 2020).

Although tooth decay is still a common untreated condition, children's oral health has improved dramatically from previous decades. The improvements can be attributed to a variety of factors, including parental education, access to dental care, fluoridated water supplies or the use of fluoride supplements (discussed in Chapter 7), as well as the increased use of adhesive sealants on rough chewing surfaces. Slightly over one-third of children aged 6 to 8 have a dental sealant on at least one tooth, and slightly over half of children aged 9 to 11 have a sealant. Sealants reduce tooth decay for at least 4 years after they are applied and can prevent up to 80 percent of dental caries.

Access to proper dental care is important for young children. Untreated dental caries can result in pain, difficulties chewing food, missed school, problems with concentration, and discomfort with appearance. Parents can help prevent dental caries with regular dental care, fluoridated water supplies or fluoride supplements, and the use of adhesive sealants on rough chewing surfaces (Centers for Disease Control and Prevention, 2021). Programs in which mobile dental equipment is brought to schools serving low-income families and treatment is offered to children there during the school day have been shown to be effective at reducing cavities as well as being cost-effective (Forss et al., 2013; Centers for Disease Control and Prevention, 2021).

## NUTRITION

How did the COVID-19 pandemic influence nutrition? Research shows parents and their children were more likely to engage in non-nutritive snacking during lockdown; however, they were also more likely to eat dinner together as a family (Jansen et al., 2021).



The recommended calories per day for schoolchildren 9 to 13 years of age range from 1,400 to 2,600, depending on gender and activity level. Nutritionists recommend a varied diet, including plenty of grains, fruits, and vegetables, and high levels of complex carbohydrates such as whole grains. Children, like adults, should get only about 25 to 30 percent of their total calories from fat and less than 10 percent of the total from saturated fat. They should consume less than 10 percent of their calories from added sugars (DeSalvo et al., 2016) as added sugar consumption has been linked to unhealthy weight gain (Luger et al., 2017).

Unfortunately, American children aged 6 to 11 years score a 53.9 percent average on the Healthy Eating Index, a scoring system designed to measure how well children meet dietary guidelines. Generally, scores tend to be higher in younger children, and there are no differences between boys and girls and between children of different socio-economic level (Thompson et al., 2019). Poor nutrition is not a problem limited to the United States: Children across the world eat too few fruits and vegetables and regularly consume fast food and processed snacks low in nutritive value (UNICEF, 2021).

Research across 33 different countries has shown that skipping breakfast, which occurs in 10 to 30 percent of children and rises with age, is associated with an increased risk of overweight, obesity, and cardiometabolic risk factors (Monzani et al., 2019). Snacks, too, are problematic. Most children get almost a third of their daily calories through snacks (Shriver et al., 2018) and are eating almost three snacks a day in addition to the typical breakfast, lunch, and dinner (Piernas & Popkin, 2010). In schools in which vending machines are available, 18 percent of children report buying snacks or drinks from vending machines two or more days a week rather than lunch (Park et al., 2010).

Approximately one-third of children eat at fast-food restaurants on any given day. While socioeconomic status does not seem to impact fast-food consumption, race and ethnicity do. African American (9.8 percent) and White (9.1 percent) children are more likely than Hispanic (8.4 percent) and Asian (5.0 percent) children to eat fast food (Vikraman et al., 2015). The media strongly influence children's food choices and not for the better. For example, commercials that focus on fast-food restaurants and the enticing toys they often offer are common during children's programming hours. Exposure to fast-food and soft drink advertising is associated with increased consumption of both types of products, especially in overweight or obese children (Cairns et al., 2013; Andreyeva et al., 2011). Moreover, as children move to use increasingly diverse media platforms, so do advertisers. Food marketing on social media and content delivery plat-

forms such as YouTube has increased sharply in recent years and is likewise associated with less healthy eating habits (Bragg et al., 2020).

Nutrition education in schools can be helpful when combined with parental education and changes in school lunch menus, although they have been more successful in improving fruit intake than vegetable intake (Evans et al., 2012). Additionally, efforts to combat obesity benefit from an additional focus on energy expenditure through increased activity (Kelley et al., 2015). Proposed legislative responses include changes in food labeling, taxes on unhealthy foods, restrictions on foods in government-supported school lunch programs, regulation of food advertising directed toward children, and requiring restaurants to list nutrition information on their menus.

## SLEEP

Sleep needs decline from 10 to 13 hours a day for 3- to 5-year-olds to 9 to 11 hours a day for ages 6 to 13 (Sleep Foundation, 2020). However, many children do not get enough sleep. A variety of correlates seem to be at play, including exposure to media screens, physical inactivity, secondhand smoke, poor housing, vandalism, and a lack of parks and playgrounds (Singh & Kenney, 2013). The presence of a television in the bedroom can also be highly disruptive. At the age of 7, 23 percent of children have a television in their bedroom, and increased television viewing is associated with fewer hours of sleep (Cespedes et al., 2014).

Snoring can be a marker of poor sleep. Estimates of how many children habitually snore vary widely and range from 7 to 21 percent. Whether or not a child snores can be affected by a variety of factors, including age, gender, race, family susceptibility, chronic health problems, and overweight (Goldstein et al., 2011; Bonuck et al., 2011; Li et al., 2010). Although children who snore sleep as long as do children who don't snore, their sleep is more fragmented, and fragmented sleep is associated with deficits in language and cognitive skills, fine motor skills, and activities of daily living skills, and lower scores on developmental tests (Yorbik et al., 2014). Obstructive sleep apnea, a severe form of sleep disordered breathing, is common in children and, because of the plastic nature of the brain in childhood, can result in permanent deficits in learning and behavior, as well as contribute to cardiovascular and metabolic morbidities (Bue et al., 2020). Children may be treated with surgery or may benefit from continuous positive airway pressure therapy in which an electronic device keeps airways open via air pressure delivered through a nasal mask (Gozal et al., 2020).

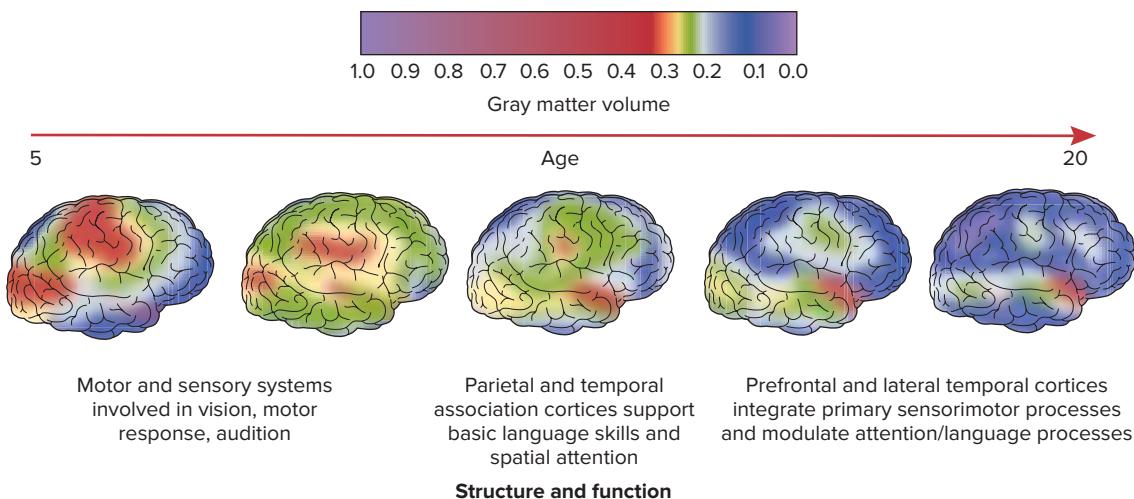
Failure to get adequate sleep is also associated with a variety of adjustment problems, and this effect is particularly marked when children are African American or come from homes of low socioeconomic status (El-Sheikh et al., 2010; Beebe, 2011). Sleep quality, sleep duration, and daytime sleepiness have all been found to affect academic performance and seem to affect younger children, particularly boys, to a greater degree (Dewald et al., 2010). Moreover, short sleep duration in children is associated with later risk of obesity (Deng et al., 2021).

## BRAIN DEVELOPMENT

A number of cognitive advances occur in middle childhood that can be traced back to changes in the brain's structure and functioning. In general, these changes can be characterized as resulting in faster, more efficient information processing and an increased ability to ignore distracting information.

Although global brain volume increases at the rate of approximately 1 percent per year from childhood to adolescence (Mills et al., 2016), grey matter and white matter follow distinct developmental trajectories. Grey matter includes the neurons themselves, along with glial cells, dendrites, blood vessels and axons, whereas white matter is composed almost exclusively of myelinated axons.

Magnetic resonance imaging shows that the amount of gray matter in the frontal cortex, which is strongly influenced by genetics, is likely linked with differences in IQ



**FIGURE 1**

### Gray-Matter Maturation in the Cerebral Cortex, Ages 5 to 20

*Losses in gray matter density reflect maturation of various regions of the cortex, permitting more efficient functioning. Blue areas correspond to specific parts of the cortex undergoing loss of gray matter at a given age. These structures and their functional significance are described.*

Source: Amso & Casey (2006); adapted from Gogtay et al. (2004).

(Toga & Thompson, 2005; Deary et al., 2010). Gray matter volume shows a U-shaped trajectory. The overall volume increases rapidly after birth, peaking in childhood. Then, in late childhood, it begins to decline and stabilizes at some point in the third decade (Tamnes et al., 2017). The decline in overall volume is driven primarily by a loss in the density of gray matter. Although “less” gray matter may sound negative, the result is actually the opposite. The “loss” reflects pruning of unused dendrites. In other words, those connections that are used remain active; the unused connections eventually disappear. The result is that the brain becomes “tuned” or calibrated to the experiences of the child.

Changes in the volume of gray matter peak at different times in the different lobes (Figure 1). The decline in gray matter volume is linearly associated with age, particularly in the occipital and parietal lobes. In the temporal and frontal lobes, gray matter volume peaks earlier (Aubert-Broche et al., 2013). Beneath the cortex, gray matter volume in the caudate—a part of the basal ganglia involved in control of movement and muscle tone and in mediating higher cognitive functions, attention, and emotional states—peaks at age 7 in girls and age 10 in boys (Lenroot & Giedd, 2006). The amount of gray matter present is associated with cognitive performance, and the strength of this association increases with age as the brain reaches a more mature state (Moore et al., 2017).

Beneath the cortex, gray matter volume in the caudate—a part of the basal ganglia involved in control of movement and muscle tone and in mediating higher cognitive functions, attention, and emotional states—peaks at age 7 in girls and age 10 in boys (Lenroot & Giedd, 2006). Gray matter volume in the parietal lobes, which deal with spatial understanding, and in the frontal lobes, which handle higher-order functions, peaks at age 11. Gray matter in the temporal lobes, which deal with language, peaks at age 14, while that in the cerebellum, which regulates motor movements, takes longer. Children’s brains also show changes in the thickness of the cortex. Overall, the volume of the cortex peaks in late childhood to early adolescence (Raznahan et al., 2011). Generally, gray matter volume peaks 1 to 2 years earlier in girls than in boys (Gogtay & Thompson, 2010).

The loss in density of gray matter with age is balanced by another change: a steady increase in white matter. The connections between neurons thicken and myelinate,

beginning with the frontal lobes and moving toward the rear of the brain. This process can be accelerated by learning or intense activity, illustrating the plastic and environmentally responsive nature of the developing brain (Fields, 2015). Between ages 6 and 13, striking growth occurs in connections between the temporal and parietal lobes and continues into adulthood (Giedd & Rapoport, 2010; Lenroot & Giedd, 2006). In addition, changes in the density of the white matter in the corpus callosum may also underlie the advances seen in fine motor control in late childhood (Muetzel et al., 2008), such as the ability to write legibly, tie shoelaces, or play musical instruments.

## MOTOR DEVELOPMENT AND PHYSICAL ACTIVITY

In the United States, school-age children now spend less time on sports and other outdoor activities than in the early 1980s and more hours on schooling, homework, and media activities (Juster et al., 2004; Basterfield et al., 2011). Fewer than 24 percent of US children ages 6 to 17 participate in the recommended 60 minutes of physical activity daily (Centers for Disease Control and Prevention, 2020), and children become increasingly less active and more sedentary with age (Nader et al., 2008).

**Cross-Cultural Research on Physical Activity** The physical activity trends found in the United States are not unique. In a meta-analysis including almost 100,000 children across 17 mostly high-income countries, children's cardiorespiratory fitness declined sharply beginning in the late 1980s but stabilized around 2015 (Föhner et al., 2021). Other research surveying over 25 million 6- to 19-year-olds in 27 countries across Africa, the Middle East, Asia, Australasia, Europe, and North America estimated aerobic fitness declined in all countries at the rate of about 0.46 percent a year (Tomkinson & Olds, 2007). Not surprisingly, other research shows that in much of the world, few children attain the recommended physical activity guidelines. In Australia, Canada, England, South Korea, Spain, Thailand, and Wales, only about a third of children are sufficiently active. In Belgium, Chile, China, Estonia, Qatar, Scotland, and the United Arab Emirates, fewer than 20 percent are (Tremblay et al., 2016).

In poorer countries with less infrastructure, children are more likely to get sufficient exercise. For example, in low- and middle-income countries lacking transportation options, active transportation (such as riding a bike or walking) is often used (Manyanga et al., 2018). Although data are sparse, indications are that the adoption of a modern lifestyle results in decreased physical activity for children. In one study, Australian aboriginal and Torres Straight Islander children were more active than their nonindigenous counterparts (Gwynn et al., 2010). Similarly, Inuit children in Canada, when living their traditional lifestyle in the high Arctic, were more physically fit than urban Canadian children. However, as they acculturated, they became increasingly sedentary, and their fitness levels approached that of the urban Canadian children (Shepherd et al., 2007).

**Recess** Cross-cultural research conducted across Europe, North America, and Asia shows that recess periods in primary school range from 15 to 150 minutes per day (Grao-Cruces et al., 2020). In the United States, most primary schools include a daily 30-minute recess period and two physical education classes a week. However, on average, primary school students spend only 15 minutes per school day engaged in vigorous- or moderate-intensity physical activity, a number that falls to 5 minutes per school day by high school (Kohl & Cook, 2013).

The games children play at recess tend to be informal. Most of recess activity involves socializing with peers, with younger children spending more time running and chasing each other (Holmes, 2012). Boys play more physically active games (Rose & Rudolf, 2006), whereas girls favor games that include verbal expression or counting aloud, such as hopscotch and jump rope (Pellegrini et al., 2002). About 10 percent of schoolchildren's free play in the early grades consists of **rough-and-tumble play**: wrestling, kicking, tumbling, grappling, and chasing, often accompanied by laughing and

- Summarize typical growth patterns of boys and girls in middle childhood, including ethnic variations?
- Summarize the nutritional and sleep needs of school-age children?
- Discuss changes in the brain at this age and their effects?

### rough-and-tumble play

Vigorous play involving wrestling, hitting, and chasing, often accompanied by laughing and screaming.



*Games at recess, such as jump rope, tend to be informal. They promote both agility and social competence.*

Lane Oatey/Blue Jean Images/Getty Images

## checkpoint can you . . .

- Contrast boys' and girls' recess-time activities?
- Explain the significance of rough-and-tumble play?
- Tell what types of physical play children engage in as they grow older?

screaming. This kind of play may look like fighting but is done playfully among friends (Jarvis, 2010).

When given the choice, most children opt to play in natural or green areas rather than on concrete (Lucas & Dymont, 2010). However, when provided with more playground equipment, children tend to be more active during recess. Not surprisingly, more space to play in also leads to higher levels of activity, and children tend to decrease their activity levels as the temperature rises (Ridgers et al., 2010).

Contrary to the perception that recess takes time away from learning, recess is associated with improvements in academic performance (Murray et al., 2013). The improvements may stem from the changes in behavior that occur after children are allowed free time. A meta-analysis showed that after recess, children were better able to focus on class material; they were less fidgety, less listless, more focused and on task, and this was true whether or not recess involved physical interaction or social activity (Rasberry et al., 2011).

**Organized Sports** Estimates are that approximately 38 percent of 6- to 12-year-old children played team sports on a regular basis in 2018, a slow but steady decline from 44.5 percent in 2008. Household income was a major factor impacting the ability of children to participate. In 2018, slightly under 22 percent of children from families that made less than \$25,000 a year participated in organized sports on at least one day that year, whereas over 42 percent of children from families that made more than \$100,000 did (The Aspen Institute, 2020). Participation in unorganized physical activity, such as bicycling and shooting baskets, was higher at 77.4 percent (Duke et al., 2003). As discussed below, the COVID-19 pandemic altered patterns of physical activity in children.

Developmental changes determine what types of organized sports are most effective. Six- to 9-year-olds need more flexible rules, shorter instruction time, and more free time for practice than older children. At this age, girls and boys are about equal in weight, height, endurance, and motor skill development. Older children are better able to process instruction and learn team strategies.

**The Impact of COVID-19 on Physical Activity** Early in 2020, the COVID-19 virus reached pandemic status. To curb the spread of the disease, many schools closed; most organized sports were canceled; parks, playgrounds, trails and beaches were closed; and social distancing guidelines were recommended. These measures were necessary; however, they limited the degree to which most children could engage in physical activity.

The number of children involved in organized sports dropped sharply in the early months of the pandemic, although White children (41 percent) were more likely to remain active in sports than Black (35 percent), Hispanic (34 percent), and Asian (33 percent) children. Participation in sports that could be played outdoors or individually, such as basketball, fared better than in sports played indoors, such as gymnastics (The Aspen Institute, 2021). The most common activities children engaged in during lockdown were free play/unstructured activities or walks, and they were most likely to exercise in their homes or neighborhood. Approximately one-third of children engaged in some form of physical activity via a remote class or streaming service (Dunton et al., 2020). However, research conducted in the wake of the virus showed children became less physically active and more sedentary, and showed disrupted sleep schedules (Bates et al., 2020). Moreover, some data suggested the tendency of families to stock up on shelf-stable foods during the pandemic resulted in increased consumption of high-calorie, processed foods (Rundle et al., 2020).

The decreases in physical activity are likely to result in weight gain and declines in health, and are likely to more severely impact urban children without access to safe outdoor spaces (Rundle et al., 2020). Children with access to outdoor spaces such as a yard were more likely to engage in physical activity and less likely to show signs of depression or anxiety or fight with their family members (Francisco et al., 2020). There

are concerns that these changes in physical activity levels and sedentary activity will, with the continuing influence of the virus, become ingrained in children and lead to increased risk of disease.

# Physical Health

The development of vaccines for major childhood illnesses has made middle childhood a relatively safe time of life in most of the world. Still, too many children are overweight, and some suffer from chronic medical conditions, accidental injuries, or lack of access to health care.

## OVERWEIGHT

Overweight, a body mass index between the 85th and 95th percentile, and obesity, a body mass index over the 95th percentile, have become a major health issue for children worldwide. The prevalence rate has risen sharply: In 1975, just over 4 percent of children and teens ages 5 to 19 were overweight or obese. In 2016, 18 percent—or more than 340 million children and adolescents—were overweight or obese. Worldwide, the obesity rate has tripled since 1975. While overweight and obesity were once considered to be problems of high-income and urban countries, they are now found in low- and middle-income countries as well. In fact, many of these countries now carry a double burden and must manage the twin issues of undernutrition and obesity and overweight at the same time (World Health Organization, 2021).

In the United States, about 19.3 percent of children between the ages of 2 and 19 are obese, and another 16 percent are overweight. Boys are slightly more likely to be overweight than girls. Although overweight has increased in all ethnic groups, it is most prevalent among Mexican American boys (29.2 percent) and African American girls (29.1 percent). While Asian Americans show lower rates of overweight and obesity, there are indications they may have more body fat than Caucasian (White) children, and thus their health risks may begin at a lower weight compared to other ethnic groups (Fryar et al., 2020).

**Causes of Overweight and Obesity** Obesity can result from an inherited tendency aggravated by too little exercise and too much or the wrong kinds of food (Sahoo et al., 2015). Children are more likely to be overweight if they have overweight parents or other relatives, or are inactive. Television viewing appears to be an important variable and has been associated with an increased risk of obesity in both developing and developed nations (Katzmarzyk et al., 2015). Poor nutrition, encouraged by media advertising and the wide availability of snack foods and beverages, also contributes (Braithwaite et al., 2014; Bradley et al., 2011). Eating out is another culprit; children who eat outside the home consume an estimated 200 more calories a day than when they eat at home (French et al., 2001). Eating fast food has been associated with overweight and obesity (Braithwaite et al., 2014), and on a typical day, approximately one-third of children and adolescents report eating fast foods high in fat, carbohydrates, and sugar (Vikraman et al., 2015).

Where children live also matters. Children who live in rural areas have a 26 percent higher risk of obesity than children who live in urban areas, although the reasons for this are unclear (Johnson & Johnson, 2015). Additionally, children who live in public housing or unsafe neighborhoods with no facilities for outdoor exercise are most likely to be sedentary (Council on Sports Medicine and Fitness & Council on School Health, 2006). Additionally, physical inactivity and sedentary behaviors differ among children in various ethnic groups. For example, immigrant children are significantly more likely to be physically inactive and less likely to participate in sports than native children (Singh et al., 2013).

**Overweight and Obesity Outcomes** The adverse health effects of obesity for children are similar to those faced by adults. These children commonly have medical problems,



*What's in children's lunch boxes? The typical composition is one sandwich, one piece of fruit, and one and a half "extras." The number of extras, which are more likely to be processed and low in nutritional value, peaks on Wednesdays (Brennan et al., 2010).*

Barbie acts as a model for young girls, transmitting cultural ideals of beauty. However, the doll's body proportions present an unattainable female image. If she were real, Barbie would have a 39-inch bust, an impossibly small 18-inch waist, and 33-inch hips (Dittmar et al., 2006; Lind & Brzuzy, 2008).

Cookie Monster's favorite cookie is chocolate chip, followed by oatmeal. However, since 2006, Cookie Monster admits that cookies are best used as "sometimes snacks."

## checkpoint can you ...

- Discuss the extent of childhood obesity, how it can affect health, and how it can be treated?



Promoting an active lifestyle through both informal and organized sports is an important way to combat the problem of childhood obesity.

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including high blood pressure, high cholesterol, and high insulin levels, or they may develop such diseases at a younger age (Sahoo et al., 2015). Some data show that obese boys have higher levels of cardiometabolic risk factors than obese girls, suggesting they may be at even greater risk for developing disease (Skinner et al., 2015). Childhood diabetes is one of the prime results of rising obesity rates (Malik et al., 2010).

There are also socioemotional consequences to obesity. Overweight and obese children are often bullied, they report having fewer friends, and they must contend with negative stereotypes and social marginalization. Not surprisingly, obesity increases the likelihood of children developing emotional problems, and, in boys, it increases problems with peers (Black & Kassenboehmer, 2021). Moreover, obese children are at elevated risk for depression and anxiety disorders, low self-esteem, and body dissatisfaction. Additionally, there are often academic consequences. Some of the academic consequences can be attributed to a higher likelihood of school problems. However, obese children are also more likely to miss school due to health issues that co-occur with obesity, such as diabetes and asthma (Sahoo et al., 2015).

Overweight children are 5 times more likely to be obese in adulthood than children who are not obese (Simmonds et al., 2016), and they are at risk for problems in adulthood with hypertension (high blood pressure), heart disease, orthopedic problems, diabetes, and more (Sahoo et al., 2015). Indeed, childhood obesity may be a stronger predictor of some diseases than adult obesity (Baker et al., 2007) and may put children at risk of premature death (Franks et al., 2010).

**Prevention and Treatment** Childhood obesity rates continue to rise at alarming rates, particularly in African American and Hispanic children, and children from urban areas (Skinner et al., 2018; Ogden et al., 2018). The US Preventive Services Task Force (USPSTF, 2010) recommends screening children for overweight and obesity starting at the age of 6 years.

A typical weight in childhood does not guarantee a healthy weight in adulthood. Seventy percent of obese adults were not obese in childhood (Simmonds et al., 2016). Thus, prevention and intervention programs should target health in all children, not just overweight children.

Research supports efforts focused on overall lifestyle changes rather than narrowly defined diets or exercise programs. Recommendations include spending less time in front of television and computers, changes in food labeling and advertising, healthier school meals, education to help children make better food choices, and spending more time in physical education and informal exercise with family and friends, such as walking and unorganized sports (Evans et al., 2012; De Bourdeauhuij et al., 2011). The most effective interventions are those in which parents are helped to change their own behaviors as well as those of their children (Kitzmann et al., 2010).

## CHRONIC MEDICAL CONDITIONS

Most US children are healthy: More than 85 percent report very good or excellent health (National Center for Health Statistics, 2021). When illness does occur in middle childhood, it tends to be brief. **Acute medical conditions**—occasional, short-term conditions, such as infections and warts—are common. Six or seven bouts a year with colds, flu, or viruses are typical as germs pass among children at school or at play (Behrman, 1992).

Fortunately, most children without underlying medical conditions appear to be at low risk

of complications or death as a result of contracting the novel coronavirus COVID-19 (Stokes et al., 2020). However, children with preexisting conditions, especially when those conditions are medically complex, are at significantly elevated risk of complications (Shekerdemian et al., 2020). Additionally, a minority of children, especially Black and Hispanic children, are at risk of developing multisystem inflammatory disorder 4 to 6 weeks after infection. This disorder can result in a range of symptoms, from fever and inflammation to shock and the failure of multiple organ systems (Yasuhsara et al., 2021).

According to a nationally representative survey of more than 200,000 households, an estimated 12.8 percent of US children have or are at risk for **chronic medical conditions**: physical, developmental, behavioral, or emotional conditions that persist for 3 months or more (Kogan et al., 2005). These rates have been rising, as have the rates of hospital admissions for children with more than one medically complex condition (Burns et al., 2010). Two chronic conditions that have become increasingly common are asthma and diabetes.

**Asthma** **Asthma** is a chronic, allergy-based respiratory disease characterized by sudden attacks of coughing, wheezing, and difficulty breathing. Asthma affects 262 million people a year (World Health Organization, 2021). Global prevalence has been increasing, especially in low- and middle-income countries (Ferrante & Grutta, 2018). Its prevalence in the United States is also on the rise (Akinbami, 2006). Approximately 11 percent of children are diagnosed with asthma at some point. It is more likely to be diagnosed in Black (14 percent) than in White (6 percent), Hispanic (7 percent), and Asian (4 percent) children, and is more common in children living below the poverty line (Federal Interagency Forum on Child and Family Statistics, 2021).

The causes of the asthma increases are uncertain, but a genetic predisposition is likely. For example, researchers have identified a gene variant that increases the risk of developing asthma, an effect that is exacerbated in homes where children are exposed to smoke (Çalışkan et al., 2013). Smoke exposure is a major environmental risk factor by itself, as is pollution from car emissions (Burke et al., 2012; Gasana et al., 2012). Approximately 51 percent of US children live in counties where the pollutant concentrations exceed air quality standards at least once a year (Federal Interagency Forum on Child and Family Statistics, 2021). Increasing evidence points to an association between obesity and asthma (Lang et al., 2018). There is also an association between low levels of vitamin D and increased incidence of asthma in children (Bener et al., 2012). Moreover, vitamin D enhances the anti-inflammatory effects of the inhaled steroids often used to treat asthma attacks in children (Searing et al., 2010).

**Diabetes** **Diabetes** is characterized by high levels of glucose in the blood. Worldwide, approximately 463 million people are diabetic (Saeedi et al., 2019). Incidence rates vary widely across countries, with almost 100,000 new cases diagnosed across the globe every year in children under the age of 15 (Patterson et al., 2019).

Type 1 diabetes is the result of an insulin deficiency that occurs when insulin-producing cells in the pancreas are destroyed. Type 1 diabetes accounts for 5 to 10 percent of all diabetes cases and the majority of diabetes in children under 10 years of age. Symptoms include increased thirst and urination, hunger, weight loss, blurred vision, and fatigue. Treatment includes insulin administration, nutrition management, and physical activity (American Diabetes Association, 2021). Although the majority of type 1 diabetes cases in children are diagnosed in high- and middle-income countries, the bulk of deaths resulting from type 1 diabetes occur in lower-income countries (Patterson et al., 2019). In the United States, approximately 210,000 children and adolescents have been diagnosed with diabetes (Centers for Disease Control and Prevention, 2020).

Type 2 diabetes is characterized by insulin resistance and used to be found mainly in overweight and older adults. As childhood obesity has increased, so has type 2



Although generally not an issue in the United States and most industrialized nations, diseases that cause lethargy and problems with attention threaten children in tropical countries. The cause? Tropical parasites such as hookworm or schistosomiasis (World Health Organization, 2021).

#### acute medical conditions

Illnesses that last a short time.

#### chronic medical conditions

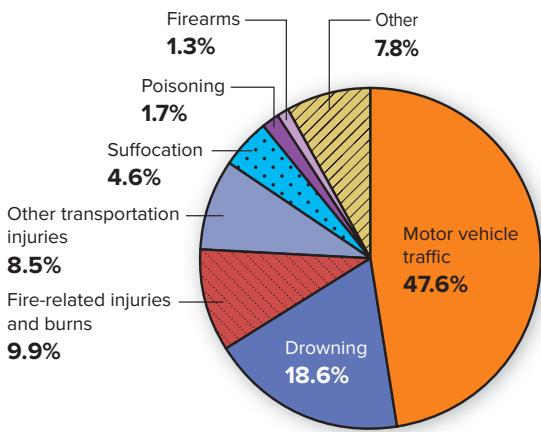
Illnesses or impairments that persist for at least 3 months.

#### asthma

A chronic respiratory disease characterized by sudden attacks of coughing, wheezing, and difficulty in breathing.

#### diabetes

(1) One of the most common diseases of childhood. It is characterized by high levels of glucose in the blood as a result of defective insulin production, ineffective insulin action, or both. (2) Disease in which the body does not produce or properly use insulin, a hormone that converts sugar, starches, and other foods into energy needed for daily life



**FIGURE 2**

## Accidental Deaths for Children Ages 5-9

Traffic accidents, drowning, and burns are the most common causes of accidental deaths among children under 18 years of age.

Source: Centers for Disease Control and Prevention (2021).

### hypertension

Chronically high blood pressure.

Children with ADHD or attentional difficulties are more accident prone (Lange, 2016).



About half of kids who drown do so within 25 yards of an adult. This happens partly because drowning doesn't look like it does in movies. A drowning child does not yell for help or splash. Signs to look for? Head low in the water, perhaps tilted back with hair covering the eyes, silence, glassy or closed eyes, mouth at or slightly below the water line, and ineffective attempts to roll over to the back or swim (Vittone, 2010).



Although high blood pressure in childhood is not generally associated with mortality as it is in adulthood, it does put children at risk for later disease and is associated with damage to organs. For example, it can lead to left ventricular hypertrophy (thickening and hardening of the left wall of the heart), damage to the retina of the eyes, or damage to arteries (Falkner, 2010). Additionally, there are indications that high blood pressure may negatively affect the developing brain. Children with hypertension have lower neurocognitive test performance than their unaffected peers (Lande & Kupferman, 2019).

Weight reduction through dietary modification and regular physical activity is the primary treatment for overweight-related hypertension. Recommendations also include stress reduction, possibly via the use of meditation. If blood pressure does not come down, drug treatment can be considered. (Flynn et al., 2017). However, care must be taken in prescribing such drugs, as their long-term effects on children are uncertain.

## ACCIDENTAL INJURIES

As in early childhood, accidental injuries are the leading cause of accidental death among school-age US children (Centers for Disease Control and Prevention, 2021; Figure 2). In 2019, 673 US children between the ages of 5 and 9 years died in accidents, the majority—340—in car accidents (Centers for Disease Control and Prevention, 2020).

An estimated 70 percent of children in the United States ride bicycles (Mattei et al., 2012). Unfortunately, despite laws requiring the wearing of bicycle helmets, their use is still low (Kaushik et al., 2015). An estimated 23,000 children each year suffer serious brain injuries from bicycle accidents, and as many as 88 percent of these injuries could be prevented by using helmets (AAP Council on Injury and Poison Prevention, 2001). Protective headgear also is vital for baseball, softball, football, roller-skating, in-line skating, skateboarding, scooter riding, horseback riding, hockey, speed sledding, snowmobiling, skiing, snowboarding, and tobogganing. In soccer,

diabetes. Because type 2 diabetes is associated with lifestyle factors, especially obesity, there is great variability in risk across countries. This factor, in conjunction with differential access to medical care and varied screening and research methodologies, makes accurate estimates challenging. However, some trends have emerged. Across different countries, ethnic minority children have higher rates of type 2 diabetes than White children, girls are at higher risk than boys, and the incidence risk rises over the course of childhood with age (Farsani et al., 2013).

Each year about 3,700 US children are diagnosed with type 2 diabetes, with higher incidence among White, Hispanic, and African American children (Dabelea et al., 2014). Symptoms are similar to those of type 1 diabetes. Nutrition management and increased physical activity can be effective treatments, although glucose-lowering medication or insulin may be needed.

**Childhood Hypertension** Hypertension, or high blood pressure, was once rare in childhood, but it has become increasingly common, especially among ethnic minorities. Globally, estimates are that approximately 3.28 percent of 6-year-old children have hypertension, a number that rises to almost 8 percent at 14 years of age (Song et al., 2019). Risk factors include obesity or overweight, salt intake, sedentary lifestyle, poor sleep quality, and race (Bucher et al., 2013; Rosner et al., 2013).

“heading” the ball should be minimized because of the danger of brain injury (Briskin et al., 2012).



# COGNITIVE DEVELOPMENT

## Piagetian Approach: Cognition

At about age 7, according to Piaget, children enter the stage of **concrete operations** when they can use mental operations, such as reasoning, to solve concrete problems. Children can think logically because they can take multiple aspects of a situation into account. However, their thinking is still limited to real situations in the here and now.

### COGNITIVE ADVANCES

In the stage of concrete operations, children have a better understanding than preoperational children of spatial concepts, causality, categorization, inductive and deductive reasoning, conservation, and number (Table 2).

Piaget maintained that the shift from the rigid, illogical thinking of younger children to the flexible, logical thinking of older children depends in part on neurological development, a belief that has been bolstered by research in brain imaging. Broadly, during the preoperational stage, there is rapid development of the prefrontal cortex, an increase in the volume of grey and white matter in the brain, extensive synaptic pruning, and continuing myelination of axons. These brain changes are believed to underlie the advances in shifting attention, inhibiting incorrect responses, and manipulating items in working memory—all abilities used in correctly solving Piagetian tasks (Bolton & Hattie, 2017).

- Distinguish between acute and chronic medical conditions?
- Discuss the incidence and causes of asthma and diabetes?
- Identify factors that increase the risks of accidental injury?

#### concrete operations

Third stage of Piagetian cognitive development (approximately ages 7 to 12), during which children develop logical but not abstract thinking.

**TABLE 2** Advances in Selected Cognitive Abilities during Middle Childhood

Ability	Example
<b>Spatial thinking</b>	Keisha can use a map or model to help her search for a hidden object. She can find her way to and from school, estimate distances, and judge how long it will take her to get somewhere.
<b>Cause and effect</b>	Douglas knows which physical attributes of objects on each side of a scale will affect the result (i.e., the number of objects matters but color does not). He does not know which spatial factors make a difference.
<b>Categorization</b>	Elena can sort objects into categories, such as shape, color, or both. She knows that a subclass (roses) has fewer members than the class of which it is a part (flowers).
<b>Seriation</b>	Catherine can arrange a group of sticks in order from the shortest to the longest and can insert an intermediate-size stick into the proper place. She knows that if one stick is longer than a second stick and the second stick is longer than a third, then the first stick is longer than the third.
<b>Inductive and deductive reasoning</b>	Dominic can solve both inductive and deductive problems and knows that inductive conclusions (based on particular premises) are less certain than deductive conclusions (based on general premises).
<b>Conservation</b>	Sol, at age 7, knows that if a clay ball is rolled into a sausage, it still contains the same amount of clay (conservation of substance). At age 9, he knows that the ball and the sausage weigh the same. Not until early adolescence will he understand that the objects will displace the same amount of liquid if dropped in water.
<b>Number and mathematics</b>	Kevin can count in his head, can add by counting up from the smaller number, and can do simple story problems.

**Spatial Relationships** Eight-year-old Ella stares intently at the map. “The star means we are here,” she points, “so that must mean the store is there!” Ella turns to her mother with a smile, and they both begin walking.

Ella is now in the stage of concrete operations. She is better able to understand spatial relationships. This allows her to interpret a map, estimate the time to get from one place to another, and remember routes and landmarks. Children are more easily able to navigate a physical environment with which they have experience, and training can help improve spatial skills as well (Uttal et al., 2013). This is important, as the ability to engage in numerical reasoning is associated with spatial visualization (Hawes & Anzari, 2020).

**Causality** Another key development during middle childhood involves the ability to make judgments about cause and effect. For example, when 5- to 12-year-old children are asked to predict how balance scales work, older children give more correct answers. In addition, earlier in middle childhood, they understood the number of objects on each side of a scale matters, but it is not until later they understood that the distance of objects from the center of a scale is also important (Amsel et al., 1996).

As children learn more about the world, their growing knowledge informs the quality of their reasoning. For example, in one study, children ages 3 to 11 years were given information about oral health that was either consistent (e.g., going to the dentist is good for teeth) or inconsistent (e.g., drinking cola is good for teeth) with reality and scenarios in which the outcome was either good or bad oral health. Children were then asked how the causal association provided in the scenarios might be tested. When the information was consistent with reality and had a good outcome, or inconsistent and had a bad outcome, children were more likely to use appropriate hypothesis testing (i.e., manipulate only one variable at a time). In other conditions, they used scientifically invalid procedures (e.g., changing all variables at a time) (Croker & Buchanan, 2011). Thus, the quality of their reasoning was better when they were able to use their understanding of the world to inform their thinking. Moreover, children are better at causal reasoning when they have the opportunity to explain and collaborate with others. For instance, they may seek knowledge about causality by asking “why” questions of their parents or exploring their environments jointly with another person (Legare et al., 2017).

**Categorization** John sits at the table, working on his class project. He is making a timeline of his life. His mother has given him six photographs of himself from infancy to the current time, and John carefully lays them in order from earliest to latest.

Part of the reason John is now able to complete tasks such as this class project is because he is better able to categorize objects. One such ability is **seriation**, arranging objects in a series according to one or more dimensions. Children become increasingly better at seriation for dimensions such as time (earliest to latest), length (shortest to longest), or color (lightest to darkest) (Piaget, 1952). This is important as children’s later mathematical achievement is dependent on early numeracy (Raghubar & Barnes, 2017) and difficulties in seriation predict later learning disabilities in mathematics (Desoete, 2015).

Another development during this age involves **transitive inferences** (if  $a < b$  and  $b < c$ , then  $a < c$ ). For example, Mateo is shown three sticks. He is shown that the yellow stick is shorter than the green stick and is then shown that the green stick is shorter than the blue stick. However, he is not shown all three sticks in order of their length. If Mateo is able to understand transitive inferences, he should be able to quickly and easily infer that the yellow stick is shorter than the blue stick without physically comparing them (Piaget & Inhelder, 1967). While Piaget believed that children did not develop this ability until middle childhood, more recent research on visual preferences has shown that children as young as 15 months have some limited ability to reason in this fashion, at least for social stimuli (Gazes et al., 2017; Mou et al., 2014). As with seriation, difficulties with transitive inferences predict later difficulties with math (Schwartz et al., 2018).

#### seriation

Ability to order items along a dimension.

#### transitive inference

Understanding the relationship between two objects by knowing the relationship of each to a third object.

Class inclusion also becomes easier. **Class inclusion** is the ability to see the relationship between a whole and its parts, and to understand the categories within a whole. For example, Piaget (1964) showed preoperational children 10 flowers—seven roses and three carnations—and asked them whether there were more roses or more flowers. Children in the preoperational stage of development tended to say there were more roses because they were comparing the roses with the carnations rather than the whole bunch of flowers. Not until age 7 or 8 do children consistently report that roses are a subclass of flowers (Flavell et al., 2002). More recent research indicates that children actually do have the ability to understand the logic of class inclusion but usually fail to inhibit the incorrect response in favor of the misleading perceptual comparison (Borst et al., 2013).

#### class inclusion

Understanding of the relationship between a whole and its parts.

**Inductive and Deductive Reasoning** **Inductive reasoning** involves making observations about particular members of a class of people, animals, objects, or events, and then drawing conclusions about the class as a whole. For example, if one neighbor's dog barks and another neighbor's dog barks, then the conclusion might be that all dogs bark.

**Deductive reasoning**, by contrast, starts with a general statement—a premise—about a class and applies it to particular members of the class. If a premise is true of the whole class and the reasoning is sound, then the conclusion must be true. So, for example, if the belief is that all dogs bark and a new dog comes along, it would be reasonable to conclude that the new dog will also bark.

Piaget believed that children in the concrete operations stage of cognitive development only used inductive reasoning. Deductive reasoning, according to Piaget, did not develop until adolescence. However, research suggests Piaget underestimated the abilities of children. In one study, researchers gave inductive and deductive reasoning problems to kindergartners, second graders, fourth graders, and sixth graders. Because they did not want the children to use real-world knowledge, they used imaginary terms and words to create both inductive and deductive reasoning problems. For example, one of the inductive problems was “Tombor is a popgop. Tombor wears blue boots. Do all popgops wear blue boots?” The corresponding deductive reasoning problem was “All popgops wear blue boots. Tombor is a popgop. Does Tombor wear blue boots?” Contrary to Piagetian theory, second graders (but not kindergartners) were able to answer both kinds of problems correctly (Pillow, 2002). Moreover, children can be encouraged to reason at higher levels via training or intervention programs (Molnar, 2011; Barkl et al., 2012). Overall, when faced with inconclusive evidence, older children are more likely than younger children to realize more information is needed and ask for it to help them draw a logical conclusion, and they are also then more accurate in their problem-solving (Busch & Legare, 2019).

**Conservation** In the preoperational stage of development, children are focused on appearances and have difficulty with abstract concepts. For example, Camilla, who is at the preoperational stage of development, is likely to think that if one of two identical clay balls is rolled into a long, thin snake, it will now contain more clay because it is longer. She is deceived by appearances and thus fails this conservation task. However, Aarush, who is in the stage of concrete operations, will say that the ball and the snake still contain the same amount of clay. What accounts for his ability to understand that the amount of clay remains unchanged regardless of the form it takes?

In solving various types of conservation problems, children in the stage of concrete operations can work out the answers in their heads. Three primary achievements allow them to do this. First, they understand the principle of identity. For instance, Aarush understands that the clay is still the same clay even though it has a different shape because nothing was added or taken away from it. Second, children in the concrete operations stage understand the principle of reversibility. Aarush can picture what would happen if he went backward in time and rolled the snake

#### inductive reasoning

Type of logical reasoning that moves from particular observations about members of a class to a general conclusion about that class.

#### deductive reasoning

Type of logical reasoning that moves from a general premise about a class to a conclusion about a particular member or members of the class.



How can parents and teachers help children improve their reasoning ability?



A child who has achieved conservation of liquid knows that pouring water from a wide, short glass into a tall, thin glass does not change the volume of water, even though the shape is different.

Marmaduke St. John/Alamy Stock Photo

back into a ball. Third, children at this stage can decenter. When Camilla looked at the snake, she focused only on its length, ignoring that it was thinner and flatter than the ball of clay. She centered on one dimension (length) while excluding the other (thickness). Aarush, however, is able to decenter and look at more than one aspect of the two objects at once. Thus, although the ball is shorter than the snake, it is also thicker.

Typically, children can solve problems involving conservation of matter, such as the clay task, at about age 7 or 8. However, it is not until age 8 or 9 that children correctly solve conservation of weight tasks in which they are asked, for instance, whether the ball and the snake weigh the same. In tasks involving conservation of volume—in which children must judge whether the snake and ball displace the same amount of liquid when placed in a glass of water—children rarely answer correctly before age 12. Piaget's term for this inconsistency in the development of different types of conservation is **horizontal décalage**. Children's thinking at this stage is so concrete, so closely tied to a particular situation, that they cannot readily transfer what they have learned about one type of conservation to another type, even though the underlying principles are the same.

#### horizontal décalage

Piaget's term for an inability to transfer learning about one type of problem to other types of problems sharing the same conceptual underpinnings.

**Number and Mathematics** When 4- to 5-year-old children deal a deck of cards or distribute portions of pizza, they demonstrate that they have some intuitive understanding of fractions. However, children have more difficulty when dealing with numbers, which are more abstract. They tend not to think about the quantity a fraction represents; instead, they focus on the numerals that make it up. Thus, they may say that  $\frac{1}{2}$  plus  $\frac{1}{3}$  equals  $\frac{2}{5}$ . It is also difficult for children to grasp that  $\frac{1}{2}$  is bigger than  $\frac{1}{4}$ —that the smaller fraction ( $\frac{1}{4}$ ) has the larger denominator (Geary, 2006).

By age 6 or 7, many children can count in their heads. They also learn to count on: to add 5 and 3, they start counting at 5 and then go on to 6, 7, and 8. It may take 2 or 3 more years for them to count down for subtraction, but by age 9, most children can count up and down (Geary, 2006). Children also become more adept at solving simple story problems, such as “Pedro went to the store with \$5 and spent \$2 on candy. How much did he have left?” When the original amount is unknown—“Pedro went to the store, spent \$2, and had \$3 left. How much did he start out with?”—the problem is harder because the operation needed to solve it (addition) is not as clearly indicated. Few children can solve this kind of problem before age 8 or 9 (Resnick, 1989).

The ability to estimate progresses with age. When asked to place 24 numbers along a line from 0 to 100, kindergartners exaggerate the distances between low numbers and minimize the distances between high numbers. Most second graders produce number lines that are more evenly spaced (Siegler & Booth, 2004). Second, fourth, and sixth graders show a similar progression in producing number lines from 0 to 1,000 (Siegler & Opfer, 2003), most likely reflecting the experience older children gain in dealing with larger numbers (Berteletti et al., 2010). Practice matters; children who play board games that include linear sequences show an advantage in their number line estimation, number estimation, and counting-on skills (Whyte & Bull, 2008; Laski & Siegler, 2014). In addition to improving in number line estimation with age, school-age children also improve in computational estimation, such as estimating the sum in an addition problem; numerosity estimation, such as estimating the number of candies in a jar; and measurement estimation, such as estimating the length of a line (Booth & Siegler, 2006).

**Cultural Influences on Piagetian Task Performance** Although the structure underlying performance on Piagetian tasks appears to be universal across cultures, the pace at which performance develops is strongly influenced by culture (Mishra, 2001). In many cultures, children reach proficiency at tasks at a later age, and in some cultures, never at all (Dasen, 1975). However, this is affected by the nature of the task. Children can think more logically about things they know something about.

For example, a series of studies compared formally schooled children in Geneva with Australian hunter-gatherer indigenous children. The progression of conservation abilities in indigenous children was similar to that of the children from Geneva but occurred several years later. However, on tasks assessing the understanding of spatial relationships,

the indigenous children showed an advantage. The progression of these skills in each domain mapped onto important cultural values and tasks. The apportionment of resources in the indigenous culture did not depend on accurately segmenting items into equal amounts but rather on kinship relationships. Items were rarely counted, and there were no number words past *five*. Accurately judging amounts was not an important task in that culture. By contrast, remembering where resources, such as water, were located was an important cultural task, and thus, indigenous children were advanced in that area (Dasen, 1994).

Similarly, West African children who produced, stored, and exchanged food in markets attained proficiency at conservation of liquid tasks at an earlier age than Inuit children, who traditionally lived a hunter-gatherer lifestyle (Dasen, 1984). Likewise, Mexican children whose families made pottery and who thus had early and extensive experience with clay, showed an advantage for conservation of matter over similar children whose families did not make pottery (Price-Williams et al., 1969). In Western countries, cultural change over time can affect the timing of abilities. When 10,000 British 11- and 12-year-olds were tested on conservation of volume and weight, their performance was 2 to 3 years behind that of their counterparts 30 years earlier, presumably because teachers were focusing on the three Rs rather than hands-on experience with the way materials behaved (Shayer et al., 2007).

There are also cultural influences on mathematical abilities. Research suggests the ability to add develops through concrete experience in a cultural context (Guberman, 1996; Resnick, 1989). In a study of Brazilian street vendors ages 9 to 15, a researcher said, “I’ll take two coconuts.” Each coconut cost 40 cruzeiros; she paid with a 500-cruzeiros bill and asked, “What do I get back?” The child counted up from 80: “Eighty, 90, 100 . . .” and gave the customer 420 cruzeiros. However, when this same child was given a similar problem in the classroom to answer on paper (“What is 500 minus 80?”), he arrived at the wrong answer (Carraher et al., 1988).

Findings such as these illustrate different routes for cultural learning. Understanding emerges from culturally defined experiences, and children are more likely to learn about skills that are valued and required in their culture.



## checkpoint can you ...

- Identify six cognitive advances during middle childhood?
- Name three principles that help children understand conservation, and discuss influences on its mastery?

# Information-Processing Approach: Planning, Attention, and Memory

As children move through the school years, they make steady progress in the abilities to regulate and sustain attention, process and retain information, and plan and monitor their behavior and strategies. All of these interrelated developments contribute to **executive function**, the conscious control of thoughts, emotions, and actions to accomplish goals or solve problems.

### executive function

Conscious control of thoughts, emotions, and actions to accomplish goals or solve problems.

## EXECUTIVE FUNCTIONING

The gradual development of executive function from infancy through adolescence is the result of developmental changes in brain structure. The prefrontal cortex, the region that enables planning, judgment, and decision making, shows significant development during this period (Lamm et al., 2006). As unneeded synapses are pruned away and pathways become myelinated, processing speed improves dramatically (Williamson & Lyons, 2018; Mah & Ford-Jones, 2012). This increases the amount of information children can keep in working memory (McAuley & White, 2011). As children develop the ability to mentally juggle more concepts at the same time, they are also able to develop more complex thinking and goal-directed planning.

Another aspect of executive function involves the development of self-regulatory capacity, including the ability to regulate attention, inhibit responses, and monitor errors. Advances in these areas, as well as in working memory, occur in concert with increases in activity of frontoparietal and frontostriatal circuits (Hughes, 2011; Tau & Peterson, 2010). Language, too, matters. Children with robust language skills do well with executive function; those with language delays have difficulty (Gooch et al., 2016).

Environmental influences are also important and, given the slow rate of development of the frontal cortex, exert a relatively large effect. For example, parenting quality and family environment—including such factors as cognitive stimulation, parental scaffolding, and parental sensitivity—have been found to positively predict later executive control. Moreover, just as high-quality family environments can promote the development of executive functioning, less ideal circumstances can undermine its development. Children with parents who are high in control, intrusive, or detached tend to show less advanced executive functioning abilities (Valcan et al., 2018). Environmental circumstances may interact with individual characteristics as well. For example, although poverty is associated with poor executive control (St. John et al., 2018), children low in temperament reactivity do not show impaired functioning, whereas temperamentally reactive children do (Raver et al., 2013).

Illustrating the plasticity of the brain, children—particularly those with poor executive control—benefit from training. A wide variety of techniques have been successfully used, including computerized training, physical activity such as martial arts or yoga, and mindfulness (meditation) training (Diamond & Lee, 2011).

## SELECTIVE ATTENTION

School-age children can concentrate longer than younger children and can focus on the information they need and want while screening out irrelevant information. For example, in school, it may be necessary for a child to focus on a teacher's less-than-exciting lesson while simultaneously ignoring the antics of the class clown. This growth in selective attention—the ability to deliberately direct one's attention and shut out distractions—may hinge on the executive skill of inhibitory control, the voluntary suppression of unwanted responses (Luna et al., 2004).

The increasing capacity for selective attention is believed to be due to neurological maturation and is one of the reasons memory improves during middle childhood (Sanders et al., 2006). Older children make fewer mistakes in recall than younger children because they are better able to expect and predict what might be important to remember, to then select and attend to the appropriate stimulus when presented with it, and, when asked, to recall the relevant information from memory while ignoring irrelevant information (Gazzaley & Nobre, 2012).

## WORKING MEMORY

Working memory involves the short-term storage of information that is being actively processed, like a mental workspace. For example, if you are asked to compute what  $42 \times 60$  is, you would use your working memory to hold part of the answer while you solved the rest of it.

The efficiency of working memory increases greatly in middle childhood, laying the foundation for a wide range of cognitive skills. For example, between the ages of 6 and 10, there are improvements in processing speed (how quickly information is processed) and storage capacity (how many things can be simultaneously held in working memory) (Bayliss et al., 2005). The changes are reflected in brain development. As children become more proficient in working memory tasks, they shift from the use of generalized networks recruited with a heavy reliance on the corpus callosum to an increasingly adultlike specialized recruitment of devoted memory circuits (Bathelt et al., 2018). Part of this is due, as with executive control, to development of frontoparietal and frontostriatal circuits (Darki & Klingberg, 2015).

The capacity of a child's working memory is associated with academic achievement in a bidirectional fashion (Peng & Kievit, 2020). Working memory allows children to call up and mentally manipulate required information from long-term memory systems when solving a problem, such as when a child might recall the correct order of operations while completing a math problem. A child with a more efficient and effective working memory is able to do this more easily. At the same time, as children learn more, they have more information to use within working memory. So, for example, a child with a rich vocabulary might be better able to puzzle through the meaning of a complex sentence with multiple dependent clauses because less cognitive effort would be needed to think about vocabulary meaning and more could be spent on holding the unfinished clauses in memory until the end of the sentence.

Research has indicated that as many as 10 percent of school-age children suffer from poor working memory (Alloway et al., 2009). Training programs can improve working memory capacity, and indeed training programs have been shown to be associated with changes in brain activity in frontal and parietal cortices and basal ganglia, and increased dopamine receptor density (Klingberg, 2010). Thus far, such training effects tend to be absent or short-lived or do not transfer to areas other than the specific form of working memory addressed (Melby-Lervåg & Hulme, 2013; Rowe et al., 2019). Some researchers have even suggested results are poor enough such that future working memory interventions should be halted (Sala & Gobet, 2020). However, more research is needed in this area.

## MNEMONICS

Were you ever taught the saying “please excuse my dear Aunt Sally” as a technique to help you remember the order of operations in solving an equation? This is an example of a **mnemonic device**, a strategy to aid memory.

Common memory strategies are rehearsal, organization, and elaboration. Writing down a telephone number, making a list, setting a timer, and putting a library book by the front door are examples of **external memory aids**: prompts by something outside the person. Saying a telephone number over and over after looking it up, so as not to forget it before dialing, is a form of **rehearsal**, or conscious repetition. **Organization** is mentally placing information into categories (such as animals, furniture, vehicles, and clothing) to make it easier to recall. In **elaboration**, children associate items with something else, such as an imagined scene or story. To remember to buy lemons, ketchup, and napkins, for example, a child might visualize a ketchup bottle balanced on a lemon, with a pile of napkins handy to wipe up any spills.

There are developmental changes in children’s ability to use these memory strategies. For example, many children say words out loud when they are trying to remember them, and this simple rehearsal strategy does appear to help them remember material more effectively (Icht & Mama, 2015). However, they do not often spontaneously use other mnemonic aids. As children grow older, they develop better strategies, use them more effectively (Bjorklund, 1997; Karably & Zabrocky, 2017), and are better at assessing if they are reaching their memory goals (Schneider, 2008). Older children also often use more than one strategy for a task and choose different kinds of strategies for different problems (Bjorklund et al., 1997).

## METAMEMORY

**Metamemory** can be described as the knowledge of and reflection about memory processes. From kindergarten through the elementary school years, children advance steadily in understanding memory (Schneider, 2008).

Kindergarteners and first graders know that people remember better if they study longer, that people forget things with time, and that relearning something

### **mnemonic device**

Strategy to aid memory.

### **external memory aids**

Mnemonic strategies using something outside the person.

### **rehearsal**

Mnemonic strategy to keep an item in working memory through conscious repetition.

### **organization**

(1) Piaget’s term for the creation of categories or systems of knowledge. (2) Mnemonic strategy of categorizing material to be remembered.

### **elaboration**

Mnemonic strategy of making mental associations involving items to be remembered.

### **metamemory**

Understanding of processes of memory.



*Contestants in a spelling bee make good use of mnemonic strategies—devices to aid memory—such as rehearsal (repetition), organization, and elaboration.*

Chuck Myers/MCT/Alamy Stock Photo

- Identify four ways in which information processing improves during middle childhood?
- Explain the importance of executive function, selective attention, working memory, and metamemory?
- Name four common mnemonic aids and discuss developmental differences in their use?
- Give examples of how improved information processing explains cognitive advances Piaget described?

**Wechsler Preschool and Primary Scale of Intelligence, Revised (WPPSI-IV)**

Individual intelligence test for children, which yields verbal and performance scores as well as a combined score.

**Stanford-Binet Intelligence Scales**

Individual intelligence tests for ages 2 and up used to measure fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory.

**Otis-Lennon School Ability Test (OLSAT8)**

Group intelligence test for kindergarten through 12th grade.



*The Kaufman Assessment Battery for Children (K-ABC-II) is designed to evaluate cognitive abilities in children with diverse needs, such as hearing impairments and language disorders.*

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is easier than learning it for the first time (Flavell et al., 2002). However, younger children tend to overestimate their memory capacity (Karably & Zabrusky, 2017). It is not until third grade that children realize that some people remember better than others and that some things are easier to remember than others (Flavell et al., 2002), and they become more proficient in their use of memory strategies (Karably & Zabrusky, 2017). Children's metamemory abilities continue to progress through adolescence and quite possibly longer (van der Stel & Veenman, 2014).

Metacognition (thinking about thinking) is related to academic performance because it allows learners to reflect upon the strategies they are using and select those that are most effective (Vrugt & Oort, 2008). Metamemory may allow learners to calibrate whether or not the subjective assessment of the accuracy of responses (does it "feel right") aligns with reality by monitoring failures. This ability is supported by cortical thinning in the anterior insula and an increase in the thickness of the ventromedial prefrontal cortex from childhood through adolescence (Fandakova et al., 2017).

## Psychometric Approach: Intelligence

In this section, we discuss how intelligence (IQ) has been measured, its relationship to IQ, and some of the important influences on intelligence.

### MEASURING INTELLIGENCE

The most widely used individual test is the **Wechsler Intelligence Scale for Children (WISC-IV)**. The test for ages 6 through 16 measures verbal and performance abilities, yielding separate scores for each as well as a total score. The separate subtest scores pinpoint a child's strengths and help diagnose specific problems. For example, if a child does well on verbal tests (such as general information) but poorly on performance tests (such as drawing the missing part of a picture), the child may be slow in perceptual or motor development.

Another commonly used individual test is the **Stanford-Binet Intelligence Scale**. The Stanford-Binet measures both verbal and nonverbal abilities and consists of five subtests: fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory (Becker, 2003).

A popular group test, the **Otis-Lennon School Ability Test (OLSAT8)**, has levels for kindergarten through 12th grade. Children are asked to classify items, show an understanding of verbal and numerical concepts, display general information, and follow directions. Separate scores for verbal comprehension, verbal reasoning, pictorial reasoning, figural reasoning, and quantitative reasoning can identify specific strengths and weaknesses.

Some other diagnostic and predictive tools are based on neurological research and information-processing theory. The second edition of the **Kaufman Assessment Battery for Children (K-ABC-II)** (Singer et al., 2012), an individual test for ages 3 to 18, is designed to evaluate cognitive abilities in children with diverse needs (such as autism, hearing impairments, and language disorders) and from varying cultural and linguistic backgrounds.

**Dynamic tests** based on Vygotsky's theories focus on the child's zone of proximal development (ZPD): the difference between the items a child can answer alone and the items the child can answer with help. Thus, dynamic tests contain items up to 2 years above a child's current level of competence. Examiners help the child when necessary by asking leading questions, giving examples or demonstrations, and offering feedback (Resing, 2013).

## THE IQ CONTROVERSY

The use of psychometric intelligence tests such as those just described is controversial. On the positive side, because IQ tests have been standardized and widely used, there is extensive information about their norms, validity, and reliability. Cross-culturally, scores on IQ tests are good predictors of school achievement (Lynn et al., 2007). Childhood IQ is also predictive of a host of health outcomes, including general health, the risk of late-onset dementia, and chronic health conditions such as diabetes and cardiovascular disease (Deary et al., 2010; Wraw et al., 2015; Dobson et al., 2017).

On the other hand, critics claim that the tests underestimate the intelligence of children who are in ill health or, for one reason or another, do not do well on tests (Sternberg, 2004). Because the tests are timed, they equate intelligence with speed and penalize a child who works slowly and deliberately. Their appropriateness for diagnosing learning disabilities also has been questioned (Benson, 2003). Moreover, such variables as working memory (Alloway & Alloway, 2010), self-control (Duckworth et al., 2012), and even overall happiness (Bücker et al., 2018) have been found to be important in predicting academic achievement.

A more fundamental criticism is that IQ tests do not directly measure native ability; instead, they infer intelligence from what children already know. Further, the tests are validated against measures of achievement, such as school performance, which are affected by such factors as schooling and culture. There is also controversy over whether intelligence is a single, general ability or whether there are types of intelligence not captured by IQ tests. For these and other reasons, strong disagreement exists over how accurately these tests assess children's intelligence.

## INFLUENCES ON INTELLIGENCE

Both heredity and environment influence intelligence. Keeping in mind the controversy over whether IQ tests actually measure intelligence, let's look more closely at these influences.

**Brain Development** Intelligence is highly heritable (Polderman et al., 2015). There are likely thousands of genes that, additively, help determine the parameters of intelligence for an individual. These genetic influences interact with the environment over the course of a lifetime in complex ways, exerting their effects more strongly with age (Plomin & Von Stumm, 2018).

Research has found a relationship between intelligence and genes that regulate brain development (Sniekers et al., 2017). Overall brain volume is heritable as well as being associated with intelligence (Jansen et al., 2020). Myelination and neurogenesis (the formation of new neurons) (Hill et al., 2018), cortical thickness (Schmitt et al., 2019), and the development of neurons in the somatosensory cortex, hippocampus, and mid-brain (Coleman et al., 2019) have also been shown to be influenced by genes associated with intelligence.

The developmental changes found in cortical thickness are also strongly influenced by genes (Fjell et al., 2015). Intelligence is highest in those children whose cortex thins most quickly (Schnack et al., 2014) or whose white matter develops most rapidly (Tamnes et al., 2010). Moreover, while IQ is generally a stable trait, there are sometimes fluctuations. Research has shown that children and adolescents who show declines in IQ over time also show reductions in cortical thickness, suggesting a neural substrate for their declines in intellectual performance (Burgaleta et al., 2014).

Although reasoning, problem solving, and executive function are linked to the prefrontal cortex, other brain regions under strong genetic influence also contribute to intelligent behavior (Davis et al., 2009), as does the speed and reliability of transmission of messages in the brain. The efficiency and integration of brain processes, both at the global and specific level, are associated with intellectual functioning (Kim et al., 2016).

### Kaufman Assessment Battery for Children (K-ABC-II)

Nontraditional individual intelligence test designed to provide fair assessments of minority children and children with disabilities.

### dynamic tests

Tests based on Vygotsky's theory that emphasize potential rather than past learning.

### checkpoint can you . . .

- Name and describe two traditional intelligence tests for schoolchildren?
- Give arguments for and against IQ tests?



Asian American children often do well in school. As with other academic differences found across racial and ethnic groups, the reasons seem to be cultural, not genetic.

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**Influence of Schooling on IQ** Schooling increases tested intelligence (Adey et al., 2007). IQ scores drop during summer vacation and rise again during the academic year (Ceci & Williams, 1997; Huttenlocher et al., 1998). Additionally, scores attained on various educational assessment tests—which test knowledge, such as math and science, unlikely to be learned outside of an educational environment—are strongly correlated with IQ, and this relationship exists in all countries for which data are available (Lynn & Meisenberg, 2010; Lynn & Vanhanen, 2012). A recent meta-analysis suggests the effect of education on intelligence ranges from 1 to 5 IQ points per year of schooling (Ritchie & Tucker-Drob, 2018).

However, the cognitive gains associated with schooling do not appear to be general in nature and instead consist of direct gains in specific cognitive skills that are then tapped by IQ tests (Ritchie et al., 2015). Not surprisingly, the type of schooling also matters. Children who are enrolled in schools with an academic focus tend to show greater gains in intellectual performance than children in schools with a vocational focus (Becker et al., 2012). Last, there are differential effects on children. Children with the lowest intelligence derive the greatest benefits from schooling (Hegelund et al., 2020).

**Influences of Race/Ethnicity on IQ** Historically, Black children scored about 15 points lower than White children and showed a comparable lag on school achievement tests (Neisser et al., 1996). However, these gaps have narrowed by as much as 4 to 7 points (Dickens & Flynn, 2006). Average IQ scores of Hispanic American children fall between those of Black and White children (Ang et al., 2010). Projections for both African Americans and Hispanics are that the IQ gaps will fall even further in the coming decades (Rindermann & Pichelmann, 2015).

What accounts for racial/ethnic differences in IQ? Some researchers have argued for a substantial genetic factor (Herrnstein & Murray, 1994; Jensen, 1969). Although there is strong evidence of a genetic influence on individual differences in intelligence, there is no direct evidence that IQ differences among ethnic, cultural, or racial groups are hereditary (Gray & Thompson, 2004; Neisser et al., 1996; Sternberg et al., 2005). Instead, many studies attribute ethnic differences in IQ to inequalities in environment (Nisbett et al., 2012; Colman, 2016)—in income, nutrition, living conditions, health, parenting practices, early child care, intellectual stimulation, schooling, culture, or other circumstances such as the effects of oppression and discrimination that can affect self-esteem, motivation, and academic performance.

What about Asian Americans, whose scholastic achievements consistently top those of other ethnic groups? Asian American children's strong scholastic achievement seems to be best explained by their culture's emphasis on obedience and respect for elders, the importance Asian American parents place on education as a route to upward mobility, and the devotion of Asian American students to homework and study (Nisbett et al., 2012).

## checkpoint can you... ...

- Assess the effects of brain development on intellectual functioning?
- Assess the effects of schooling, race/ethnicity, and culture on IQ?

### theory of multiple intelligences

Gardner's theory that each person has several distinct forms of intelligence.

## IS THERE MORE THAN ONE INTELLIGENCE?

A serious criticism of IQ tests is that they focus almost entirely on abilities that are useful in school. Most IQ tests do not cover other important aspects of intelligent behavior, such as common sense, social skills, creative insight, and self-knowledge.

**Gardner's Theory of Multiple Intelligences** Is a child who is good at analyzing paragraphs and making analogies more intelligent than one who can play a challenging violin solo or pitch a curve ball at the right time? The answer is no, according to Gardner's (1993, 1998) **theory of multiple intelligences**.

# Window on the world

## CULTURAL CONCEPTIONS OF INTELLIGENCE

In most Western cultures, conceptions of intelligence tend to focus on being able to reason logically and analyze problems, and having a wide base of knowledge. However, this view is not held everywhere.

A variety of cultures consider intelligence to include not just intellectual capabilities but also the ability to get along with other people. For example, the Luo of rural Kenya believe part of being intelligent involves social-emotional competence (Grigorenko et al., 2001). Similarly, in many Asian cultures, intelligence is associated with being educated but also with being able to successfully maintain harmonious social relationships (Cocodia, 2014).

Many cultures also include a sense of social responsibility as a component of intelligence. The Mexican concept of *educado* includes respect for others and a strong sense of morality. Similarly, rural Zambians and the Baole of the Ivory Coast consider intelligence to include a sense of citizenship and cooperation. Behavior that is performed for selfish reasons is not viewed as intelligent (Rogoff, 2003).

Most intelligence tests in Western countries are timed. The implication drawn from this is that intelligence therefore must include the ability to complete

tasks rapidly. However, this view is not shared by all cultures. Ugandan villagers associate words such as *slow* and *careful* with intelligence (Wober, 1971). Similarly, among the Navajo, completing a task in a deliberate and unhurried manner is valued by adults (Ellis & Siegler, 1997).

Test developers have tried to design **culture-free tests**—tests with no culture-linked content by posing tasks that do not require language, such as tracing mazes, putting the right shapes in the right holes, and completing pictures—but they have been unable to eliminate all cultural influences. Test designers also have found it virtually impossible to produce **culture-fair tests** consisting only of experiences common to people in various cultures. Psychologists continue to work on constructing suitable tests and on interpreting the meanings of findings on intelligence.



Do you think intelligence will be defined the same way 100 years in the future? Is there anything about intelligence that is always the same across time and place?

According to Gardner, conventional intelligence tests tap only three “intelligences”: linguistic, logical-mathematical, and, to some extent, spatial. The other five, which are not reflected in IQ scores, are musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist (Table 3 gives definitions of each intelligence and examples of fields in which it is most useful). In addition, while its inclusion has elicited some criticism, Gardner later proposed a ninth intelligence, that of existential intelligence, akin to spiritual or religious intelligence.

Gardner argued that these intelligences are distinct from each other and that high intelligence in one area does not necessarily accompany high intelligence in any of the others. A person may be extremely gifted in art (a spatial ability), precision of movement (bodily-kinesthetic), social relations (interpersonal), or self-understanding (intrapersonal), but not have a high IQ. Thus an athlete, an artist, and a musician could be equally intelligent, each in a different area.

Gardner (1995) would assess each intelligence directly by observing its products—how well a child can tell a story, remember a melody, or get around in a strange area—and not with typical standardized tests. The type of intelligence being assessed would determine the type of test required.

Critics of Gardner argue that his multiple intelligences are actually more accurately labeled as talents or abilities and assert that intelligence is more closely associated with skills that lead to academic achievement. They further question his criteria for defining separate intelligences that largely overlap, such as mathematical and spatial intelligence (Willingham, 2004).

### culture-free tests

Intelligence tests that, if they were possible to design, would have no culturally linked content.

### culture-fair tests

Intelligence tests that deal with experiences common to various cultures, in an attempt to avoid cultural bias.



Approximately 65 percent of Americans believe themselves to be smarter than the average person—a mathematical impossibility. Moreover, the least intelligent people are the ones most confident in their intelligence (Heck et al., 2018).

**TABLE 3** Eight Intelligences, According to Gardner

Intelligence	Definition	Fields or Occupations Where Used
<b>Linguistic</b>	Ability to use and understand words and nuances of meaning	Writing, editing, translating
<b>Logical-mathematical</b>	Ability to manipulate numbers and solve logical problems	Science, business, medicine
<b>Spatial</b>	Ability to find one's way around in an environment and judge relationships between objects in space	Architecture, carpentry, city planning
<b>Musical</b>	Ability to perceive and create patterns of pitch and rhythm	Musical composition, conducting
<b>Bodily-kinesthetic</b>	Ability to move with precision	Dancing, athletics, surgery
<b>Interpersonal</b>	Ability to understand and communicate with others	Teaching, acting, politics
<b>Intrapersonal</b>	Ability to understand the self	Counseling, psychiatry, spiritual leadership
<b>Naturalist</b>	Ability to distinguish species and their characteristics	Hunting, fishing, farming, gardening, cooking

Source: Based on Gardner (1993, 1998).

#### triarchic theory of intelligence

Sternberg's theory describing three elements of intelligence: componential, experiential, and contextual.

#### componential element

Sternberg's term for the analytic aspect of intelligence.

#### experiential element

Sternberg's term for the insightful or creative aspect of intelligence.

#### contextual element

Sternberg's term for the practical aspect of intelligence.

#### tacit knowledge

Sternberg's term for information that is not formally taught but is necessary to get ahead.

**Sternberg's Triarchic Theory of Intelligence** Sternberg's (1985, 2004) **triarchic theory of intelligence** identifies three elements, or aspects, of intelligence: componential, experiential, and contextual

- The **componential element** is the analytic aspect of intelligence; it determines how efficiently people process information. It helps people solve problems, monitor solutions, and evaluate the results. Some people are more effective information processors than others.
- The **experiential element** is insightful or creative; it determines how people approach novel or familiar tasks. It enables people to compare new information with what they already know and to come up with new ways of putting facts together—in other words, to think originally.
- The **contextual element** is practical; it helps people deal with their environment. It is the ability to size up a situation and decide what to do. What actions are most appropriate for a given situation depend on the context; a person might decide to adapt to a situation, change it, or get out of it.

The Sternberg Triarchic Abilities Test (STAT) (Sternberg, 1993) seeks to measure each of the three aspects of intelligence through multiple-choice and essay questions. Because Sternberg focused on processes rather than content and those processes should predict intelligent behavior across domains of knowledge, three domains of intelligence are assessed: verbal, quantitative, and figural (or spatial). For example, an item to test practical quantitative intelligence might be to solve an everyday math problem having to do with buying tickets to a ball game or following a recipe for making cookies. A creative verbal item might ask children to solve deductive reasoning problems that start with factually false premises (such as "Money falls off trees"). An analytical figural item might ask children to identify the missing piece of a figure. As predicted, the three kinds of abilities are only weakly correlated with each other (Sternberg, 1997; Sternberg & Clinkenbeard, 1995). However, validation studies have found a positive correlation between the STAT and several other tests of critical thinking, creativity, and practical problem solving. Additionally, total STAT scores predict academic achievement (Sternberg et al., 2001; Ekinci, 2014).

In the real world, book knowledge may not always be helpful. For example, children in many cultures have to learn practical skills, known as **tacit knowledge**, in order to

succeed. In studies in Usenge, Kenya, and among Yup'ik Eskimo children in southwestern Alaska, children's tacit knowledge of medicinal herbs, hunting, fishing, and preserving plants showed no correlation with conventional measures of intelligence but were necessary for survival (Grigorenko et al., 2004; Sternberg, 2004).

## checkpoint can you . . .

- Compare Sternberg's and Gardner's theories of intelligence?

# Language and Literacy

Language abilities continue to grow during middle childhood. Areas of particular importance during this age stage are vocabulary, grammar, syntax, pragmatics, and literacy.

## VOCABULARY, GRAMMAR, AND SYNTAX

As vocabulary grows during the school years, children use increasingly precise verbs. They learn that a word such as *run* can have more than one meaning, and they can tell from the context which meaning is intended. Simile and metaphor, figures of speech in which a word or phrase that usually designates one thing is compared or applied to another, become increasingly common. Although grammar is quite complex by age 6, children during the early school years rarely use the passive voice (as in "The sidewalk is being shoveled") (Owens, 1996).

Children's understanding of rules of syntax (the deep underlying structure of language that organizes words into understandable phrases and sentences) becomes more sophisticated with age (Chomsky, 1969). For example, most children under age 5 or 6 think the sentences "John promised Bill to go shopping" and "John told Bill to go shopping" both mean that Bill is the one to go to the store. By age 8, most children can interpret the first sentence correctly, and by age 9, virtually all children can. They now look at the meaning of a sentence as a whole instead of focusing on word order alone.

Sentence structure continues to become more elaborate. Older children use more subordinate clauses ("The boy who delivers the newspapers rang the doorbell."). Still, some constructions, such as clauses beginning with *however* and *although*, do not become common until early adolescence (Owens, 1996).



Learning a language requires approximately 1.5 megabytes of data (Mollica & Piantadosi, 2019).

## PRAGMATICS

The major area of linguistic growth during the school years is in **pragmatics**: the social context of language. Pragmatics includes both conversational and narrative skills.

There are wide individual differences in such skills; some 7-year-olds are better conversationalists than some adults (Anderson et al., 1994). Children who have a larger vocabulary and produce more sophisticated grammar are more likely to be better at pragmatics. Theory of mind development is likewise associated with pragmatic skills, although to a lesser extent (Matthews et al., 2018). There are also gender differences. Boys tend to use more controlling statements, negative interruptions, and competitive statements, whereas girls phrase their remarks in a more tentative, conciliatory way and are more polite and cooperative (Leman et al., 2005; Cook-Gumperz & Syzmanski, 2001).

Children also improve at telling stories. Most 6-year-olds can retell the plot of a short book, movie, or television show. They are beginning to describe motives and causal links. By second grade, children's stories become longer and more complex. Fictional tales often have conventional beginnings and endings ("Once upon a time . . ." and "They lived happily ever after"). Word use is more varied than before, but characters do not show growth or change, and plots are not fully developed.

Older children usually set the stage with introductory information about the setting and characters, and they clearly indicate changes of time and place during the story. They construct more complex episodes than younger children do but with less unnecessary detail. They focus more on the characters' motives and thoughts, and they think through how to resolve problems in the plot.

### pragmatics

(1) The practical knowledge needed to use language for communicative purposes. (2) The social context of language.



If you want children to tell you the truth, ask them to promise to do so before asking your question. Researchers have found that children are less likely to lie after promising to tell the truth (Evans & Lee, 2010).

## checkpoint can you . . .

- Summarize improvements in language skills during middle childhood?

#### **English-immersion approach**

Approach to teaching English as a second language in which instruction is presented only in English.

#### **bilingual education**

System of teaching non-English-speaking children in their native language while they learn English and later switching to all-English instruction.

#### **bilingual**

Fluent in two languages.

#### **two-way (dual-language) learning**

Approach to second-language education in which English speakers and non-English-speakers learn together in their own and each other's languages.

## **SECOND-LANGUAGE LEARNING**

In 2019, 23 percent of US children ages 5 to 17 spoke a language other than English at home. The primary language most of these children spoke was Spanish, and 4 percent had difficulty speaking English (Federal Interagency Forum on Child and Family Statistics, 2021). About 9.4 percent of the public school population are defined as English-language learners (ELLs) (NCES, 2017).

Some schools use an **English-immersion approach** (sometimes called ESL, or English as a second language) in which language-minority children are immersed in English from the beginning in special classes. Other schools have adopted programs of **bilingual education**, in which children are taught in two languages, first learning in their native language and then switching to regular classes in English when they become more proficient. These programs can encourage children to become **bilingual** (fluent in two languages) and to feel pride in their cultural identity.

Advocates of early English immersion claim that the sooner children are exposed to English, the better they learn it. Proponents of bilingual programs claim that children progress faster academically in their native language and later make a smoother transition to all-English classrooms (Padilla et al., 1991). Statistical analyses of multiple studies conclude that children in bilingual programs typically outperform those in all-English programs on tests of English proficiency (Crawford, 2007; Krashen & McField, 2005).

Another, less common approach is **two-way (dual-language) learning**, in which English-speaking and foreign-speaking children learn together in their own and each other's languages. By valuing both languages equally, it reinforces self-esteem and improves school performance. However, less than 2 percent of English-language learners nationwide are enrolled in two-way programs (Crawford, 2007).

## **checkpoint** can you...

- Describe and evaluate three types of second-language education?

## **LITERACY**

Today, the global literacy rate is approximately 86 percent, and 750 million people worldwide are illiterate. Two-thirds of the illiterate population are women. Almost half (49 percent) of the illiterate population is in southern Asia, followed by sub-Saharan Africa (27 percent). Age makes a difference too. Children and adolescents are less likely to be illiterate than adults (UNESCO Institute for Statistics, 2017).

#### **Learning to Read and Write**

Think of what happens in order for a child to learn to read words. First, a child must remember the distinctive features of letters; for example, that a “c” consists of a curved half-circle and an “o” is a closed circle. Then a child must be able to recognize the different phonemes by breaking down words into their constituent parts. For example, a child must be able to understand that the word *dog* is composed of three different sounds, the “d,” the “o,” and the “g.” Finally, the child must be able to match the visual features of letters and the phonemes and remember which ones go together. This process is known as **decoding**.

In the traditional approach to literacy, called the **phonetic (code-emphasis) approach**, the child sounds out the word, translating it from print to speech before retrieving it from long-term memory. To do this, the child must master the phonetic code that matches the printed alphabet to spoken sounds (as described in the previous paragraph). Instruction generally involves rigorous, teacher-directed tasks focused on memorizing sound-letter correspondences.

The **whole-language approach** emphasizes visual retrieval and the use of contextual cues. This approach is based on the belief that children can learn to read and write naturally, much as they learn to understand and use speech. By using **visually based retrieval**, the child simply looks at the word and then retrieves it. Whole-language proponents assert that children learn to read with better comprehension and more enjoyment if they experience written language from the outset as a way to gain information and express ideas and feelings, not as a system of isolated sounds and syllables to be learned by memorization and drill.

#### **decoding**

Process of phonetic analysis by which a printed word is converted to spoken form before retrieval from long-term memory.

#### **phonetic (code-emphasis) approach**

Approach to teaching reading that emphasizes decoding of unfamiliar words.

#### **whole-language approach**

Approach to teaching reading that emphasizes visual retrieval and use of contextual clues.

#### **visually based retrieval**

Process of retrieving the sound of a printed word when seeing the word as a whole.

Despite the popularity of the whole-language approach, research has found little support for its claims. Although humans have brains wired for spoken language, there is no theoretical reason to assume that written language, a relatively new invention in human history, has similar evolutionary roots and thus should be learned as naturally as spoken language. A long line of research supports the view that phonemic awareness and early phonetics training are keys to reading proficiency for most children (Brady, 2011).

Many experts recommend a blend of the best features of both approaches (National Reading Panel, 2000). Children can learn phonetic skills along with strategies to help them understand what they read. For example, they might be drilled in sound-letter correspondences but also be asked to memorize certain common words such as *the* and *one* that are more difficult to decode. Children who can summon both visually based and phonetic strategies become better, more versatile, readers (Siegler, 1998, 2000).

Writing is difficult for young children. Unlike conversation, which offers constant feedback, writing requires the child to judge independently whether the communicative goal has been met. The child also must keep in mind a variety of other constraints: spelling, punctuation, grammar, and capitalization, as well as the basic physical task of forming letters (Siegler, 1998).

Older preschoolers begin using letters, numbers, and letterlike shapes as symbols to represent words or parts of words (syllables or phonemes). Often their spelling is quite inventive—so much so that they may not be able to read it themselves (Ouellette & Sénechal, 2008). Typically, children's spelling improves as they become better readers, and this is associated with phonological awareness (Ritchey, 2008).

## checkpoint can you . . .

- ▶ Compare the phonetic and whole-language methods of teaching reading, and discuss how comprehension improves?
- ▶ Identify factors that affect reading improvement in poor beginning readers?
- ▶ Explain why writing is hard for young children?

# The Child in School

First grade marks entry into “real school.” It is a milestone in academic development and sets the stage for future success or failure.

## INFLUENCES ON SCHOOL ACHIEVEMENT

In the following sections, we address influences on school achievement. We also address wider systemic issues related to educational reform, class size, alternative educational models, the use of computers in the classroom, and the effects of the COVID-19 pandemic.

**Self-Efficacy Beliefs** Think of how you felt the last time you studied for a big exam. Did you feel you could do well as long as you studied, and were you confident in your ability to master the material? Or did you feel that nothing you could do would matter and that the material was just too hard? Your attitude can be described as involving a construct called self-efficacy. Those students high in self-efficacy believe they can master schoolwork and regulate their own learning (Komarraju & Nadler, 2013). They are more likely to succeed than students who do not believe in their abilities (Caprara et al., 2008), in part because high self-efficacy has a positive effect on motivation (Skaalvik et al., 2015). Self-regulated learners try hard, persist despite difficulties, and seek help when necessary. Moreover, doing well in school then results in increases in self-efficacy, which once again results in attitudes and behaviors likely to lead to academic success (Schöber et al., 2018). Unfortunately, the converse is also true. Students who do not believe in their ability to succeed tend to become frustrated and depressed—feelings that make success increasingly elusive over time.

**Gender** Girls tend to do better in school than boys. They receive higher marks, on average, in every subject (Voyer & Voyer, 2014; Halpern et al., 2007), are less likely to repeat grades, have fewer school problems (Freeman, 2004), outperform boys in reading and writing assessments



Did you take psychology because you thought it would be easy? You're not alone. By the age of 7, children believe that psychology is easier than the natural sciences (Keil et al., 2010).



Interest, attention, and active participation all contribute to a child's academic success in school.  
Andersen Ross/Blend Images/Getty Images



*Children who have a social network and who are liked and accepted by peers tend to do better in school.*

Stockbyte/Digital Vision/Getty Images

*Another influence:  
When teachers are  
enthusiastic about class  
material, children remember  
it better (Moe et al., 2021).*



(Scheiber et al., 2015), and tend to do better than boys on timed tests (Camarata & Woodcock, 2006). Some research has suggested that boys outperform girls on science and math (Reilly et al., 2015), but other research has not found a gender gap (Lindberg et al., 2010) or has found it varies by culture (Else-Quest et al., 2010).

Gender differences tend to become more prominent in high school. A combination of several factors, including early experience, biological differences, and cultural expectations, may help explain these differences (Nisbett et al., 2012; Halpern et al., 2007).

**Peer Acceptance** Children who are disliked by their peers tend to do poorly in school, a finding that exists for both boys and girls (Nakamoto & Schwartz, 2010; van Lier et al., 2012). This association is strongest earlier in childhood and exerts a stronger influence in Asian countries (Wentzel et al., 2021). It may be that the characteristics of some children, including aggression and oppositional behavior, lead to doing poorly in school and not being liked by peers. Then their academic underachievement and peer victimization lead to anxiety, depression, and further declines in academic performance (van Lier et al., 2012). For example, children low in emotional knowledge tend to be less liked than their peers and are also less likely to be successful academically (Voltmer & von Salisch, 2017). There is also some evidence that this effect is bidirectional; students who do poorly in school also seem to later show social difficulties (Caemmerer & Keith, 2015).

Early teacher identification of children who exhibit social problems could lead to interventions that would improve such children's academic as well as emotional and social outcomes (Flook et al., 2005). Additionally, teachers can serve as buffers against some of the effects of negative peer interactions, either by establishing a warm relationship with a rejected child or by promoting a classroom climate in which victimization of disliked children is discouraged and positive social identities are encouraged (Elledge et al., 2016; Serdiouk et al., 2015).

**Parenting Practices** Generally, regardless of how it is defined, parental involvement has a positive effect on academic achievement (Wilder, 2014; LaRocque et al., 2011). However, some forms of involvement appear to be more effective than others. For example, homework assistance has not been consistently related to academic achievement (Hill & Tyson, 2009; McNeal, 2012), perhaps because homework itself is minimally related to academic achievement (Bas et al., 2017). School involvement, including parental participation in school events and activities and good communication with teachers, is more strongly associated with strong academic performance (Overstreet et al., 2005; Topor et al., 2010). The strongest effects for parent involvement, however, center on parental expectations. Those parents who expect that their children will do well in school have children who live up to those beliefs (Boonk et al., 2018), perhaps because children also adopt the same attitude about their abilities (Topor et al., 2010).

**Socioeconomic Status** Socioeconomic status (SES) can be a powerful factor in educational achievement—not in and of itself but through its influence on family atmosphere, choice of neighborhood, parenting practices, and parents' expectations for children. Generally, achievement gaps between advantaged and disadvantaged students widen from kindergarten to third grade (Kena et al., 2014). Summer vacation contributes to these gaps because of differences in the typical home environment and in the summer learning experiences the children have, particularly with respect to reading (Johnston et al., 2015). Moreover, as the income gap between wealthy and poor families has gotten larger, the achievement gap between wealthy and poor children has also grown (Reardon, 2011). Race, too, matters. In the last few decades, the achievement gap between poor White students and poor Black and Hispanic students has increased. However, the achievement gap between wealthier White and wealthier Black and Hispanic students has declined (Pashchall et al., 2018).

In addition to these factors, socioeconomic status may influence brain development itself. For example, children who live in poverty are more likely to be exposed to environmental toxins such as lead, which can negatively impact brain development. Poor children are also less likely to have access to healthy foods and more likely to suffer from nutrient deficiencies. Moreover, poverty is associated with higher stress, and high levels of chronic stress can have a direct negative effect on development as well as indirect effects on development via its impact on relational processes (Hackman et al., 2010; Blair & Raver, 2016). Research has demonstrated that children living in poverty have 3 to 4 percent less gray matter volume in their frontal lobe, temporal lobe, and hippocampus, a finding that has implications for academic functioning (Hair et al., 2015).

- Evaluate how efficacy beliefs, gender, parenting practices, SES, and peer acceptance affect school achievement?

**Educational Reform** The No Child Left Behind (NCLB) Act of 2001 was a sweeping educational reform designed to funnel federal funding to research-based programs and practices. Students in grades three through eight were tested annually to determine if they were meeting statewide progress objectives. NCLB was replaced in 2015 by the Every Student Succeeds Act (ESSA) with bipartisan support. ESSA retained the standardized testing requirements of NCLB but shifted the responsibility and accountability of oversight to the state governments.

What has been the influence of these regulatory systems? The pattern of improvements in achievement scores has been highly variable across states, grades, and subjects (Lee & Reeves, 2012). However, test scores do show improvement. In 2007, for example, math scores for fourth and eighth graders on the National Assessment of Educational Progress (NAEP) rose to their highest levels since the test began in 1990. Black, White, and Hispanic students all improved (NCES, 2007), but ethnic group gaps remain (Hernandez & Macartney, 2008). The gaps between high and low achievers have increased over time. For example, although the average math and science scores increased between 2009 and 2019, the increase was due to higher scores of already high-achieving students. The scores of low-achieving students either declined or did not change. This performance gap suggests increasing inequity across educational systems (National Center for Education Statistics, 2021).

**Class Size** The average class size varies widely across different countries. Average class sizes are larger in Chile (30.8 students), Japan (27.2 students), and the United Kingdom (26 students) and smaller in Costa Rica (15.7 students), Luxembourg (15.9 students), and Latvia (16.5). The average class size in the United States is 20.9 students (Organisation for Economic Co-Development and Learning, 2021).

The evidence on the importance of class size in educational achievement is mixed. Some researchers have not found evidence that reducing class size benefits academic performance (Chingos, 2012; Hoxby, 2000). Other research has shown that reducing class size has a beneficial effect on academic performance and results in improved test scores in reading, mathematics, and word recognition (Shin & Raudenbush, 2011). However, it has been argued that the effects are small and not likely to lead to sizable increases in student learning (Cho et al., 2012). Moreover, the effect of class size varies depending on cultural context. In some Asian countries, including China and Japan, classes are larger, yet students perform at a high level (Organisation for Economic Co-Operation and Learning, 2013).

However, many educators argue that smaller classes do benefit students. In smaller classes, students spend more time interacting with the teacher, are more likely to be the focus of a teacher's attention, and spend more time on-task and less time off-task (Blatchford et al., 2011; Folmer-Annevelink et al., 2010). Smaller class size has at times been associated with improved test scores on reading, mathematics, and word recognition (Shin & Raudenbush, 2011). Some data suggest that the students most at risk, including students of lower socioeconomic status or from marginalized or disenfranchised groups, benefit the most from small classrooms. Additionally, small class size seems to be most useful for younger children (Nandrup, 2016; Zyngier, 2014; Watson et al., 2013).

**Charter Schools and Homeschooling** More than 3.3 million children, or about 6.5 percent of public schools students, attend charter schools (White et al., 2021). Charter schools tend to be smaller than regular public schools and have a unique philosophy, curriculum, structure, or organizational style. Some studies have found achievement gains, especially in mathematics, for students enrolled in charter schools (Betts & Tang, 2016), some studies have found mixed results (Berends, 2015), and some studies have found negative results (Clark et al., 2015). Currently, not enough data are available for general recommendations to be made.

Homeschooling is legal in all 50 states. National homeschooling rates rose in the early 2000s and plateaued in 2012 at approximately 3.3 percent of the school-age population. However, during the COVID-19 pandemic, homeschooling rates expanded sharply. For example, in fall 2020, approximately 11.1 percent of households with children reported homeschooling (Eggleston & Fields, 2021). The main reasons parents give for choosing to homeschool their children is a poor or unsafe learning environment in the schools and the desire to provide religious or moral instruction (NCES, 2008). Most homeschooled students are White (89 percent), and most (about 90 percent) live above the poverty level (Redford et al., 2016).

Although advocates of homeschooling argue that homeschooling is associated with good academic outcomes (Christian Home Educators Association of California, 2013; Ray, 2010), the studies that have been conducted have serious methodological flaws and tend to come from a limited pool of researchers and organizations with potential biases (Kunzman & Gaither, 2020; Lubienski et al., 2013). Thus, the efficacy of homeschooling remains in question. Given the variety of methods and materials used (Redford et al., 2016), it is likely the quality of instruction varies widely.

**The Influence of COVID-19 on Education** In 2020, many countries instituted physical distancing protocols, including school closures, to slow the spread of COVID-19, resulting in the largest education disruption in history. As of March 2022, over 43 million children still faced continuing school disruptions, and in six countries, schools remained fully closed (UNESCO, 2022). In February 2021, the Centers for Disease Control and Prevention released revised guidelines and advised schools could be reopened safely (Centers for Disease Control and Prevention, 2021). However, many schools remained fully or partly closed through fall 2021. Although the long-term effects of these educational interruptions remain to be seen, school closures and distance learning are likely to exacerbate existing social and economic inequalities (Research in Action).

**Computer and Internet Use** In 1994, only 4 percent of classrooms had Internet access, compared with 97 percent in 2008 (Snyder et al., 2018). Moreover, 87 percent of teachers report using digital learning in their classroom several times a week (Education Superhighway, 2020).

The COVID-19 pandemic resulted in an unprecedented need for distance learning solutions. However, there are vast disparities in how many children have access to technology. For example, although over 97 percent of children in the Netherlands and Iceland have a computer at home, in other countries such as Mexico (44.3 percent), Colombia (41.6 percent), and Brazil (39.4 percent), access is constrained, especially for poor children (OECD, 2021).

In the United States, there is a 22-point gap in home computer access for children from higher- (95 percent) and lower-income (63 percent) households, although 97 percent of households overall have a mobile device in the home (Common Sense Media, 2020). This is troubling, given the importance of reliable internet access to remote schooling. Moreover, only 68 percent of teachers reported receiving training on how to use computers for instruction in the previous year (Garcia & Weiss, 2020). Overall, the pandemic is expected to exacerbate existing inequities in academic achievement for children of lower socioeconomic status.

## checkpoint can you...

- ▶ Discuss changes and innovations in educational philosophy and practice?

## checkpoint can you...

- ▶ Discuss how the COVID-19 pandemic affected children's education?

## COMPOUNDING DISADVANTAGE: EDUCATIONAL ACCESS IN THE AGE OF COVID-19

Historically disadvantaged students are those who have difficulty excelling in school due to circumstances beyond their control. Children from low-income, rural, or racial/ethnic minority backgrounds tend to have more difficulties in educational attainment due to economic, geographic, and social barriers (Legal Information Institute, 2021; National Institutes of Health, 2021). The COVID-19 pandemic resulted in an unheard of shutdown of US schools and a massive shift to online learning within a few weeks. The move to teaching online has had far-reaching effects that have widened the long-standing educational disparity between advantaged and disadvantaged students. How exactly has COVID-19 added to the burden disadvantaged students already face in society?

For starters, low-income students have less available spaces to do homework and less suitable electronic devices for online learning (Poletti & Raballo, 2021), making doing schoolwork from home difficult. Low-income students have also faced more food insecurity as a result of losing school-based free or reduced-price meals during school hours (Dunn et al., 2020).

Rural students also tend to lack broadband internet access (Graves et al., 2021) and are likelier to live farther away from public spaces with reliable internet service. Only 25 percent of rural students have access to reliable internet service, compared to 41 percent of urban students (UNICEF & International Telecommunications Union, 2020), which makes connecting to online learning platforms difficult.

Race plays a large role as well. Black and Hispanic children were among the least likely to have adequate computer access despite being enrolled in online school (Friedman et al., 2021). Black parents were also found to be overrepresented in “frontline” worker positions that required them to continue to work during pandemic lockdowns (Allen et al., 2020), making it harder to supervise their children’s online learning even if devices were available. COVID-19 school closures in 2020 seemed to have a collective effect on Black, indigenous, and/or students of color, who were about 3 to 5 months behind in their learning as a result, compared to White students, who were only 1 to 3 months behind (McKinsey & Company, 2021).

What effects will these disparities have on disadvantaged students moving forward? As educational attainment is an important predictor of long-term health, COVID-19 may lead to the accumulation of physical and mental health risk for disadvantaged students over time (Fraiman et al., 2021). Controlling COVID-19 is not only a public health issue, but clearly an issue of social equality as well (Kahambing, 2021).



What strategies would you use to increase learning among disadvantaged students? How will the shift to online learning change schooling once COVID-19 is more controlled?

## Educating Children with Special Needs

Public schools have a tremendous job educating children of varying abilities from all sorts of families and cultural backgrounds. They must also educate children with special needs: for example, those who have learning problems and those who are gifted, talented, or creative.

### CHILDREN WITH LEARNING PROBLEMS

Just as educators have become more sensitive to teaching children from varied cultural backgrounds, they also have sought to meet the needs of children with special educational needs.

#### intellectual disability

Significantly subnormal cognitive functioning. Also referred to as cognitive disability.

**Intellectual Disability** Intellectual disability is significantly subnormal cognitive functioning. It is indicated by an IQ of about 70 or less, coupled with a deficiency in age-appropriate adaptive behavior (such as communication, social skills, and self-care), appearing before age 18 (American Psychiatric Association, 2013). Intellectual disability is sometimes referred to as cognitive disability. Slightly over 1 percent of US children are intellectually disabled (Zablotsky et al., 2015). Worldwide, about 3.2 percent of children are intellectually disabled (Olusanya et al., 2020).

In 30 to 50 percent of cases, the cause of intellectual disability is unknown. Known causes include genetic disorders, traumatic accidents, prenatal exposure to infection or alcohol, and environmental exposure to lead or high levels of mercury (Woodruff et al., 2004). Many cases may be preventable through genetic counseling, prenatal care, amniocentesis, routine screening and health care for newborns, and nutritional services for pregnant women and infants.

Most children with intellectual disabilities can benefit from schooling. Intervention programs have helped many of those mildly or moderately disabled and those considered borderline (with IQs ranging from 70 up to about 85) to hold jobs, live in the community, and function in society. The profoundly disabled need constant care and supervision, usually in institutions. For some, day care centers, hostels for intellectually disabled adults, and homemaking services for caregivers can be less costly and more humane alternatives.

#### learning disabilities (LDs)

Disorders that interfere with specific aspects of learning and school achievement.

#### dyslexia

Developmental disorder in which reading achievement is substantially lower than predicted by IQ or age.

Children's patterns of brain activation change as they become better readers (Kearns et al., 2019), illustrating the flexible nature and plasticity of our brains.



**Learning Disabilities** Learning disabilities (LDs) interfere with specific aspects of school achievement, such as listening, speaking, reading, writing, or mathematics, resulting in performance substantially lower than would be expected given a child's age, intelligence, and amount of schooling. Estimates are that approximately 1 in 5 children has some form of learning or attentional issues impacting academic performance. In recent years, rather than waiting for children to fail and then providing services, it is more typical to provide early—and more effective—assistance to these children (National Center for Learning Disabilities, 2020).

Children with LDs often have near-average to higher-than-average intelligence and normal vision and hearing, but they have trouble processing sensory information. Causal influences include both genetic and environmental factors. Environmental factors include complications of pregnancy or birth, injuries after birth, trauma, and exposure to lead (National Center for Learning Disabilities, 2020).

**Dyslexia** is the most commonly diagnosed of the learning disabilities. Dyslexia is a chronic, persistent medical condition and tends to run in families. It hinders the development of oral as well as written language skills and may cause problems with writing, spelling, grammar, and understanding speech as well as with reading (National Center for Learning Disabilities, 2020). Reading disability is more frequent in boys than in girls (Arnett et al., 2017). Although reading and intelligence are related to each other in children without dyslexia, they are not coupled in this fashion for children with dyslexia. In other words, dyslexia is not an issue of intelligence (Ferrer et al., 2010).

Brain imaging studies have found that dyslexia is due to a neurological defect that disrupts recognition of speech sounds (Peterson & Pennington, 2012). Many children—and even adults—with dyslexia can be taught to read through systematic phonological training, but the process does not become automatic, as it does with most readers (Eden et al., 2004; Shaywitz, 2003).

#### attention-deficit/hyperactivity disorder (ADHD)

Syndrome characterized by persistent inattention and distractibility, impulsivity, low tolerance for frustration, and inappropriate overactivity.

**Attention-Deficit/Hyperactivity Disorder** Attention-deficit/hyperactivity disorder (ADHD) is a chronic condition usually marked by persistent inattention, distractibility, impulsivity, and low tolerance for frustration. ADHD affects an estimated 5 to 7.2 percent of school-age children worldwide (Smith, 2017). In 2016, about 6.1 million children in the United States had at some point been diagnosed with ADHD, a rate of about 9.4 percent (see Figure 3). Approximately 60 percent of children diagnosed with ADHD have at least one other mental, emotional, or behavioral disorder (Centers for Disease Control and Prevention, 2020).

Similar to LDs, ADHD diagnosis rates vary greatly by gender, ethnicity, geographic area, and other contextual factors. Boys (12.9 percent) are more likely than girls (5.6 percent) to have ADHD (Centers for Disease Control and Prevention, 2020). Prevalence rates are higher in non-Hispanic White (12 percent) and Black (12.8 percent) children than Hispanic (6.1 percent) children (Xu et al., 2018).

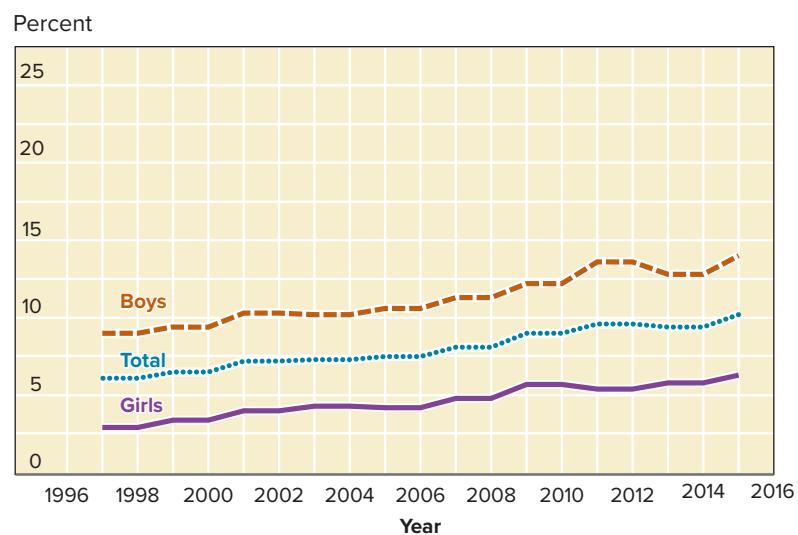
Imaging studies reveal that certain regions in the brains of children with ADHD—most notably areas in the frontal cortex—show delays in development. The motor cortex is the only area that matures faster than normal, and this mismatch may account for the restlessness and fidgeting characteristic of the disorder. During tasks that require the deployment of attentional processes, children with ADHD show reduced activation in frontoparietal and ventral attention networks areas (Cortese et al., 2012). These frontal regions enable a person to set goals, focus attention, monitor progress, and inhibit negative impulses—all functions disturbed in children with ADHD.

Ritalin is a commonly prescribed drug that is generally very effective for the management of ADHD. However, it is related to slower growth in height and weight (Powell et al., 2015). Interventions with children with ADHD are most useful if they include behavioral interventions, modification of teaching instructions and student tasks, good communication with parents, and collaboration among school professionals such as teachers and psychologists (DuPaul & Stoner, 2014).

## GIFTED CHILDREN

The traditional criterion of giftedness is high general intelligence as shown by an IQ score of 130 or higher. This definition tends to exclude highly creative children (whose unusual answers often lower their test scores), children from minority groups (whose abilities may not be well developed, though the potential is there), and children with specific aptitudes (who may be only average or even show learning problems in other areas). Thus, all 50 states have moved beyond a single-score definition of giftedness (McClain & Pfeiffer, 2012).

Most states and school districts have adopted a broader definition of giftedness. Generally, multiple criteria are used for admission to programs for the gifted, including achievement test scores, grades, classroom performance, creative production, parent and teacher nominations, and student interviews. An estimated 6 percent of the student population is considered gifted (National Association for Gifted Children, n.d.).



**FIGURE 3**

### US Diagnosis of Attention-Deficit/Hyperactivity Disorder by Year

*Diagnosis of learning disabilities has remained constant, but diagnosis of ADHD rose from 1997 to 2015.*

Source: Xu et al. (2018).

*Long-term effects of drug treatment for ADHD are unknown, but leaving the condition untreated also carries risks. If you had a child with ADHD, what would you do?*



### checkpoint can you ...

- Discuss the causes, treatments, and prognoses for three conditions that interfere with learning?



*Although most people think of special education programs as designed to benefit children with learning problems, gifted children also have needs different from the general student population.*

FatCamera/E+/Getty Images

#### **enrichment programs**

Programs for educating the gifted that broaden and deepen knowledge and skills through extra activities, projects, field trips, or mentoring.

#### **acceleration programs**

Programs for educating the gifted that move them through the curriculum at an unusually rapid pace.

#### **creativity**

Ability to see situations in a new way, to produce innovations, or to discern previously unidentified problems and find novel solutions.

#### **convergent thinking**

Thinking aimed at finding the one right answer to a problem.

#### **divergent thinking**

Thinking that produces a variety of fresh, diverse possibilities.

### **checkpoint** can you...

- Tell how gifted children are identified?
- Explain why creativity is hard to measure?
- Compare two approaches to the education of gifted children?

Programs for gifted children generally stress either enrichment or acceleration. **Enrichment programs** may deepen students' knowledge and skills through extra classroom activities, research projects, field trips, or expert coaching. **Acceleration programs** speed up their education through early school entrance, grade skipping, placement in fast-paced classes, or advanced courses. Other options include ability grouping within the classroom, which has been found to help children academically and not harm them socially (Vogl & Preckel, 2014), dual enrollment (for example, an eighth grader taking algebra at a nearby high school), magnet schools, and specialized schools for the gifted.

Gifted children tend to grow up in enriched family environments with intellectual or artistic stimulation. Their parents recognize and often devote themselves to nurturing the children's gifts and curiosity, and tend to give their children an unusual degree of independence and expose them to new experiences. Parents of gifted children typically have high expectations and are hard workers and high achievers themselves (Al-Dhamit & Kreishan, 2016; Garn et al., 2010; Gottfried et al., 2016).

#### **Defining and Measuring Creativity**

One definition of **creativity** is the ability to see things in a new light—to produce something never seen before or to discern problems others fail to recognize and find new and unusual solutions. High creativity and high academic intelligence (IQ) do not necessarily go hand in hand (Anastasi & Schaefer, 1971; Getzels & Jackson, 1963).

The reason creativity is not highly correlated with traditional IQ tests is because traditional tests are measuring a different kind of thinking than is characteristic of creativity. **Convergent thinking**—the kind

IQ tests measure—seeks a single correct answer. For example, when solving an arithmetic problem, there is one correct answer upon which everyone is expected to converge. **Divergent thinking**, by contrast, involves coming up with a wide array of fresh possibilities, such as when children are asked to list how many different uses there might be for a paper clip or to write down what a sound brings to mind (Guilford, 1956). There is no one right answer.

*One possible reason creativity and academic achievement don't always relate is that personality characteristics related to creativity—such as being nonconformist or emotional—are generally viewed negatively by teachers (Westby & Dawson, 1995).*



Tests of creativity call for divergent thinking. This ability can be assessed via the Torrance Tests of Creative Thinking (TTCT) (Torrance & Ball, 1984), one of the most widely known tests of creativity. While there has been controversy about the measurement qualities of the test, a 50-year follow-up showed that scores on the TTCT were related to personal achievement, and when IQ was also taken into account, scores were related to public achievement as well (Runco et al., 2010).

# summary and key terms

## PHYSICAL DEVELOPMENT

### Aspects of Physical Development

- Physical development is less rapid in middle childhood than in earlier years. Wide differences in height and weight exist.
- Proper dental care, nutrition, and sleep are essential for normal growth and health.
- Changes in brain structure and functioning support cognitive advances.
- Because of improved motor development, boys and girls in middle childhood can engage in a wide range of motor activities.
- Informal recess-time activities help develop physical and social skills. Boys' games tend to be more physical and girls' games more verbal.
- About 10 percent of schoolchildren's play, especially among boys, is rough-and-tumble play.
- Many children, mostly boys, engage in organized, competitive sports. A sound physical education program should aim at skill development and fitness for all children.

**rough-and-tumble play** (261)

### Physical Health

- Middle childhood is a relatively healthy period; most children are immunized against major illnesses, and the death rate is the lowest in the life span.
- Overweight, which is increasingly common among US children, entails multiple risks. It is influenced by genetic and environmental factors and is more easily prevented than treated. Many children do not get enough physical activity.
- Hypertension is becoming more common along with the rise in overweight.
- The rate of asthma is high, and it seems to be caused by a combination of genetic and environmental risk factors. Respiratory infections and other acute medical conditions are common at this age. Chronic conditions such as asthma are most prevalent among poor and minority children. Diabetes is one of the most common childhood chronic conditions.
- Accidents are the leading cause of death in middle childhood. Use of helmets and other protective devices and avoidance of dangerous sports can greatly reduce injuries.

**acute medical conditions** (265)

**chronic medical conditions** (265)

**asthma** (265)

**diabetes** (265)

**hypertension** (266)

## COGNITIVE DEVELOPMENT

### Piagetian Approach: Cognition

- A child from about age 7 to age 12 is in the stage of concrete operations. Children are less egocentric than before and are more proficient at tasks requiring logical reasoning, such as spatial thinking, understanding of causality, categorization, inductive and deductive reasoning, and conservation. However, their reasoning is largely limited to the here and now.
- Neurological development, culture, and schooling seem to contribute to the rate of development of Piagetian skills.

**concrete operations** (267)

**seriation** (268)

**transitive inference** (268)

**class inclusion** (269)

**inductive reasoning** (269)

**deductive reasoning** (269)

**horizontal décalage** (270)

### Information-Processing Approach: Planning, Attention, and Memory

- Executive skills, reaction time, processing speed, selective attention, metamemory, and use of mnemonic devices improve during the school years.

**executive function** (271)

**mnemonic device** (273)

**external memory aids** (273)

**rehearsal** (273)

**organization** (273)

**elaboration** (273)

**metamemory** (273)

## Psychometric Approach: Intelligence

- IQ tests are fairly good predictors of school success but may be unfair to some children.
- Differences in IQ among ethnic groups appear to result to a considerable degree from socioeconomic and other environmental differences.
- Schooling increases measured intelligence.
- Attempts to devise culture-free or culture-fair tests have been unsuccessful. Indeed, intelligence testing seems inextricably linked with culture.
- IQ tests tap only three of the intelligences in Howard Gardner's theory of multiple intelligences.
- According to Robert Sternberg's triarchic theory, IQ tests measure mainly the componential element of intelligence, not the experiential and contextual elements.
- Other directions in intelligence testing include the Kaufman Assessment Battery for Children (K-ABC-II) and dynamic tests based on Vygotsky's theory.

**Wechsler Intelligence Scale for Children (WISC-IV)** (274)

**Stanford-Binet Intelligence Scale** (274)

**Otis-Lennon School Ability Test (OLSAT 8)** (274)

**Kaufman Assessment Battery for Children (K-ABC-II)** (275)

**dynamic tests** (275)

**theory of multiple intelligences** (276)

**culture-free tests** (277)

**culture-fair tests** (277)

**triarchic theory of intelligence** (278)

**componential element** (278)

**experiential element** (278)

**contextual element** (278)

**tacit knowledge** (278)

## Language and Literacy

- Use of vocabulary, grammar, and syntax become increasingly sophisticated, but the major area of linguistic growth is in pragmatics.
- Methods of second-language education are controversial. Issues include speed and facility with English, long-term achievement in academic subjects, and pride in cultural identity.
- Despite the popularity of whole-language programs, early phonetics training is a key to reading proficiency.

**pragmatics** (279)

**English-immersion approach** (280)

**bilingual education** (280)

**bilingual** (280)

**two-way (dual-language) learning** (280)

**decoding** (280)

**phonetic (code-emphasis) approach** (280)

**whole-language approach** (280)

**visually based retrieval** (280)

## The Child in School

- Children's self-efficacy beliefs affect school achievement.
- Girls tend to do better in school than boys.
- Parents influence children's learning by becoming involved in their schooling, motivating them to achieve, and transmitting attitudes about learning.
- Socioeconomic status can influence parental beliefs and practices that, in turn, influence achievement.
- Peer acceptance and class size affect learning.
- Current educational issues and innovations include charter schools and homeschooling.

## Educating Children with Special Needs

- Three frequent sources of learning problems are intellectual disability, learning disabilities (LDs), and attention-deficit/hyperactivity disorder (ADHD). Dyslexia is the most common learning disability.
- An IQ of 130 or higher is a common standard for identifying gifted children.
- Creativity and IQ are *not* closely linked.
- Special educational programs for gifted children stress enrichment or acceleration.

**intellectual disability** (286)

**learning disabilities (LDs)** (286)

**dyslexia** (286)

**attention-deficit/hyperactivity disorder (ADHD)** (286)

**enrichment programs** (288)

**acceleration programs** (288)

**creativity** (288)

**convergent thinking** (288)

**divergent thinking** (288)

chapter

# 10

## outline

- The Developing Self
- The Child in the Family
- The Child in the Peer Group
- Mental Health

## learning objectives

- Discuss emotional and personality development in school-age children.
- Describe changes in family relationships in the school-age years.
- Identify changes in peer relationships among school-age children.
- Describe emotional disorders that can develop in school-age children, along with treatment techniques and children's ability to cope with stress.

# Psychosocial Development in Middle Childhood



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## did you know?

- Culture influences how children recognize, feel, and express their emotions.
- There are few significant differences in adjustment between adopted and nonadopted children.
- Patterns of bullying and victimization may become established as early as kindergarten.

*In this chapter, we see how children develop a more realistic self-concept. Through interacting with peers, they make discoveries about their own attitudes, values, and skills. Still, the kind of household a child lives in and the relationships in it can profoundly affect psychosocial development. We look at several mental health problems and at resilient children, who can emerge from stress healthy and strong.*



**T**here can be no keener revelation of a society's soul than the way in which it treats its children.

—Nelson Mandela (1918–2013)

## The Developing Self

The cognitive growth that takes place during middle childhood enables children to develop more complex concepts of themselves and to gain in emotional understanding and control.

### SELF-CONCEPT DEVELOPMENT

"At school I'm really good at some things. I really like math and science, and I get the best scores on tests of all the other kids," says 8-year-old Emily. "But I'm not so good at civics and economics and language arts, and sometimes I feel bad when I see how good the other kids are doing. I still like myself, though, because I don't really care that much about those classes."

Earlier in development, young children have difficulty with abstract concepts and with integrating various dimensions of the self. Their self-concepts focus on physical attributes, possessions, and global descriptions. However, at around age 7 or 8, children reach the third stage of self-concept development. At this time, judgments about the self become more conscious, realistic, balanced, and comprehensive as children form **representational systems**: broad, inclusive self-concepts that integrate various aspects of the self (Harter, 1998).

We see these changes in Emily's self-description. She can now focus on more than one dimension of herself. She has outgrown her earlier all-or-nothing, black-or-white self-definition. Now, she recognizes that she can be "smart" in certain subjects and "dumb" in others. She can verbalize her self-concept better, and she can weigh different aspects of it. She can compare her real self (who she is) with her ideal self (who she wants to be) and can judge how well she measures up to social standards in comparison with others. All of these changes contribute to the development of self-esteem, her assessment of her global self-worth ("I still like myself").

#### representational systems

In neo-Piagetian terminology, the third stage in development of self-definition, characterized by breadth, balance, and the integration and assessment of various aspects of the self.

### INDUSTRY VERSUS INFERIORITY

According to Erikson (1982), a major determinant of self-esteem is children's view of their capacity for productive work, which develops in his fourth stage of psychosocial development: **industry versus inferiority**. As with all of Erikson's stages, there is an opportunity for growth represented by a sense of industry and a complementary risk represented by inferiority.

In the event that children are unable to obtain the praise of adults or peers in their lives, or lack motivation and self-esteem, they may develop a feeling of low self-worth and thus develop a sense of inferiority. This is problematic because during middle childhood, children must learn skills valued in their society. If children feel inadequate compared with their peers, they may retreat to the protective embrace of the family and not venture farther away from home. Developing a sense of industry, by contrast, involves learning how to work hard to achieve goals. If the stage is successfully resolved, children develop a view of themselves as being able to master skills and complete tasks. However, this can go too far. If children become too industrious, they may neglect social relationships and turn into workaholics.

The details vary across societies: Arapesh boys in New Guinea learn to make bows and arrows and to lay traps for rats; Arapesh girls learn to plant, weed, and harvest; Inuit

#### industry versus inferiority

Erikson's fourth stage of psychosocial development, in which children must learn the productive skills their culture requires or else face feelings of inferiority.



*This young girl helps her family tend to their farm, developing her sense of competence and building her self-esteem. By taking responsibilities that match her growing capabilities, she also learns how her Burkina Faso society works, what her role is in it, and what it means to do a job well.*

Joerg Boethling/Alamy Stock Photo

*Conflicting emotions are important in adults as well. The experience of feeling mixed emotions is associated with self-realization and having a meaningful purpose in life (Berrios et al., 2018).*



children of Alaska learn to hunt and fish; and children in industrialized countries learn to read, write, do math, and use computers. What these different experiences share, however, is an emphasis on developing responsibility and motivation to succeed.

## EMOTIONAL DEVELOPMENT

As children grow older, they are more aware of their own and other people's feelings. They can better regulate or control their emotions and can respond to others' emotional distress (Saarni et al., 2006). Children also learn what makes them angry, fearful, or sad and how other people react to displays of these emotions. They know that remembering things that happened in the past and thinking about things that are going to happen in the future can affect your mental state (Lagattuta, 2014). Children start to understand that they and others can have conflicting emotions (Zajdel et al., 2013). As Emily says, "My brother is OK, but he can be annoying sometimes. I love him, but he does things that make me mad. But I don't yell at him because if I do, he cries and then I feel guilty."

Understanding others' emotions is important. For instance, the recognition of emotional distress in others is important for the development of empathy. Empathy includes a cognitive component (the capacity to understand the emotions of others) and an affective component (the capacity to feel the emotions of another person) (Eisenberg et al., 2010). Although their neural circuits overlap, generally, the cognitive component of empathy is linked to activation of the ventromedial prefrontal cortex, and the affective component is linked to activation of the anterior insula and midcingulate cortex (Walter, 2012). Early experiences are also important. Interactional synchrony in infancy (described in Chapter 6) (Levy et al., 2019) and parental warmth and sensitivity predict children's later empathy (Spinrad & Gal, 2018).

Parents help shape their children's growing understanding of emotions. When parents are skilled at the recognition of emotions in others, label emotions, and allow children the latitude to express emotions, their children understand and recognize emotions better (Castro et al., 2015). Parents who acknowledge children's feelings of distress and help them focus on solving the root problem foster empathy, prosocial development, and social skills (Bryant, 1987; Eisenberg et al., 1996). Prosocial children tend to act appropriately in social situations, to be relatively free from negative emotion, and to cope with problems constructively (Eisenberg et al., 1996). By contrast, when parents respond to the expression of emotions with excessive disapproval or punishment, emotions such as anger and fear may become more intense and may impair children's social adjustment (Fabes et al., 2001), or children may become secretive and anxious about negative feelings (Almas et al., 2011). As children approach early adolescence, parental intolerance of negative emotions may heighten parent-child conflict (Fabes et al., 2001).

Have you ever received a gift you didn't like or had to hold in your anger to avoid getting in trouble? The ability to fake liking a gift or to smile when you are mad involves emotional self-regulation. Emotional self-regulation is effortful (voluntary) control of emotions, attention, and behavior.

The development of emotion regulation has behavioral and academic consequences. Children who are good at self-regulation tend to be socially competent and do well in school (Eisenberg et al., 2016). The converse is also true. Children who at 3 to 4 years of age had difficulty in delay-of-gratification tasks were more likely to have behavior problems at 5 to 8 years. Similarly, young children who were poor at deliberately slowing down, inhibiting their movements in a game, or paying close attention were more likely to have academic difficulties when older (Kim et al., 2013). Emotion regulation may also be involved in the development of anxiety disorders, not necessarily in the formation of initial fears but in their maintenance and reinforcement (Cisler et al., 2010).

The changes in children's self-control abilities may help explain why the influence of parental support of emotions changes over time. In early childhood, parents who support their children's emotional responses, perhaps by actively soothing an upset child rather than ignoring an outburst, are more likely to have socially competent children (Fabes et al., 2001). Behaviors such as these are associated with secure attachment, which has been linked to the development of emotion understanding and better emotion regulation processes (Parrigon et al., 2015). In middle childhood, this relationship reverses, and parents who pull back their support of their child's emotional expressions tend to have children better able to regulate their own emotions and who have fewer internalizing and externalizing problems (Mirabile et al., 2018; Nelson & Boyer, 2018). This is because as children become more emotionally competent, parents who withdraw support thus provide those children with more opportunities to practice their emerging abilities.

Parents transmit important cultural values within the context of their interactions with children. For instance, American and German parents are likely to focus on the causes and consequences of feelings when discussing emotions with their children, reflecting their emphasis on autonomy and independence. Conversely, Chinese parents, who are more concerned with group harmony, are more likely to emphasize proper behavioral conduct and moral lessons in their discussions. However, Mexican parents, who tend to endorse compliance with social norms without disputing authority, are unlikely to have extended conversations about emotions (Friedlmeier et al., 2011).

Cultural values also influence children's emotional experiences. Some cultures that stress social harmony, including those in Asia, Germany, and Israel, discourage open expressions of anger. When expressions of anger do appear, they seem to draw notice. The opposite is true in cultures such as the United States and Greece, which stress self-expression, self-assertion, and self-esteem, and where emotions such as sadness garner more attention (Hareli et al., 2015; Cole et al., 2002). The social emotions of shame, pride, and guilt are also affected by culture. For example, one study found that children in the United States expressed the most pride, Japanese children the most shame, and Korean children the most guilt (Furukawa et al., 2012). In another illustrative study, when Brahman children from India were asked how they would feel in a difficult interpersonal situation, they reported they would feel anger, while Tamang children from Tibet reported shame as their most likely emotion (Cole et al., 2002). Brahman adults generally ignore shame and respond to angry children with reasoning and yield to their demands. Tamang adults expect children to be socially compliant and are intolerant of anger but will reason with and yield to children who are ashamed. Thus, children learn to shape their emotional responses to what is expected and tolerated of them (Cole et al., 2006).

While children become better at identifying and understanding emotions with age, some children lag behind, and this can cause social and behavioral issues. Fortunately, children can be trained to more accurately understand emotions—both their own and those of others—and such interventions show promise (Sprung et al., 2015). For example, class interventions have been shown to help children develop empathy for others, increase spontaneous prosocial behavior, and decrease aggressive acts (Schonert-Reichl et al., 2012).

## checkpoint can you...

- Discuss how the self-concept develops in middle childhood?
- Describe Erikson's fourth stage of psychosocial development?
- Identify several aspects of emotional growth in middle childhood?

# The Child in the Family

To understand the child in the family, we need to look at the family environment—its atmosphere and structure—and examine it within the context of the modern world.

## FAMILY ATMOSPHERE

Key influences in the family are how parents respond to emerging control of behavior; whether or not they work in or outside the home; and the family's socioeconomic status.

**Coregulation and Parental Control Strategies** Babies don't have a lot of say in what happens to them; they experience what their parents decide they should experience.



In general, adults are not very good at distinguishing when children lie. Adults are able to identify lies only slightly better than would be predicted by chance (Strömwall et al., 2007).

### coregulation

Transitional stage in the control of behavior in which parents exercise general supervision and children exercise moment-to-moment self-regulation.

However, as children become more autonomous, control gradually shifts from parents to child. Children begin to request certain types of experiences, negotiate for desired objects, and communicate their shifting needs to parents. One of the major influences in the family is how parents and children navigate this changing balance of power.

Middle childhood brings a transitional stage of **coregulation** in which parent and child share power. While parents still exercise oversight, children enjoy moment-to-moment self-regulation (Maccoby, 1984). For example, with regard to problems among peers, parents might now rely less on direct intervention and more on discussion with their child.

The amount of autonomy parents provide affects how children feel about them. In one study, parents who were overbearing and overly directive when children were toddlers also tended to show low support for their child's autonomy at 10 years of age, and this in turn was associated with children's lowered expression of positive feelings for parents (Ispa et al., 2015). But this is a two-way street. How children respond to parents' attempts to regulate their behavior is affected by the overall relationship between parent and child. Children are more apt to follow their parents' wishes when they believe the parents are fair and concerned about the child's welfare and that they may "know better" because of experience. This is particularly true when parents take strong stands only on important issues (Maccoby, 1984).

The shift to coregulation affects the ways parents handle discipline (Kochanska et al., 2008). Parents of school-age children are more likely to use inductive techniques, explain how actions affect others, highlight moral values, or let their children experience the natural consequences of their behaviors.

Some families are more likely to use coercive parenting practices such as physical punishment, although its use tends to decrease as children get older. Generally, physical punishment is associated with negative outcomes for children. Those parents who continue to spank their children past the age of 10 years tend to have worse relationships with their children in adolescence and to have teens with more severe behavioral problems (Lansford et al., 2009).

**Cultural Differences in Family Dynamics** The ways in which parents socialize their children reflect important cultural values. For instance, in the Xhosa families of southern Africa and the Yanomamo of the Amazon, adults encourage young boys to hit each other, often holding them in place until they do so, and displays of aggression are rarely, if ever, punished (Mayer & Mayer, 1970; Chagnon, 1968). Both boys and girls in the Gapun villages of Papua New Guinea are encouraged to aggress against each other and are further encouraged to hit dogs and chickens as well (Kulick, 1997). All three cultures share a propensity toward aggression and violent behavior within their own groups as well as engaging in significant conflict between neighboring groups. Thus, parents deliberately socialize aggression in their children. Rather than being damaging, this socialization prepares children for the eventualities of their adult life. In the United States, in African American families, particularly as children get older, parents often explicitly prepare children for issues of racial bias (see Research in Action).

In the United States and most Western countries, authoritative parenting, with its mix of control and warmth, is associated with academic achievement, lower rates of both internalizing and externalizing behavioral problems, and moral reasoning, although these effects are small (Pinquart, 2016, 2017, 2017; Pinquart & Fischer, 2021). However, the strength and even the direction of these associations vary by culture. For instance, the relationship between authoritative parenting and academic achievement is stronger in White families, Western cultures, and families from cultures high in individualism (Pinquart & Kauser, 2018).

Parental attempts to exert control can also be interpreted differently across cultures. Researchers find in cultures that stress family interdependence (such as in Turkey, India, and Latin America), authoritarian parenting, with its high degree of control, is not associated with negative maternal feelings or low self-esteem in children as it is in more individualistic cultures (Rudy & Grusec, 2006). Additionally, in children from some Asian cultures, authoritarian rather than authoritative parenting is associated with academic achievement (Kordi & Baharudin, 2010). This may be because children in cultures

Parents across the world regularly use the threat of evil beings or demons eating or abducting naughty children as a means by which to control their children's behaviors (Lancy, 2015).



## “THE TALK”: RACIAL SOCIALIZATION IN AFRICAN AMERICAN FAMILIES

As Jordan, an 11-year-old Black boy, sat at the dinner table with his parents, they reminded him of what it might be like for him to interact with police officers and how these encounters might make him feel. This wasn't the first time Jordan's parents had talked to him about how to conduct himself when in the presence of law enforcement. This also wasn't the first time during these talks that Jordan felt nervous and concerned about facing discrimination.

Police officers tend to overestimate the age of Black male youth and see them as less innocent compared to White children of the same age; Black children 10 to 13 years old are perceived to be the same age of non-Black children who are 14 to 17 years old (Goff et al., 2014). African American families recognize the necessity to educate their children about how to navigate a society in which they will experience bias, discrimination, and racism.

Talking to youth specifically about how to speak and comport themselves around police officers is a critical component of “The Talk” that African American parents have with their children. These conversations are a form of racial socialization in which parents have difficult but necessary ongoing conversations with their children to instill them with knowledge and guid-

ance on how to manage situations with law enforcement (Anderson et al., 2021).

These discussions, though intimidating for both children and parents, are meant to empower Black youth in their understanding of their world and their ability to strategize and make informed decisions in social environments. In an analysis of psychosocial prevention and intervention programs, researchers found that messaging to Black youth focusing on the positive aspects of the Black experience and feelings of empowerment in one's identity (i.e., racial pride messages) can serve as protective factors for Black children and their development (Jones & Neblett, 2016). These messages along with continued parent-child communication on these topics are imperative to developing Black youth's confidence in managing discriminatory racial encounters.



What conversations, if any, did you have with your family growing up to discuss biased or discriminatory encounters that you may have faced? What guidance or advice would you give to a child to prepare them to interact with law enforcement?

such as these, rather than becoming angry at restrictions, interpret them as well-meaning expressions of concern (Soenens & Beyers, 2012). Latino parents, for example, have well-adjusted children as often as other groups, although they tend to exert more control over their school-age children than European American parents do (Halgunseth et al., 2006) and expectations for girls are even more strict (Domènec Rodriguez et al., 2009). Moreover, in Central American Bofi families, an authoritarian parenting style leads to outgoing, empathic, nonaggressive children—the opposite of the results traditionally found in WEIRD samples (Fouts, 2005). With respect to low control, children of Iranian (Kazemi et al., 2010), Spanish (Garcia & Gracia, 2009), and some European parents (Calafat et al., 2014) with a permissive parenting style have good outcomes, contrary to what has been found in American samples. Thus, the influence of the different parental control strategies is shaped by the cultural context in which it occurs.

**Family Conflict** Constructive family conflict may help children learn how to solve interpersonal problems, communicate effectively, and understand how to resolve conflict without damaging social relationships (McCoy et al., 2013). However, frequent exposure to violence and conflict is harmful for children, both in terms of direct exposure via parental discord (Harold & Sellers, 2018) and via indirect influences on variables such as low family cohesion and ineffective anger regulation strategies (Houltberg et al., 2012).



Although school-age children spend less time at home, family influences continue to be important in their lives.  
Denis Kuvaev/Shutterstock

- Describe how coregulation works, and how discipline and the handling of family conflict change during middle childhood?

#### internalizing behaviors

Behaviors by which emotional problems are turned inward; for example, anxiety or depression.

#### externalizing behaviors

Behaviors by which a child acts out emotional difficulties; for example, aggression or hostility.

Why is it mothers in two-parent families are more likely to take on part-time work than fathers?



Both internalizing behaviors and externalizing behaviors are more likely in children who come from families with high levels of conflict, whether or not parents are married or divorced (Harold & Sellers, 2018). Internalizing behaviors include anxiety, fearfulness, and depression—anger turned inward. These behaviors are more common in children whose parents resolve conflict with anger and depression. Externalizing behaviors include aggression, fighting, disobedience, and hostility—anger turned outward. The likelihood of children showing such behaviors declines as the use of constructive conflict resolution strategies increases (Craft et al., 2021).

**Maternal Employment** Because there has not been much variability in paternal employment but women have increasingly joined the work force, most studies of the impact of parents' work on children's well-being have focused on employed mothers. In 1975, the participation rate of mothers with children in the US labor force was 47 percent (US Bureau of Labor Statistics, 2008). By 2020, 71.2 percent of US mothers worked either full- or part-time (US Bureau of Labor Statistics, 2021).

Research conducted prior to the pandemic shows that, in general, the more satisfied a mother was with her employment status, the more effective she was likely to be as a parent. However, the impact of a mother's work depends on many other factors, including the child's age, sex, temperament, and personality; whether the mother works full or part-time; why she is working; whether she has a supportive or unsupportive partner, or none; the family's socioeconomic status; and the type of care the child receives before and/or after school (Parke, 2004; Gottfried & Gottfried, 2013). Often a single mother must work to stave off economic disaster. How her working affects her children may hinge on how much time and energy she has left to spend with them. How well parents keep track of their children and monitor their activities may be more important than whether the mother works for pay (Fosco et al., 2012).

Mothers are far more likely to take on part-time work than fathers (Weeden et al., 2016). All things being equal, children tend to do slightly better in school if one parent is able to work part-time (Goldberg et al., 2008). However, in the real world, all things are not equal. Although it is difficult to pin down the multiplicity of influences, longitudinal research indicates that overall, children from dual-earner families do well, and there are advantages, such as the increase in income, associated with having working parents (Gottfried, 2021).

When both parents work outside the home, child care arrangements are common. Half of United States grade school children are in some form of child care outside of school, often with relatives (Laughlin, 2013), while others attend organized programs. When children are enrolled in high-quality programs, they show positive changes in social conscience, decision making, critical thinking, academic outcomes, attachment to their school, peer relationships, and self-confidence, and they show declines in problem behaviors and drug use (Smischney et al., 2018; Durlack et al., 2010).

Approximately 11 percent of school-age children and early adolescents are reported to be in self-care, regularly caring for themselves at home without adult supervision (Laughlin, 2013). This arrangement is advisable only for older children who are mature, responsible, and resourceful and know how to get help in an emergency—and, even then, only if a parent can stay in touch by telephone.

How did the COVID-19 pandemic influence these processes? In the United States, although unemployment increased across many groups during the pandemic, the economic consequences disproportionately affected women (US Bureau of Labor Statistics, 2021). Similar findings emerged in Canada, Germany, the Netherlands, Spain, and the United Kingdom. The primary reason mothers across these countries gave for their difficulties securing and retaining employment were increased child care needs due to school and day care closures. Moreover, women were also more likely than men to work in occupations affected by the pandemic, such as hospitality, and hence were more likely to be affected by lockdowns (Alon et al., 2021).

The pandemic also affected work-life balance for mothers and fathers differently. During the COVID-19 pandemic, women reported providing more hours of child care

than did men. Moreover, whether or not a woman worked outside of the home did not affect who cared for a child. However, those women working out of the home—or trying to in the face of repeated child care and school disruptions—were more likely to leave the workforce or reduce their working hours (Zamarro & Prados, 2021).

**Poverty** About 14.4 percent of US children up to age 17 lived in poverty in 2019. The poverty rate for White children was 8.3 percent. Rates were much higher for Black (26.8 percent) and Hispanic (20.9 percent) children. Children living with single mothers were almost 6 times more likely to be poor than children living with married couples—36.4 percent as compared with 6.4 percent (Federal Interagency Forum on Child and Family Statistics, 2021).

Although the full impact of COVID-19 on child poverty remains to be seen, estimates are that thus far, approximately 12.5 million more American children are living in poverty in 2021 than prior to the pandemic. These increases were particularly pronounced among African American and Latino children and female-headed households (Chen & Thomson, 2021). Although this number is distressingly high, it is also the case that COVID-related economic relief and the Child Tax Credit enacted in 2021 kept an additional 6 million children from poverty (Parolin et al., 2021). It is likely the continuing influence of the pandemic will serve to exacerbate existing disparities in socioeconomic status.

Poverty can harm children's development through a multitude of pathways. Parents who live in poverty are likely to become anxious, depressed, and irritable and thus may become less affectionate with and responsive to their children. There may be increased levels of parent-child conflict and harsh discipline. Moreover, poverty also affects where children go to school and the neighborhood they live in, features that can exacerbate child stressors. These features in turn also affect parents and their perceived stress. In short, there are cascades of negative interactions that can have a deleterious effect on child outcomes. These outcomes include physical health, behaviors, mental health, and cognitive and intellectual development (Chaudry & Wimer, 2016; Morris et al., 2017; Yoshikawa et al., 2012).

Fortunately, this pattern is not inevitable. Effective parenting can buffer children from the potential consequences of poverty. Family interventions promote positive parent-child interactions (for example, by encouraging parents to praise their children while also helping them develop reasonable rules and limits) and provide social support for parents (Morris et al., 2017). Community organizations, schools, and pediatricians can also be utilized to provide services and advocacy for children affected by poverty (Ellis & Dietz, 2017; Dreyer et al., 2016; Durlak et al., 2011).

### checkpoint can you...

- Identify ways in which parents' work can affect children?
- Discuss effects of poverty on parenting?

## FAMILY STRUCTURE

In 1970, most countries with democratic market economies had marriage rates between 7 to 10 per 1,000. Currently, this has dropped to an average of 4.6 marriages per 1,000. In some countries, such as China, Italy, Portugal, and Slovenia, marriage rates are nearly half of those found in countries such as Hungary, Latvia, Lithuania, and Turkey (Organisation for Economic Co-operation and Development, 2021).

Family structure in the United States has changed dramatically. In earlier generations, the vast majority of children grew up in families with two married parents. Today, although 67 percent of children under 18 live with two married biological, adoptive, or stepparents, that proportion represents a dramatic decline—from 85 percent in 1960 to 66 percent in 2019. About 9 percent of two-parent families are stepfamilies resulting from divorce and remarriage, and 4 percent are cohabiting families (Federal Interagency Forum on Child and Family Statistics, 2021; Figure 1). Other increasingly common family types are gay and lesbian families and grandparent-headed families.

Other things being equal, children tend to do better in families with two continuously married parents than in cohabitating, divorced, single-parent, or stepfamilies (Brown, 2010). With respect to variations in two-parent family structures, there are relatively few differences in child well-being regardless of whether children live with biological cohabitating families, married/cohabitating stepfamilies, or blended families (Artis, 2007).

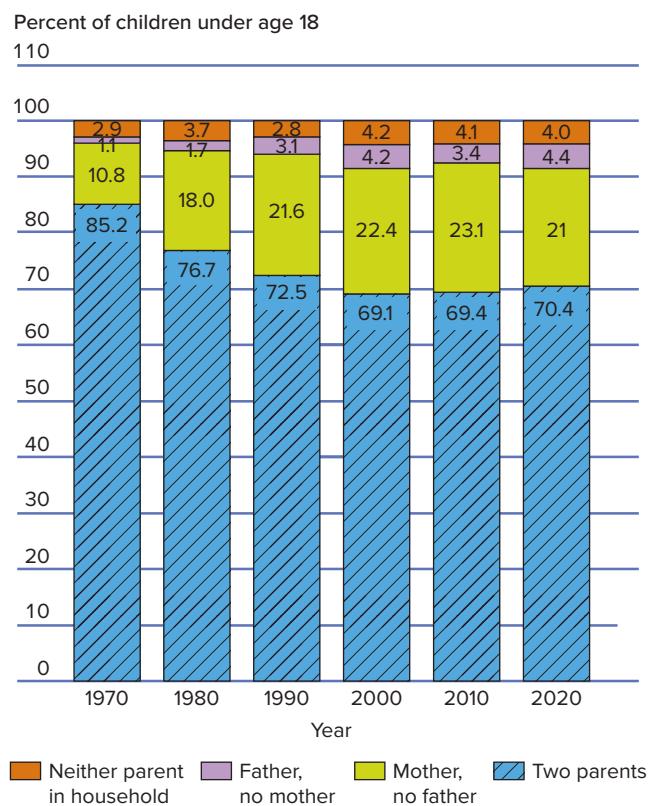
**FIGURE 1**

## Living Arrangements of Children Younger Than 18, 1970 to 2020

Most children under 18 in the United States live with two parents, but the prevalence of that household type has been diminishing.

Source: Federal Interagency Forum on Child and Family Statistics. (2020). America's children: Key national indicators of well-being, 2020. US Government Printing Office.

Notes: Children living with two married parents may be living with biological, adoptive, or nonbiological parents. Prior to 2007, children who lived with their mother or father only may also have lived with the parent's unmarried partner.



A father's frequent and positive involvement with his child is directly related to the child's well-being and physical, cognitive, and social development (McLanahan et al., 2013; Adamsons & Johnson, 2013). Unfortunately, in 2021, 25.3 percent of children lived in homes without a father present (US Census Bureau, 2021).

**Divorce** Overall, divorce has become more common across the globe (Wang & Schofer, 2018). However, divorce rates differ sharply across countries—from a low of 0.7 divorces per 1,000 people in Malta to a high of almost 5 divorces per 1,000 people in Russia (Organisation for Economic Co-operation and Development, 2021). In the United States, the divorce rate rose from 1960 (2.2 per 1,000 people) to its peak level in 1980 (3.5 per 1,000 people) (Amato, 2014; Cherlin, 2010). Since then, the divorce rate has slowly dropped and currently stands at 2.7 per 1,000 people (Centers for Disease Control and Prevention, 2021).

In most European countries, the divorce rate has been increasing since the 1960s (Amato, 2014). In Asia and Southeast Asia, divorce rates have likewise climbed and are similar to those found in Europe, ranging from 2 to 3 divorces per 1,000 people. In South Asia, by contrast, divorce rates are low and stable, primarily because many women do not have the option of returning to their family of origin if they divorce and are generally not able to earn an income to support themselves independently (Jones, 2015). In sub-Saharan Africa, although divorce is common, divorce rates as a whole are stable or decreasing, a trend that appears to be associated with an increase in age at first marriage and higher levels of education for women (Clark & Brauner-Otto, 2015).

Divorce is common in foraging societies (Lancy, 2014). For example, divorce rates in the !Kung of the Kalahari in the first 5 years of marriage are about 37 percent (Howell, 2017). In the Hadza of Tanzania, divorce rates in the first 5 years of marriage are 39 percent (Jones et al., 2017), and only about 20 percent stay married to the same person for life. Infidelity is cited as a frequent precipitant (Marlowe, 2010). In the Pume of Venezuela, marriage is informal and divorce can be instigated by either spouse (Greaves & Kramer, 2018). In agrarian societies, the practice of polygyny reduces the likelihood of

divorce, although it still occurs (Lancy, 2014). For instance, in the Igbo farming communities of rural Nigeria, divorce is frequent, with infidelity, infertility, impotence, and laziness cited as common antecedents (Enwereji, 2008). As in industrialized cultures, divorce can put children at risk. In the Aché of Paraguay, father absence as a result of divorce or death is associated with 25 percent higher risk of child death (Hurtado & Hill, 1995).

**Adjusting to Divorce** Divorce is stressful for children. First there is the stress of marital conflict and then of parental separation with the departure of one parent, usually the father. Children may not fully understand what is happening. Divorce is, of course, stressful for the parents as well and may negatively affect their parenting. The family's standard of living is likely to drop; and if a parent moves away, a child's relationship with the noncustodial parent may suffer (Kelly & Emery, 2003; Amato, 2014).

Most divorces involve some degree of conflict, an important consideration given family conflict is a consistently identified risk factor for children (Stallman & Ohan, 2016). Thus, when children exhibit emotional or behavioral problems after a divorce, this may actually reflect the influence of parental conflict before the divorce. Children whose parents later divorce show more anxiety, depression, or antisocial behavior prior to the divorce than those whose parents stay married (Strohschein, 2012). In fact, if predivorce parental discord is chronic, overt, or destructive, children may be as well or better off after a divorce. Indeed, it matters less if parents are married or separated than if they engage in frequent or extended conflict (Harold & Sellers, 2018). Additionally, the quality of parenting prior to divorce matters as well, with maternal sensitivity and support acting as protective factors for some children whose families divorced (Weaver & Schofield, 2015).

**Custody, Visitation, and Co-parenting** There are various types of custody arrangements. In most divorce cases, the mother gets custody, though paternal custody is a growing trend. Joint custody, shared by both parents, is another arrangement. When parents have joint legal custody, they share the right and responsibility to make decisions regarding the child's welfare. When they have joint physical custody, the child lives part-time with each parent.

Research suggests children do better with joint custody (Warshak, 2014; Baude et al., 2016), perhaps because fathers are more likely to remain involved. Many children of divorce say that losing contact with a father is one of the most painful results of divorce (Fabricius, 2003). Children living with divorced mothers adjust better when the father pays child support, which may indicate a strong tie between father and child (Kelly & Emery, 2003).

When one parent has custody, children do better after divorce if the custodial parent is warm, supportive, and authoritative; monitors the child's activities; and holds age-appropriate expectations. In addition, conflict between the divorced parents needs to be minimal, and the nonresident parent should remain closely involved (Stallman & Ohan, 2016; Ahrons & Tanner, 2003). Conflict, as before divorce, is damaging and can result in lower life satisfaction, negative affect, externalizing symptoms, and adolescent delinquency (Lamela et al., 2016; Teubert & Pinquart, 2010; Esmaelli & Yaacob, 2011). High conflict between parents, especially if a child is drawn into the conflict and forced to choose sides, can be extremely damaging (Fosco & Grych, 2010).

Co-parenting is a parenting relationship in which two people work together in a cooperative fashion to raise a child. With respect to divorced couples, it involves shared responsibility and active consultation between both partners on parenting decisions. Co-parenting has been consistently linked to positive child outcomes (Teubert & Pinquart, 2010), in part because it is strongly associated with more frequent contact between father and child (Sobolewski & King, 2005). For instance, children whose parents are able to parent cooperatively following a divorce tend to have closer ties to their fathers—and fewer behavioral problems—than children whose parents have more conflict following divorce.



*Children of divorce tend to be better adjusted if they have reliable, frequent contact with the noncustodial parent.*

Eric Audras/Onoky/SuperStock

(Amato et al., 2011). Unfortunately, cooperative parenting is not the norm (Amato, 2005). Parent education programs that teach separated or divorced couples how to prevent or deal with conflict, keep lines of communication open, and help children adjust to divorce have been introduced in many states with measurable success (Ferraro et al., 2016).

*Outcomes of Divorce* Findings on children's adjustment to divorce tend to be quite similar across Europe and the United States, with most studies finding that when compared to children raised by two continuously married parents, children of divorced parents show poorer outcomes, including more conduct problems and emotional problems, lower academic achievement, and more difficulty with interpersonal relationships. As adults, they obtain less education and have a lower income than children of married parents, and they are more likely to suffer from physical health problems and have a higher chance of their own marriages ending in divorce (Amato, 2014). Moreover, they are more likely to have poorer psychological well-being and a higher risk of depression (Amato, 2005; Uphold-Carrier & Utz, 2012). Additionally, adults whose parents divorced when they were children and who endured multiple or prolonged separation from a parent later may show compromised parenting themselves, including lower sensitivity and warmth, and more parent-child conflict and physical punishment (Friesen et al., 2017).

A child's adjustment to divorce depends in part on the child's age, maturity, gender, temperament, and psychosocial adjustment before the divorce. Children who are younger when their parents divorce tend to suffer from more behavioral problems. By contrast, older children are at higher risk with respect to academic and social outcomes (Lansford, 2009). However, most children whose parents divorce eventually show good adjustment (Amato & Anthony, 2014).

Negative effects as a consequence of parental divorce are not inevitable. For instance, children show fewer issues if their parents' divorce does not lead to a decline in their standard of living and they are able to remain in the same neighborhood and schools. Additionally, if their parents adjust well themselves, parent in an authoritative manner, and are able to engage in positive co-parenting, children tend to do better (Amato, 2014).

**One-Parent Families** One-parent families can result from divorce or separation, unwed parenthood, or death. Globally, approximately 7 percent of children live in single-parent families. The United States has the highest share of single parenting worldwide, and the number of single-parent families in the United States has increased by over 3 times since 1960. Currently, almost 26 percent of children live in a single-parent household. More than half of all Black children live with a single parent, as compared with 18.1 percent of non-Hispanic White children and 28.1 percent of Hispanic children. Although children are far more likely to live with a single mother than with a single father, the number of father-only families has risen sharply since the 1960s, due largely to the increase in paternal custody after divorce (Kramer, 2019; Hemez & Washington, 2021).

Children in single-parent families do fairly well overall but tend to lag socially and educationally behind peers in two-parent families (Brown, 2010). They also have a higher risk of obesity (Duriancik & Goff, 2019) and tend to make less money as adults than do children from two-parent families (Lerman et al., 2017). However, negative outcomes for children in one-parent families are not inevitable. The child's age and level of development, the family's financial circumstances and educational level, whether there are frequent moves, and a nonresident father's involvement make a difference (Amato, 2005; Seltzer, 2000; Ricciuti, 2004).

One key variable appears to be family stability, or whether or not children grow up with the same parent(s) that were present at birth (Heiland & Liu, 2006). In general, single-parent families are more unstable than married families (Craigie et al., 2012). However, when single-parent or cohabitating families are stable, children fare as well on cognitive and health outcomes as children from two-parent families (Waldfogel et al., 2010).

Income is another important factor. Many of the negative effects of single parenthood appear to be driven by lower socioeconomic status. Because single parents often lack resources, potential risks to children in these families can be reduced through

increased access to economic, social, educational, and parenting support. Indeed, in countries with a robust welfare support system for single mothers, children in such families report higher levels of well-being than children in countries that do not provide as much aid to single mothers (Bjarnason et al., 2012).

**Cohabiting Families** Across the globe, the rates of cohabitation—when unmarried partners live together—varies widely. In countries such as China, Taiwan, South Korea, Japan, Indonesia, Egypt, and Saudi Arabia, fewer than 2 percent of adults cohabit. In Europe, Australia, and New Zealand, cohabitation is more common. Cohabitation has traditionally been more common in Latin America as well, where such unions function similarly to legal marriages and tend to be relatively stable. Rates of cohabitation vary widely across Africa and have shown recent shifts. For example, declines in cohabitation rates in Nigeria may be related to the growth of evangelical Protestant and Islamic influences in the country. Overall, cohabitation is more common in countries with low marriage rates and rare where marriage rates are higher (Social Trends Institute, 2011).

In the United States, rates of cohabitation are high. Approximately 22 percent of parents living with children were cohabitating in 2020 (US Census Bureau, 2021), and about 40 percent of children will spend at least part of their life in a cohabitating household (Manning, 2017). Cohabiting families are similar in many ways to married families, but the parents tend to be more disadvantaged. They traditionally have less income and education, report poorer relationships, and have more mental health problems (Mather, 2010). However, a finer-grained analysis indicates some cohabitating couples are from higher social classes. For these parents, cohabitation is more likely to be seen as a step to marriage and eventually leads to marriage. By contrast, couples from lower socioeconomic classes are more likely to see their cohabitating relationship end or to enter into a number of cohabitating unions over the course of a lifetime (Kroeger & Smock, 2014).

Research shows worse emotional, behavioral, and academic outcomes for children living with cohabiting biological parents than for those living with married biological parents. However, this difference in outcomes is primarily the result of differences in economic resources and family instability (Manning, 2017). Parenting differences explain only a small amount of the variation in child outcomes for cohabitating versus married couples (Thomson & McLanahan, 2012).

Roughly 2 decades ago, research showed cohabiting families were more likely to break up than married families (Amato, 2005). Newer research suggests this may no longer be the case (Smock & Schwartz, 2020). When issues such as the timing of children (Musick & Michelmore, 2015) and the age of the cohabiting couple (Kuperberg, 2014) are taken into consideration, cohabiting families look much more like those of married couples. These new patterns may be because cohabitation has become more normative, and thus it no longer indicates the degree of commitment—or lack thereof—a couple holds for the relationship. Indeed, in a study of 16 European countries, cohabitation was associated with relationship dissolution in those countries in which it was rare. When cohabitation was normative, it did not confer a risk to the relationship. When cohabitation became exceedingly common, it once again was associated with relationship dissolution, presumably because of the increasing selectivity of the subpopulation of married couples relative to the rest of the coupled population (Pelletier & Schnor, 2017).

**Stepfamilies** Most divorced parents eventually remarry, and many unwed mothers marry men who were not the father of their children, forming step-, or blended, families. Fifteen percent of US children live in blended families (Livingston, 2014).

Adjusting to a new stepparent may be stressful. A child's loyalties to an absent or dead parent may interfere with forming ties to a stepparent. For example, when children are emotionally close to a nonresident biological parent, this is associated with increased levels of stress during stepfamily formation in comparison to children who are not close

## checkpoint can you ...

- Assess the impact of parental divorce on children?
- Discuss how living in a single-parent or cohabiting household can affect children?

to their nonresident parent (Jensen et al., 2017). Both children and parents have to navigate shifting relationships, adapt to a new power structure in the family, and adjust to household changes.

Studies have found small to moderate, but consistent, negative effects for children living in stepparent families when compared to those from continually married parents (Sweeney, 2010; Hofferth, 2006). Adjustment to the stepparents and the potential negative influence of that on development appear to be influenced by family relationships prior to the formation of the stepfamily. When there is a good relationship with the biological parent (usually the mother) before the introduction of a stepparent, children show more positive relationships with their stepparent and better adjustment (King et al., 2015; Jensen & Shafer, 2013). Additionally, effective co-parenting within stepfamilies also mitigates potential negative outcomes (Ganong et al., 2021).

**Gay and Lesbian Parents** Globally, same-sex marriage has become increasingly accepted. Currently, 30 countries, primarily in Europe and North and South America, legally recognize gay marriage (Pew Research Center, 2019). In the United States, an estimated 6 million children and adolescents have at least one gay or lesbian parent (Gates, 2015). About 24 percent of lesbian couples and 7.2 percent of gay couples have children living with them (US Census Bureau, 2021).

Although there is still much discrimination leveled toward same-sex relationships, the legalization of same-sex marriage and a decrease in social stigma have resulted in many LGBTQ+ people coming out at earlier ages. In the past, such adults were more likely to have first entered into heterosexual relationships that produced children. Now same-sex couples are less likely to be raising children that were the product of such unions and more likely to jointly be raising children that are the product of reproductive technologies such as artificial insemination or adoption (Gates, 2015).

A considerable body of research has examined the development of children of gays and lesbians and has found no special concerns. There are no consistent differences between homosexual and heterosexual parents in emotional health or parenting skills and attitudes; and where there are differences, they tend to favor gay and lesbian parents (Golombok et al., 2013; Meezan & Rauch, 2005; Pawelski et al., 2006; Biblarz & Stacey, 2010). Gay or lesbian parents usually have positive relationships with their children, and the children are no more likely than children raised by heterosexual parents to have emotional, social, academic, or psychological problems (Perrin et al., 2013; Fedewa et al., 2015; Manning et al., 2014). Furthermore, children of gays and lesbians are no more likely to be homosexual or to be confused about their gender than are children of heterosexuals (Schumm & Crawford, 2019; Fedewa et al., 2015).

Such findings have social policy implications for legal decisions on custody and visitation disputes, foster care, and adoptions. In the face of controversy, several states have considered or adopted legislation sanctioning second-parent adoption by same-sex partners. The American Academy of Pediatrics supports legislative and legal efforts to permit a partner in a same-sex couple to adopt the other partner's child (Perrin et al., 2013; Manning et al., 2014).

**Adoptive Families** Adoption is found in all cultures throughout history. It is not only for infertile people; single people, older people, gay and lesbian couples, and people who already have biological children have become adoptive parents. Approximately 2.3 million US children under 18 (about 2 percent) live with at least one adoptive parent, and about 120,000 children are adopted annually (Child Welfare Information Gateway, 2016; Kreider & Lofquist, 2014).

Same-sex families are more than four times more likely than heterosexual families to adopt children, and they're more likely to have an only child as well (Taylor, 2020).



Research has shown that children living with homosexual parents are no more likely than other children to have social or psychological problems or to turn out to be homosexual themselves.

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Adoptions usually take place through public or private agencies. Traditionally, agency adoptions were intended to be confidential, with no contact between the birth mother and the adoptive parents. However, independent adoptions, made by direct agreement between birth parents and adoptive parents, have become more common. Often these are open adoptions, in which both parties share information or have direct contact with the child (Grotevant, 2012). Whether an adoption is open or closed bears no relation to the children's adjustment or to the parents' satisfaction with the adoption, both of which are generally high (Berry et al., 1998). Moreover, open adoptions are beneficial for birth mothers. Birth mothers who participate in open adoptions have less unresolved grief than those who participate in closed adoptions, and most move on to have other children (Grotevant et al., 2013). Contact can also help the child develop a sense of identity and provide information about family history. However, if contact goes poorly, it may run the risk of undermining children's stability, particularly if negative interactions occur between birth and adoptive parents (Boyle, 2017).

Although adopted children tend to have more psychological and academic difficulties than nonadopted children, these differences are small, and most adopted children fall within the normal range of development (Palacios & Brodzinsky, 2010). Age at adoption matters, however. Children adopted after the age of 1 are more likely to show lower school achievement and disturbances in their attachment patterns than children adopted before their first birthday (Juffer et al., 2011; Mesman et al., 2009). The influence of age at adoption interacts with early experiences; children who experienced the most severe deprivation are the most benefited by early adoption (Julian, 2013). Any problems that do occur may surface during middle childhood, when children become more aware of differences in the way families are formed (Freeark et al., 2005), or in adolescence (Sharma et al., 1996), particularly among boys (Freeark et al., 2005) and international adoptees (Juffer et al., 2011).

Prior to the 1960s, most adopted children in the United States were healthy, White infants, adopted as newborns and surrendered by unmarried teen mothers. Adoption rates for children born to BIPOC women were extremely low. In the 1960s, a variety of social and economic changes, including the growing acceptance of single motherhood and the rise of social support programs, led to an increase in the number of women who kept their babies. Additionally, the growing availability of birth control and the legalization of abortion led to a decrease in unintentional pregnancies.(Brodzinsky & Pinderhughes, 2002).

Currently, only about half of adopted children from public agencies are non-Hispanic White. The remainder are Black (18 percent), Hispanic (20 percent), biracial (9 percent), and other (3 percent) (US Department of Health and Human Services, 2020). Transracial adoptions, where at least one parent is of a different race than the child, are common and comprise over 40 percent of adoptions. Most transracial adoptions involve White parents adopting an Asian or Latin American child (Vandivere et al., 2009), often via international adoption. Changes in adoption protocols making it more difficult for Americans to adopt children from different countries have resulted in a steady decline in international adoptions. In 2016, 5,370 children were adopted from foreign countries, a drop of 77 percent from the peak in 2004 (Budiman & Lopez, 2017).

Does foreign adoption entail special problems? Aside from the possibility of malnourishment or medical conditions in children from developing countries (Bosch et al., 2003), a number of studies find no significant problems with the children's psychological adjustment, school adjustment, and performance (Palacios & Brodzinsky, 2010). However, when foreign adoptees reach adolescence, they may experience feelings of loss of their native culture and growing awareness of racism and discrimination in their adopted culture. Parents who expose their adopted children to experiences that help them identify with their native culture and speak with their children about racism and discrimination may help buffer adopted children from negative effects (Lee et al., 2006).



*Do you think you would ever try to adopt? If so, would you want the adoption to be open? Why or why not?*

### checkpoint can you...

- Identify some special issues and challenges of a stepfamily?
- Summarize findings on outcomes of child raising by gay and lesbian parents?
- Discuss trends in adoption and the adjustment of adopted children?



## SIBLING RELATIONSHIPS

In remote rural areas of Asia, Africa, Oceania, and Central and South America, it is common to see older girls caring for three or four younger siblings (Cicirelli, 1994). This pattern is also seen in recent immigrants to industrialized societies such as the United States (Hafford, 2010). However, in most industrialized societies, parents generally try not to “burden” older children with the regular care of siblings (Weisner, 1993). Older siblings do teach younger siblings, but this usually happens informally and not as an established part of the social system (Cicirelli, 1994).

Sibling relations have both positive and negative aspects to them. Having a warm and supportive sibling relationship is associated with better adjustment, social competence, prosocial behavior, and empathy. In part, this is the result of conflict in the relationship. While generally perceived as negative, conflict can nonetheless be a laboratory for conflict resolution. Siblings are motivated to make up after quarrels because they know they will see each other every day. They learn that expressing anger does not end a relationship. Through these conflicts, siblings learn about others’ points of view, negotiation, and problem solving (McHale et al., 2012).

However, sibling conflict is not always beneficial. High sibling conflict has been associated with internalizing (e.g., depression and anxiety) and externalizing (e.g., delinquency and aggression) problems as well as risky behaviors (Buist et al., 2012; Solmeyer et al., 2012). Siblings can exert a negative effect via modeling antisocial actions, introducing undesirable behaviors to younger siblings or encouraging antisocial acts or collusion against parents (McHale et al., 2012).

For example, when older siblings use drugs or alcohol, or engage in early sexual activity, their younger siblings are more likely to do so as well.

Gender also appears to be an influence on sibling relationships. Sisters are higher in sibling intimacy than brothers or mixed-sex dyads (Kim, et al., 2006). Children are more likely to squabble with same-sex siblings. However, two brothers quarrel more (Cicirelli, 1976) and show less caring and intimacy than any other combination (Cole & Kerns, 2001). Additionally, the negative influence of an older antisocial sibling on a younger sibling, in some research, has been limited to same-sex siblings (Buist, 2010).

Siblings also influence each other indirectly, through their impact on each other’s relationship with their parents. Parents’ experience with an older sibling influences their expectations and treatment of a younger one (Brody, 2004). When a parent-child relationship is warm and affectionate, siblings tend to have positive relationships as well. When the parent-child relationship is conflictual, sibling conflict is more likely (Pike et al., 2005).

### checkpoint can you ...

- Compare sibling roles in industrialized and nonindustrialized countries?
- Discuss how siblings affect each other’s development?

## The Child in the Peer Group

As children begin to move away from parental influence, the peer group opens new perspectives. In foraging cultures, peer groups are composed of groups of children of both sexes and across varying ages. Children from foraging societies are provided with a relatively indulgent childhood and can devote much of their time to play and exploration (Konner, 2017). In developed countries, entry into formal school systems ensures that most children spend the bulk of their waking hours around peers rather than around family. In all cases, peer influences become increasingly important through middle childhood and adolescence.

### PEER GROUPS

Peers can function as sources of information about appropriate behavior, and norms developed within the context of the peer group can influence development. Although

some degree of conformity to group standards is healthy, the peer group can sometimes foster antisocial tendencies. For example, it is usually in the company of peers that some children shoplift and begin to use drugs (Dishion & Tipsord, 2011; Hartup, 1992).

Peer groups may reinforce **prejudice**: unfavorable attitudes toward outsiders, especially members of certain racial or ethnic groups. From about the age of 5, children begin show a bias toward others who are like them and are more concerned with helping and staying loyal to member of their group, while discounting and dehumanizing those who are unlike them (McLoughlin, 2019). These biases peak at about 5 to 7 years of age and then decrease through late childhood. As children move into adolescence, social context and what children learn from others seem to matter more (Raabe & Beelmann, 2011).

Because peers influence the formation of prejudiced beliefs, peer influences can also counteract such beliefs. For instance, children whose social groups or schools have a norm of inclusion are less likely to show prejudiced behavior (Nesdale, 2011; Tropp et al., 2014; Tezanos-Pinto et al., 2010). In one study, children who were prejudiced against refugees showed reductions in that bias when they were read stories about close friendships between English children and refugee children, followed by group discussions (Cameron et al., 2006). In another study, the degree of bias toward immigrants was related to whether the adolescents in the study had immigrant friends. Those who did were more tolerant of differences and showed less bias toward immigrants (van Zalk & Kerr, 2014). Intervention programs, including direct or extended contact, imagined contact, the promotion of empathy, and perspective-taking, have been moderately successful at reducing prejudice (Beelmann & Heinemann, 2014; Jones & Rutland, 2018).

Boys' and girls' peer groups engage in different types of activities. Groups of boys more consistently pursue gender-typed activities (Rose & Rudolph, 2006), whereas those of girls are more likely to engage in cross-gender activities, such as team sports (McHale et al., 2004). Boys play in large groups with well-defined leadership hierarchies and engage in more competitive and rough-and-tumble play. Girls have more intimate conversations characterized by prosocial interactions and shared confidences (Rose & Smith, 2018).

Boys and girls also prefer different characteristics in their friends. Boys report liking friends high in positive affect and low in anxiety, and they are not overly concerned with how empathic their friends are. Girls, by contrast, prefer friends high in empathy and optimism but lower in positive affect (Oberle et al., 2010). Regardless of the differences, both boys and girls report being equally happy with their friends, and their friendships are equally stable over time (Rose & Asher, 2017).

Same-sex peer groups may help children learn gender-appropriate behaviors and incorporate gender roles into their self-concept. A sense of being typical of one's gender and being content with that gender increases self-esteem and well-being, whereas feeling pressure—from parents, oneself, or, in this case, peers—to conform to gender stereotypes lessens well-being (Yunger et al., 2004). Girls are generally subject to less pressure to conform to gender norms at this age (Katz & Walsh, 1991), whereas gender-nonconforming boys are the most likely to be rejected by their peers (Braun & Davidson, 2017).

Although in hunter-gatherer cultures boys and girls tend to play together in similar ways in early childhood, by middle childhood, children increasingly segregate themselves by gender (Lew-Levy et al., 2017). Peer groups then reinforce and shape gendered behaviors. For example, in the Amhara of Ethiopia, boys are ridiculed and mocked by peers for crying, failing to defend themselves, or being effeminate. Girls, by contrast, are insulted for being daring or brave (Messing, 1957). In agrarian cultures, by contrast, gender roles are more rigid and develop earlier in life. In part, this is because girls are more likely to be asked to complete chores close to home, whereas boys' chores have a larger spatial range (Lew-Levy et al., 2017).

## POPULARITY

Much of research in child development depends on asking children the right questions in the right way. If a researcher asked schoolchildren to tell her the social ranking of all

### prejudice

Unfavorable attitude toward members of certain groups outside one's own, especially racial or ethnic groups.



People are more prejudiced under conditions of uncertainty (Kossowska et al., 2017).

*Children who squint  
are invited to fewer  
birthday parties*  
(Mino-Azzi et al., 2010).



### checkpoint can you . . .

- Identify positive and negative effects of the peer group?
- Identify characteristics of popular and unpopular children, and discuss influences on popularity?

the children in a classroom, she would most likely be met with a blank stare. However, children can easily say who they like to play with, who they like the most, or who they think other kids like the most. This is known as a positive nomination.

Children can also easily describe which children they don't like to play with, like the least, or think other kids don't like; this is a negative nomination. By asking these types of questions of every child in a classroom, a researcher can use the aggregated responses to get an overall score, or tally, for each child. The tally may be composed of positive nominations, negative nominations, or no nominations. This measure is known as sociometric popularity.

Sociometrically, *popular* children receive many positive nominations and few negative nominations. They generally have good cognitive abilities, are high achievers, are good at solving social problems, are kind and help other children, and are assertive without being disruptive or aggressive (Cillessen & Mayeux, 2004). They also tend to be extraverted and express more positive emotions than negative emotions (Ilmarinen et al., 2019).

Children can be unpopular in one of two ways. Some children are *rejected*, and they receive a large number of negative nominations. Other children are *neglected* and receive few nominations of any kind. Some unpopular children are aggressive; others are hyperactive, inattentive, or withdrawn (Dodge, 1990; LaFontana & Cillessen, 2002). Still others act silly and immature or anxious and uncertain. Unpopular children are often insensitive to other children's feelings and do not adapt well to new situations (Bierman et al., 1993).

Other children can be *average* in their ratings and do not receive an unusual number of either positive or negative nominations. Finally, some children are *controversial* and receive many positive and negative nominations, indicating that some children like them a great deal and some dislike them a great deal. Less is known about outcomes related to average and controversial sociometric categories.

Popularity is important in middle childhood, although the quality of friendships appears to be more important than the actual number of friends (Schwartz-Mette et al., 2020). Schoolchildren whose peers like them are likely to be well adjusted as adolescents. Those who have trouble getting along with peers are more likely to develop psychological problems, drop out of school, or become delinquent (Dishion & Tipsord, 2011; Mrug et al., 2012; Hartup, 1992). Peer rejection has also been linked to lower levels of classroom participation and poor academic achievement (Ladd et al., 2008; Wentzel & Muenks, 2016).

Children's sociometric popularity is influenced by family context. It is often in the family that children acquire behaviors that affect popularity. When children are from families in which the parent-child relationships are warm and nurturing, and parents provide direct advice about how to manage conflictual social interactions and appropriate high-quality peer experiences, those children tend to be more socially competent (McDowell & Parke, 2009). By contrast, parents who are very controlling or negative in their interactions with their children are more likely to have children who are aggressive, low in social competence, and rejected by peers (Li et al., 2011; Attili et al., 2011; Davies et al., 2018).

Cultural norms can affect children's criteria for popularity. In the late 1990s, China shifted from a collectivist system to a more individualistic and competitive market economy. In 1990, shy children were well accepted by peers and were high in academic achievement, leadership, and teacher-rated competence. However, by 2002, the results were the reverse. Shy children were more likely to be rejected, depressed, and rated by teachers as low in competence (Chen et al., 2005). Similar findings were obtained in more recent research on urban and rural children. Shy urban children were more likely to be depressed or have social and school problems. However, shy rural children, in the more traditional environment of the countryside, had more positive outcomes (Chen et al., 2009). In the new quasi-capitalist society of China, social assertiveness and initiative may be more highly appreciated and encouraged than in the past, and shyness and sensitivity may lead to social and psychological difficulties for children.

## FRIENDSHIP

Children look for friends who are like them in age, sex, activity level, and interests (McDonald et al., 2013; Macdonald-Wallis et al., 2011). Though children tend to choose friends with similar ethnic backgrounds, cross-racial/ethnic friendships are common and associated with positive developmental outcomes (Kawabata & Crick, 2008). Friends agree they are friends, derive pleasure from each other's company, and the relationship, unlike that of siblings, is voluntary (Bagwell & Schmidt, 2011).

School-age children distinguish among "best friends," "good friends," and "casual friends" on the basis of intimacy and time spent together. Children this age typically have three to five best friends but usually play with only one or two at a time (Hartup & Stevens, 1999). School-age girls seem to care less about having many friends than about having a few close friends they can rely on. Boys have more friendships, but they tend to be less intimate and affectionate (Hartup & Stevens, 1999). The prevalence of friends is similar across cultures (French et al., 2012).

Unpopular children can make friends, but they tend to have fewer friends than popular children, and they demonstrate a preference for younger friends, other unpopular children, or children in a different class or a different school (Hartup, 1996; Deptula & Cohen, 2004). This can put children on a negative trajectory, as having few friends or low friendship quality in grade school has been associated longitudinally with loneliness in middle school (Kingery et al., 2011; Schwartz-Mette et al., 2020).

## AGGRESSION AND BULLYING

After age 6 or 7, most children become less aggressive as they grow less egocentric, more empathic, more cooperative, and better able to communicate. They can now put themselves in someone else's place, can understand another person's motives, and can find positive ways of asserting themselves.

Instrumental aggression, aggression aimed at achieving an objective—the hallmark of the preschool period—becomes much less common. However, as instrumental aggression declines overall, hostile aggression, aggression intended to hurt another person, proportionately increases (Dodge et al., 2006), often taking verbal rather than physical form (Pellegrini & Archer, 2005). Being a boy, having a reactive temperament, parental separation, early onset of motherhood, and controlling parenting have all been shown to contribute to physical aggression in 6- to 12-year-olds (Joussemet et al., 2008).

Relational aggression involves harming another person's social status and damaging relationships; for example, by spreading malicious gossip about a person. There is evidence that relationally aggressive children seek out other relationally aggressive children as friends and that both interaction members then mutually influence each other (Sijtsma et al., 2010; Dikstra et al., 2011). Children who are high in relational aggression tend to have parents who are low in positive parenting and high in harsh parenting, mothers who are uninvolved, and fathers who are psychologically controlling (Kawabata et al., 2011).

Some children are more likely to engage in hostile or reactive aggression. For instance, such a child might, after being accidentally pushed by someone in the lunch line, assume that the bump was on purpose and push back angrily. Generally, other children then respond to this hostility with aggression, thereby confirming the child's initial beliefs about their aggression. All children might sometimes assume the worst of others, but children who habitually assume the worst of others in this way are said to have a **hostile attribution bias**. They quickly conclude, in ambiguous situations, that others were acting with ill intent



*Friends often share secrets—and laughs. Friendships deepen and become more stable in middle childhood, reflecting cognitive and emotional growth. Girls tend to have fewer, more intimate friends than boys.*

Jupiterimages/Stockbyte/Getty Images

### checkpoint can you...

- List characteristics children look for in friends?
- Tell how age and gender affect friendships?

#### hostile attribution bias

Tendency to perceive others as trying to hurt one and to strike out in retaliation or self-defense.



Aggressive boys tend to gain in social status by the end of fifth grade, suggesting that bullying behavior may be seen as cool or glamorous by preadolescents.

PhotoAlto/Laurence Mouton/Getty Images

#### **bullying**

Aggression deliberately and persistently directed against a particular target, or victim, typically one who is weak, vulnerable, and defenseless.

and are likely to strike out in retaliation or self-defense (Crick & Dodge, 1996). Rejected children and those exposed to harsh parenting tend to have a hostile attribution bias, as do children who seek dominance and control (Crick & Dodge, 1996; Goraya & Shamama-tus-Sabah, 2013).

**Bullies and Victims** Aggression becomes **bullying** when it is deliberately, persistently directed against a particular target: a victim. Bullying can be physical (hitting, punching, kicking, or damaging or taking of personal belongings), verbal (name-calling or threatening), or relational or emotional (isolating and gossiping, often behind the victim's back). Bullying can be proactive—done to show dominance, bolster power, or win admiration—or reactive, responding to a real or imagined attack.

Patterns of bullying and victimization may become established as early as kindergarten. As tentative peer groups form, aggressors soon get to know which children make the easiest targets. The frequency of bullying increases from elementary school to middle school before declining again in high school (Hong & Espelage, 2012). Almost 30 percent of sixth graders report being bullied, a number that declines to slightly over 12 percent by twelfth grade (Seldin & Yanez, 2019).

Bullying may reflect a genetic tendency toward aggressiveness combined with environmental influences, such as coercive parents and anti-social friends (Berger, 2007). Bullying is associated with parental mental illness, domestic violence, child abuse and neglect, and low parental involvement and support (Nocentini et al., 2019). Bullies also tend to be low in empathy, especially with respect to the ability to experience the emotions that other people are feeling—the affective component of empathy (Fink et al., 2015). Most bullies are boys who tend to victimize other boys; female bullies tend to target other girls (Pellegrini & Long, 2002; Veenstra et al., 2005). Both bullies and victims tend to be deficient in social problem-solving skills (Cook et al., 2010).

Risk factors for victimization seem to be similar across cultures. Victims do not fit in. They tend to be anxious, depressed, cautious, quiet, and submissive, and to cry easily or to be argumentative and provocative (Hodges et al., 1999; Veenstra et al., 2005). They have few friends and may live in harsh, punitive family environments (Nansel et al., 2001; Schwartz et al., 2000). Victims are apt to have low self-esteem, though it is not clear whether low self-esteem leads to or follows from victimization (Boulton & Smith, 1994; Olweus, 1995). Some victims are small, passive, weak, and submissive. Other victims are provocative; they goad their attackers, and they may even attack other children themselves (Berger, 2007; Veenstra et al., 2005). Children who are overweight are more likely to become either victims or bullies (Bacchini et al., 2015; Van Geel et al., 2014). Children who are sexually nonconforming are also at higher risk. For example, almost 40 percent of United States high school students who identify as a sexual minority report having been bullied in the previous year, compared to 22 percent of heterosexual students (Centers for Disease Control and Prevention, 2021). Bullying based on disability, race, nationality, and color is also common (UNESCO, 2019; see Window on the World).

Bullying is harmful to both bullies and victims (Berger, 2007). Both bullies and victims tend to have conduct problems and lower academic achievement (Golmaryami et al., 2016; Shetgiri et al., 2015). Bullies are at increased risk of delinquency, crime, or alcohol abuse. They are also more likely to be diagnosed with anxiety or depression. Victims of chronic bullying tend to develop behavior problems. They may become more aggressive themselves or depressed (Schwartz et al., 1998; Veenstra et al., 2005; Turcotte et al., 2015). Furthermore, frequent bullying affects the school atmosphere, leading to widespread underachievement, alienation from school, stomachaches and headaches, reluctance to go to school, and frequent absences (Berger, 2007).

Cyberbullying—posting negative comments or derogatory photos of the victim on a website—has become increasingly common. The increase in use of cell phones, text mes-

# Window on the world

## BULLYING ACROSS THE WORLD

Bullying is the use of power and aggression to control, cause distress to, or harm someone or destroy property, and can include nonphysical acts such as name-calling, spreading rumors, and taunting. Almost 1 in 3 children worldwide reports being bullied at school at least once in the previous month (UNESCO, 2019).

A global status report examined bullying prevalence rates across 145 countries. Bullying was experienced at some point by over 90 percent of all children in all but two countries: Tajikstan and South Korea. The highest rates of bullying were found in Bostwana and Ghana, where, respectively, 81 and 78 percent of children reported the occurrence of bullying at least once a month. (Richardson & Hiu, 2018).

Bullying occurs regardless of whether a country is wealthy or poor. However, within countries, the socio-economic status of children is a factor, and poor children are more likely to be bullied than those from wealthier families. Additionally, immigrant children are at higher risk, as are children perceived to be “different” in any way, including children of different races or those who are gender-nonconforming or perceived as LGBTQ+. Overall, boys are slightly more at risk for

bullying; however, in countries with a very high incidence of bullying, girls are disproportionately targeted (UNESCO, 2019).

Just as in the United States, research shows that children may suffer negative social, behavioral, and psychological outcomes as a result of bullying. Moreover, cross-cultural research conducted with adults in 30 European countries indicated that those adults who had been bullied as children showed lower life satisfaction (29 percent) than those who had not been bullied (40 percent) (UNESCO, 2017). Thus, both the immediate negative consequences and the long-term effects of bullying make it an issue worthy of attention. Health promotion and prevention strategies need to address bullying problems to make the world safer for all.



Although the wealth of a country does not seem to account for bullying prevalence rates, what other country-level variables might help us understand bullying? What types of cultural beliefs might influence bullying?

saging, email, and social media has opened new venues for bullies that provide access to victims without the protection of family and community. Estimates for prevalence rates vary widely, ranging from 10 percent to 40 percent (Kowalski, et al., 2014), with higher rates reported for the United States (Selkie et al., 2016) than Europe (Brochado et al., 2017). There are also age-related changes in the likelihood of cyberbullying. The yearly prevalence of cyberbullying is initially relatively low in primary public school students (5 percent), although it increases with age and peaks in middle school students at 33 percent before declining slightly in high school (Centers for Disease Control and Prevention, 2021).

Research suggests that cyberbullying is often an extension of face-to-face bullying, as cyberbullies also tend to engage in aggressive acts in person as well as online (Modecki et al., 2014; Kowalski et al., 2014). Cyberbullies tend to believe that aggression is normative and show low empathy for others (Kowalski et al., 2014). While overall, boys cyberbully at higher levels than do girls, girls engage in more cyberbullying in early to middle adolescence, whereas boys' cyberbullying peaks somewhat later (Barlett & Coyne, 2014). Being a victim of cyberbullying is associated with a wealth of mental health and academic issues, and, for some children, an elevated risk of suicidal ideation and suicide (Van Geel et al., 2014).

Given the high public health and individual psychological costs of bullying, intervention programs have been developed as a means by which to combat bullying. Such programs generally aim to increase school staff and student awareness of and response to bullying, to teach students social and emotional skills, and to foster socially respon-

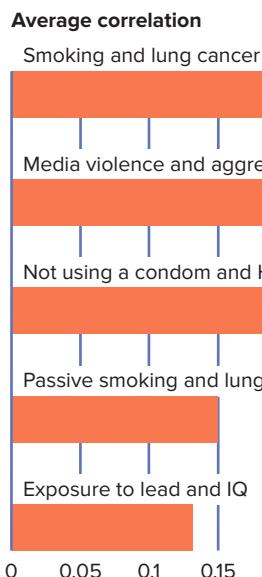
sible beliefs. Meta-analyses indicate such programs reduce bullying perpetration and victimization by approximately 15 to 20 percent, although their effectiveness varies widely (Gafney et al., 2019). Generally, programs are more effective at reducing physical and relational bullying and less effective with verbal forms of bullying, have stronger effects in boys than girls, and are more effective when implemented outside of the United States (Kennedy, 2020; Kennedy, 2020). Sometimes bullying intervention programs may be directed at parents, and such parenting programs have also been shown to reduce both bullying and victimization (Chen et al., 2020).

**The Influence of Media Violence on Aggression** On average, children spend more than 7 hours a day in front of a television or computer screen (Anderson et al., 2015). Violence is prevalent in US media. About 6 out of 10 television programs portray violence, usually glamorized, glorified, or trivialized (Yokota & Thompson, 2000). In one study, even in shows rated for children 7 years of age and younger, violence was featured in over 70 percent of episodes (Gabrielli et al., 2016). Music videos are another influence, with approximately 15 percent of music videos featuring physical aggression (Smith & Boyson, 2002) and disproportionately featuring violence against women and African-Americans. The motion picture, music, and video game industries also aggressively market violent, adult-rated products to children (AAP Committee on Public Education, 2001). In a study of US children, 40 movies that were rated R for violence were seen by a median of 12.5 percent of an estimated 22 million children aged 10 to 14 (Worth et al., 2008).

Evidence from research conducted over the past 50 years on exposure to violence in TV shows, movies, and video games supports a causal relationship between media violence and violent behavior on the viewer's part (Anderson et al., 2015). Although the strongest single correlate of violent behavior is previous exposure to violence (AAP Committee on Public Education, 2001; Anderson et al., 2003), the effect of exposure to violence via mass media is significant (Figure 2). Moreover, cross-cultural research has shown that the positive relationship between violent media exposure and increases in aggressive behavior holds across different cultures (Anderson et al., 2017; Anderson et al., 2010).

In the short term, exposure to violent media content leads to increases in aggressive behavior, speech, thoughts, and emotions. Over the long term, exposure to violent media results in a higher risk of physical assault and spousal abuse, robbery, and gang entry. Media violence is believed to exert its effects via observational learning, desensitization, and enactive learning that occurs automatically in children (Anderson et al., 2015; Anderson et al., 2003). Children who see characters use violence to achieve their goals are likely to conclude that force is an effective way to resolve conflicts. Media provides visceral thrills without showing the human cost, leads children to view aggression as acceptable, and desensitizes them to violence. Violent media also decrease empathy and prosocial behavior (Anderson et al., 2017). Children who are aggressive to start with fare worse as highly aggressive children are more strongly affected by media violence than are less aggressive children (Anderson et al., 2003).

Approximately 92 percent of American children play video games (Gentile, 2011). Some psychologists have argued that long-term increases in violent behavior could be even greater for video games than for TV and movies. Players of violent games are active participants who receive positive reinforcement for violent actions (Huesmann, 2007). Cross-cultural research has shown violent video game players show less prosocial behavior and empathy and more aggressive behaviors, feelings and thoughts, physiological arousal and stress response, hostile appraisals, and desensitization to violence, and they are more likely to respond violently to provocation (Anderson et al., 2017; Ferguson, 2015; Gentile et al., 2017).



**FIGURE 2**

### Effects of Threats to Public Health

*The effect of media violence is the same or greater than the effect of many other recognized threats to public health.*

Source: Bushman & Huesmann (2001).

Although the majority of researchers endorse the association between video game violence and aggression (Bushman et al., 2015), others believe this link may be overstated (Ferguson, 2013). For example, they argue that methodological flaws such as a failure to consider confounding variables, difficulty generalizing from laboratory studies of aggression to real-world aggressive acts, and inappropriate statistical modeling call into question some of the claims (Ferguson & Savage, 2012). Moreover, researchers have also pointed out that media violence is just one of many factors, and perhaps not even the most important one (Bushman et al., 2016). In support of these assertions are data indicating that youth violence has declined even though exposure to violent media has remained stable (Ferguson, 2013) and that video game consumption is inversely related to youth violence (Ferguson, 2015).

Recent experimental evidence casts even greater doubt on the existence of a direct causal relationship between the electronically mediated aggression in video games and aggression in the real world. In this study, 275 male undergraduates played one of two video games. One version was a violent first-person shooter game, the second a closely matched nonviolent version in which booger monsters needed to be sent back to their home dimension. Following the game, participants were provoked in real life by a confederate and given the chance to respond aggressively. The researchers did not find an effect for video game violence. In other words, violence within the context of the video game did not translate, at least in the short term, into real-world behavior (Hilgard et al., 2019).

However, this does not mean that children should be allowed to watch violent content without limits or that modeling of aggression across all media has no effects. Media-induced aggressiveness can be minimized by cutting down on television use and by parental monitoring and guidance of the shows children watch (Anderson et al., 2003). Additionally, just as viewing violent media promotes aggression, viewing media that promotes messages of empathy and helping promotes prosocial behavior in children (Anderson et al., 2015).

**Outcomes of Aggression** Generally, aggression is associated with worse outcomes. Aggressive children tend to have social and psychological problems, but it is not clear whether aggression causes these problems or is a response to them, or both (Crick & Grotpeter, 1995). For example, overt aggression in boys and relational aggression in girls are both related to social problems with peers (Preddy & Fite, 2012). Not surprisingly, school-age boys who are physically aggressive may become juvenile delinquents in adolescence (Hay et al., 2017). Children who are high in both physical aggression and indirect relational aggression are at higher risk for depression, delinquency, and narcissism in early adulthood (Cleverley et al., 2012; Ehrenreich et al., 2016).

Adults can help children curb aggression by teaching them how to recognize when they are getting angry and how to control their anger. Research has shown interventions generally have a modest effect and are most influential when delivered to all children and for those children at higher risk (Barnes et al., 2014; Wilson et al., 2003).



*Some research shows that children who see televised violence tend to act aggressively. When the violence is child-initiated, as in video games, the effect may be even stronger.*

Andrey Popov/Shutterstock



*What can and should be done about children's exposure to media violence?*

## checkpoint can you . . .

- Tell how aggression changes during middle childhood and how social information processing and media violence can contribute to it?
- Describe how patterns of bullying and victimization become established and change?

# Mental Health

Although many people believe young children do not experience mental health issues, in reality, they can suffer from a variety of disruptive conduct disorders, anxiety disorders, and depression.

## COMMON EMOTIONAL PROBLEMS

Approximately 56 percent of children diagnosed with emotional, behavioral and developmental problems have disruptive conduct disorders: aggression, defiance, or antisocial

Paraplush,  
a European toy  
company, has released  
a line of plush animals  
illustrating common  
psychological disorders.  
Their tagline is "Psychiatry  
for Abused Toys."  
The animals include  
a hallucinating snake,  
a depressed turtle,  
a paranoid crocodile, and  
others. Do you think this  
approach helps destigmatize  
mental disorders, or does it  
promote negative  
stereotypes and inaccurate  
perceptions?



behavior. Almost all the rest, 43.5 percent, have anxiety or mood disorders: feeling sad, depressed, unloved, nervous, fearful, or lonely (Bethell et al., 2005).

**Disruptive Conduct Disorders** Temper tantrums and defiant, argumentative, hostile, or deliberately annoying behavior typically are outgrown by middle childhood as children get better at controlling these behaviors. When such a pattern of behavior persists until age 8, children (usually boys) may be diagnosed with **oppositional defiant disorder (ODD)**, a pattern of defiance, disobedience, and hostility toward adult authority figures lasting at least 6 months and going beyond the bounds of normal childhood behavior. Children with ODD constantly fight, argue, lose their temper, snatch things, blame others, and are angry and resentful. They have few friends, are in constant trouble in school, and test the limits of adults' patience (Matthys & John, 2017).

Some children with ODD may later be diagnosed with **conduct disorder (CD)**, a persistent, repetitive pattern, beginning at an early age, of aggressive, antisocial acts, such as truancy, setting fires, habitual lying, fighting, bullying, theft, vandalism, assaults, and drug and alcohol use (Matthys & John, 2017). About 7.4 percent of American children age 3 to 17 years have conduct disorder, with boys (10.1 percent) at higher risk than girls (4.5 percent) (Ghandour et al., 2019). Conduct disorder in childhood is strongly predictive of antisocial and criminal behavior in adulthood (Mordre et al., 2011).

There are indications that children with conduct disorders have neurological deficits that affect their ability to feel empathy for others, leading to a characteristic callous unemotionality (Lockwood et al., 2013; Michalska et al., 2016). Children who are at elevated risk of becoming antisocial adults also tend to be impulsive and have low IQ and poor academic achievement (Murray & Farrington, 2010). They also tend to experience substandard parenting. Their parents may not supervise them well, or they may be overly punitive or erratic in their care. They may be cold or antisocial, abusive, use hostile parenting strategies, or have high levels of family conflict (van Goozen, et al. 2007; Miner & Clarke-Stewart, 2009). Their families are more likely to be large or poor. Additionally, children who later become antisocial are more likely to have antisocial peers, to go to schools with high delinquency rates, and to live in high-crime neighborhoods. These risk factors are additive: the more of them present, the higher the risk (Murray & Farrington, 2010).

**Anxiety Disorders** About 7.1 percent of children aged 3 to 17 have an anxiety disorder, with slightly more girls (7.3 percent) than boys (6.9 percent) diagnosed. One in 3 of children with an anxiety disorder also suffers from depression (Ghandour et al., 2019).

Although separation anxiety is normal in infancy, it is cause for concern when it persists in older children. **Separation anxiety disorder** involves excessive anxiety for at least 4 weeks concerning separation from home or from attachment figures. It affects some 4 percent of children and young adolescents. These children often come from close-knit, caring families. They may develop the disorder spontaneously or after a stressful event (American Psychiatric Association, 2000; Harvard Medical School, 2004).

Children with **school phobia** have an unrealistic fear of going to school. Sometimes school phobia may be a form of **social phobia**, or social anxiety: extreme fear and/or avoidance of social situations such as speaking in class or meeting an acquaintance on the street. Social phobia affects about 5 percent of children;. Traumatic experiences, such as a child's mind going blank after being called on in class or while writing on the chalkboard, often trigger these phobias (Rao et al., 2007).

Some children have a **generalized anxiety disorder**, not focused on any specific part of their lives. These children worry about just about everything: school grades, storms, earthquakes, and hurting themselves on the playground. They tend to be self-conscious, self-doubting, and excessively concerned with meeting the expectations of others. They seek approval and need constant reassurance, but their worry seems independent of performance or of how they are regarded by others (Harvard Medical School, 2004; USDHHS, 1999).

Far less common is **obsessive-compulsive disorder (OCD)**. Children with this disorder may be obsessed by repetitive, intrusive thoughts, images, or impulses (often involving irrational fears); may show compulsive behaviors, such as constant hand-washing; or both (Harvard Medical School, 2004).

#### obsessive-compulsive disorder (OCD)

Anxiety aroused by repetitive, intrusive thoughts, images, or impulses, often leading to compulsive ritual behaviors.

**Childhood Depression** **Childhood depression** is a disorder of mood that goes beyond normal, temporary sadness. A meta-analysis including 41 studies across 27 cultures estimated the prevalence of childhood and adolescent depressive disorders at 2.6 percent (Polanczyk et al., 2015). In the United States, depression is estimated to occur in approximately 3.2 percent of children. As with anxiety disorders, girls (3.3 percent) are slightly more likely to be affected than boys (3 percent) (Ghandour et al., 2019), and depression becomes proportionately more common in girls with age (Perou et al., 2013).

Symptoms of depression include inability to have fun or concentrate, fatigue, extreme activity or apathy, crying, sleep problems, weight change, physical complaints, feelings of worthlessness, a prolonged sense of friendlessness, or frequent thoughts about death or suicide. Childhood depression may signal the beginning of a recurrent problem that is likely to persist into adulthood (Kovacs et al., 2016).

Depressed children tend to come from families with high levels of parental depression, anxiety, substance abuse, or antisocial behavior. The children themselves are also frequently anxious and have poor impulse control and poor peer relationships (Bufferd et al., 2014). Genetics are also important, given the existence of gene variants that increase the risk of depression (Dunn et al., 2015).

**The Influence of COVID-19 on Child Mental Health** Worldwide, the prevalence rate of mental disorders in children and adolescents had been estimated to be approximately 13.4 percent (Polanczyk et al., 2015). The advent of the novel coronavirus COVID-19 might be expected to influence this number. In many countries, the pandemic led to widespread lockdowns. Families were asked to isolate in their homes, and businesses were shuttered. Some children experienced the hospitalization or death of loved ones, or were themselves hospitalized. The coronavirus also led to the closing of schools, with approximately 80 percent of school-aged children across the globe affected (Van Lancker & Parolin, 2020).

Early research emerging from countries most strongly affected initially by COVID-19 illustrates the influence of the pandemic on children. For example, children in China, Italy, and Spain subjected to quarantine were more likely to have difficulty concentrating and be fearful, anxious, clingy, agitated, restless, and lonely. Moreover, there were also behavioral changes. Children were less likely to be active. They also increased their screen time and slept more hours, although their sleep was more likely to be of poor quality (Orgilés et al., 2020; Jiao et al., 2020). In many cases, children were separated from ill parents or quarantined away from their families if they were found to be positive for COVID-19. Forced separation from parents is profoundly damaging to children. In the short term, it can result in the development of posttraumatic stress disorder (Rojas-Flores et al., 2017). In the long term, forced separation can result in lifelong negative effects on physical and mental health (Putnam et al., 2013).

Parents can help their children manage their stress and anxiety by talking to them about COVID-19 in simple, concrete terms they can understand. A regular routine with a variety of indoor activities is also helpful. Allowing children the opportunity to maintain ties with peers electronically is also important, although monitoring their consumption of electronic media is advised so they do not gain access to false or frightening information. Counseling or therapy may also be needed for some children (Bahn, 2020).

#### childhood depression

Mood disorder characterized by such symptoms as a prolonged sense of friendlessness, inability to have fun or concentrate, fatigue, extreme activity or apathy, feelings of worthlessness, weight change, physical complaints, and thoughts of death or suicide.



*In play therapy, the therapist observes as a child acts out troubled feelings, often using developmentally appropriate materials such as dolls or toys.*  
Photographer: Shutterstock

## TREATMENT TECHNIQUES

Only about half of all children in the United States who need services for mental health issues currently receive the help they need (Merikangas

#### **individual psychotherapy**

Psychological treatment in which a therapist sees a troubled person one-on-one.

#### **family therapy**

Psychological treatment in which a therapist sees the whole family together to analyze patterns of family functioning.

#### **behavior therapy**

Therapeutic approach using principles of learning theory to encourage desired behaviors or eliminate undesired ones; also called *behavior modification*.

#### **art therapy**

Therapeutic approach that allows a person to express troubled feelings without words, using a variety of art materials and media.

#### **play therapy**

Therapeutic approach that uses play to help a child cope with emotional distress.

#### **drug therapy**

Administration of drugs to treat emotional disorders.

et al., 2010). Estimates for the prevalence rate in the United States range from 13 to 20 percent, with rates on the increase (Perou et al., 2013).

Psychological treatment for emotional disturbances can take several forms. In **individual psychotherapy**, a therapist sees a child one-on-one to help the child gain insights into his or her personality and relationships and to interpret feelings and behavior. Such treatment may be helpful at stressful times, such as the death of a parent or parental divorce. In **family therapy**, the therapist sees the family together, observes how members interact, and points out both growth-producing and growth-inhibiting or destructive patterns of family functioning.

**Behavior therapy**, or behavior modification, is a form of psychotherapy that uses principles of learning theory to eliminate undesirable behaviors or to develop desirable ones. Results are best when treatment is targeted to specific problems and desired outcomes (Weisz et al., 1995). Cognitive behavioral therapy, which seeks to change negative thoughts through gradual exposure, modeling, rewards, or talking to oneself, has been shown to be the most effective treatment for anxiety disorders in children and adolescents (Hofmann et al., 2012).

When children have limited verbal and conceptual skills or have suffered emotional trauma, **art therapy** can help them describe what is troubling them without the need to put their feelings into words. The child may express deep emotions through his or her choice of colors and subjects to depict. Art therapy has been demonstrated to be beneficial and is often used in conjunction with other forms of therapy (Slayton et al., 2010). **Play therapy**, in which a child plays freely while a therapist occasionally comments, asks questions, or makes suggestions, has also been demonstrated to be effective for a variety of emotional, cognitive, and social problems, especially when consultation with parents or other close family members is part of the process (Lin & Bratton, 2015; Ray et al., 2015).

The use of **drug therapy**—antidepressants, stimulants, tranquilizers, or antipsychotic medications—to treat childhood emotional disorders is controversial. During the past 2 decades, the rate at which antipsychotic medications are prescribed for children and adolescents has risen sharply and at a faster rate than for adults (Olfson et al., 2014). For example, from 1999 to 2001, approximately 1 in 650 children was receiving antipsychotic medications; this number rose to 1 in 329 for 2007 (Olfson et al., 2010). Sufficient research on the effectiveness and safety of many of these drugs for children is lacking.

### **checkpoint** can you . . .

- Discuss causes, symptoms, and treatments of common emotional disorders?

#### **resilient children**

Children who weather adverse circumstances, function well despite challenges or threats, or bounce back from traumatic events.

#### **protective factors**

Influences that reduce the impact of potentially negative influences and tend to predict positive outcomes.

## **RESILIENCE**

**Resilient children** are those who weather circumstances that might blight others, who maintain their composure and competence under challenge or threat, or who bounce back from traumatic events.

The two most important **protective factors** that help children and adolescents overcome stress and contribute to resilience are good family relationships and cognitive functioning (Masten & Coatsworth, 1998). Other frequently cited protective factors include the following (Ackerman et al., 1999; Eisenberg et al., 2004; Masten & Coatsworth, 1998; Werner, 1993):

- The child's temperament or personality: Resilient children are adaptable, friendly, well liked, independent, and sensitive to others. They are competent and have high self-esteem. When under stress, they can regulate their emotions by shifting attention to something else.
- Compensating experiences: A supportive school environment or successful experiences in studies, sports, or music, or with other children or adults can help make up for a destructive home life.
- Reduced risk: Children who have been exposed to only one of a number of factors for psychiatric disorder (such as parental discord, a disturbed mother, a criminal father, and experience in foster care) are often better able to overcome stress than children who have been exposed to more than one risk factor.

In general, children with unfavorable backgrounds have more adjustment problems than children with more favorable backgrounds. Still, what is heartening about these findings is that negative childhood experiences do not necessarily determine the outcome of a person's life and that many children have the strength to rise above the most difficult circumstances.



- Name the most common sources of fear, stress, and anxiety in children?
- Identify protective factors that contribute to resilience?

## summary and key terms

### The Developing Self

- The self-concept becomes more realistic during middle childhood, when, according to a neo-Piagetian model, children form representational systems.
- According to Erikson, the chief source of self-esteem is children's view of their productive competence. This virtue develops through resolution of the fourth psychosocial conflict, industry versus inferiority.
- School-age children have internalized shame and pride and can better understand and regulate negative emotions.
- Empathy and prosocial behavior increase.
- Emotional growth is affected by parents' reactions to displays of negative emotions.
- Emotional regulation involves effortful control.  
**representational systems** (293)  
**industry versus inferiority** (293)

### The Child in the Family

- School-age children spend less time with parents and are less close to them than before, but relationships with parents continue to be important. Culture influences family relationships and roles.
- The family environment has two major components: family structure and family atmosphere.
- The emotional tone of the home, the way parents handle disciplinary issues and conflict, the effects of parents' work, and the adequacy of financial resources all contribute to family atmosphere.
- Development of coregulation may affect the way a family handles conflicts and discipline.
- The impact of mothers' employment depends on many factors concerning the child, the mother's work and her feelings about it, whether she has a supportive partner, the family's socioeconomic status, and the type of care and degree of monitoring the child receives.
- Poverty can harm children's development indirectly through its effects on parents' well-being and parenting practices.

- Many children today grow up in nontraditional family structures. Other things being equal, children tend to do better in traditional two-parent families than in cohabiting, divorced, single-parent, or stepfamilies. The structure of the family, however, is less important than its effects on family atmosphere.
- Children's adjustment to divorce depends on factors concerning the child, the parents' handling of the situation, custody and visitation arrangements, financial circumstances, contact with the noncustodial parent (usually the father), and a parent's remarriage.
- The amount of conflict in a marriage and the likelihood of its continuing after divorce may influence whether children are better off if the parents stay together.
- In most divorces, the mother gets custody, though paternal custody is a growing trend. Quality of contact with a noncustodial father is more important than frequency of contact.
- Joint custody can be beneficial to children when the parents can cooperate. Joint legal custody is more common than joint physical custody.
- Although parental divorce increases the risk of long-term problems for children, most adjust reasonably well.
- Children living with only one parent are at heightened risk of behavioral and academic problems, largely related to socioeconomic status.
- Studies have found positive developmental outcomes in children living with gay or lesbian parents.
- Adopted children are generally well adjusted, though they face special challenges.
- The roles and responsibilities of siblings in nonindustrialized societies are more structured than in industrialized societies.
- Siblings learn about conflict resolution from their relationships with each other. Relationships with parents affect sibling relationships.

**coregulation** (296)

**internalizing behaviors** (298)

**externalizing behaviors** (298)

## The Child in the Peer Group

- The peer group becomes more important in middle childhood. Peer groups generally consist of children who are similar in age, sex, ethnicity, and socioeconomic status and who live near one another or go to school together.
- The peer group helps children develop social skills, allows them to test and adopt values independent of parents, gives them a sense of belonging, and helps develop their self-concept and gender identity. It also may encourage conformity and prejudice.
- Popularity in middle childhood tends to influence future adjustment. It can be measured sociometrically or by perceived social status, and the results may differ. Popular children tend to have good cognitive abilities and social skills. Behaviors that affect popularity may be derived from family relationships and cultural values.

- Intimacy and stability of friendships increase during middle childhood. Boys tend to have more friends, whereas girls tend to have closer friends.
- During middle childhood, aggression typically declines. Instrumental aggression generally gives way to hostile aggression, often with a hostile bias. Highly aggressive children tend to be unpopular but may gain in status as children move into adolescence.
- Aggressiveness is promoted by exposure to media violence and can extend into adult life.
- Middle childhood is a prime time for bullying, but patterns of bullying and victimization may be established much earlier. Victims tend to be weak and submissive or argumentative and provocative and to have low self-esteem.

**prejudice** (307)

**hostile attribution bias** (309)

**bullying** (310)

## Mental Health

- Common emotional and behavioral disorders among school-age children include disruptive behavioral disorders, anxiety disorders, and childhood depression.
- Treatment techniques include individual psychotherapy, family therapy, behavior therapy, art therapy, play therapy, and drug therapy. Often therapies are used in combination.
- Resilient children are better able than others to withstand stress. Protective factors involve family relationships, cognitive ability, personality, degree of risk, and compensating experiences.  
**oppositional defiant disorder (ODD)** (314)  
**conduct disorder (CD)** (314)  
**separation anxiety disorder** (314)

**school phobia** (314)  
**social phobia** (314)  
**generalized anxiety disorder** (314)  
**obsessive-compulsive disorder (OCD)** (315)  
**childhood depression** (315)  
**individual psychotherapy** (316)  
**family therapy** (316)  
**behavior therapy** (316)  
**art therapy** (316)  
**play therapy** (316)  
**drug therapy** (316)  
**resilient children** (316)  
**protective factors** (316)

## outline

Adolescence

### PHYSICAL DEVELOPMENT

Puberty

The Adolescent Brain

Physical and Mental Health

### COGNITIVE DEVELOPMENT

Aspects of Cognitive Maturity

Educational and Vocational Issues

## learning objectives

Discuss the nature of adolescence.

Describe the changes involved in puberty, as well as the changes in the adolescent brain.

Identify adolescent problems related to health.

Explain cognitive changes in adolescence.

Summarize key aspects of how schools influence adolescent development.

# Physical and Cognitive Development in Adolescence



kupicoo/E+/Getty Images

## did you know?

- About 40 percent of US adolescents have tried illegal drugs by the time they leave high school.
- Depression in young people sometimes looks like irritation or boredom.
- Participation in after-school activities is associated with academic achievement.

*In this chapter, we describe the physical transformations of adolescence and how they affect young people's feelings. We look at the not-yet-mature adolescent brain and discuss health issues associated with this time of life. We examine the Piagetian stage of formal operations and linguistic and moral development. Finally, we explore educational and vocational issues.*



**L**ife would be infinitely happier if we could only be born at the age of 80 and gradually approach 18.

—Mark Twain (1835–1910)

## Adolescence

This chapter focuses on processes that occur in the long period known as **adolescence**—a developmental transition that involves physical, cognitive, emotional, and social changes and takes varying forms in different social, cultural, and economic settings. In this book, we define adolescence roughly as encompassing the years between 11 and 19 or 20.

### adolescence

Developmental transition between childhood and adulthood entailing major physical, cognitive, and psychosocial changes.

### ADOLESCENCE AS A SOCIAL CONSTRUCTION

Adolescence is a social construction. In preindustrial societies, children entered the adult world when they matured physically or when they began a vocational apprenticeship. Adolescence was not defined as a separate stage of life in the Western world until the twentieth century. Today, adolescence is a global concept, though it may take different forms in different cultures. In most parts of the world, entry into adulthood takes longer and is less clear-cut than in the past. Puberty generally begins earlier, which means the period of adolescence begins at a younger age than in the past. In addition, as the world becomes more driven by technology and information, the amount of training required for higher-paying occupations has increased. Because of this, the period of adolescence has been extended upward as young adults tend to go to school for more years, delay marriage and childbirth, and settle into permanent careers later and less firmly than in the past.

### checkpoint can you . . .

- Point out cultural and historical changes in the understanding of adolescence?

## PHYSICAL DEVELOPMENT

### Puberty

**Puberty** involves dramatic biological changes. These changes are part of a long, complex process of maturation that begins even before birth, and their psychological ramifications may continue into adulthood.

### puberty

Process by which a person attains sexual maturity and the ability to reproduce.

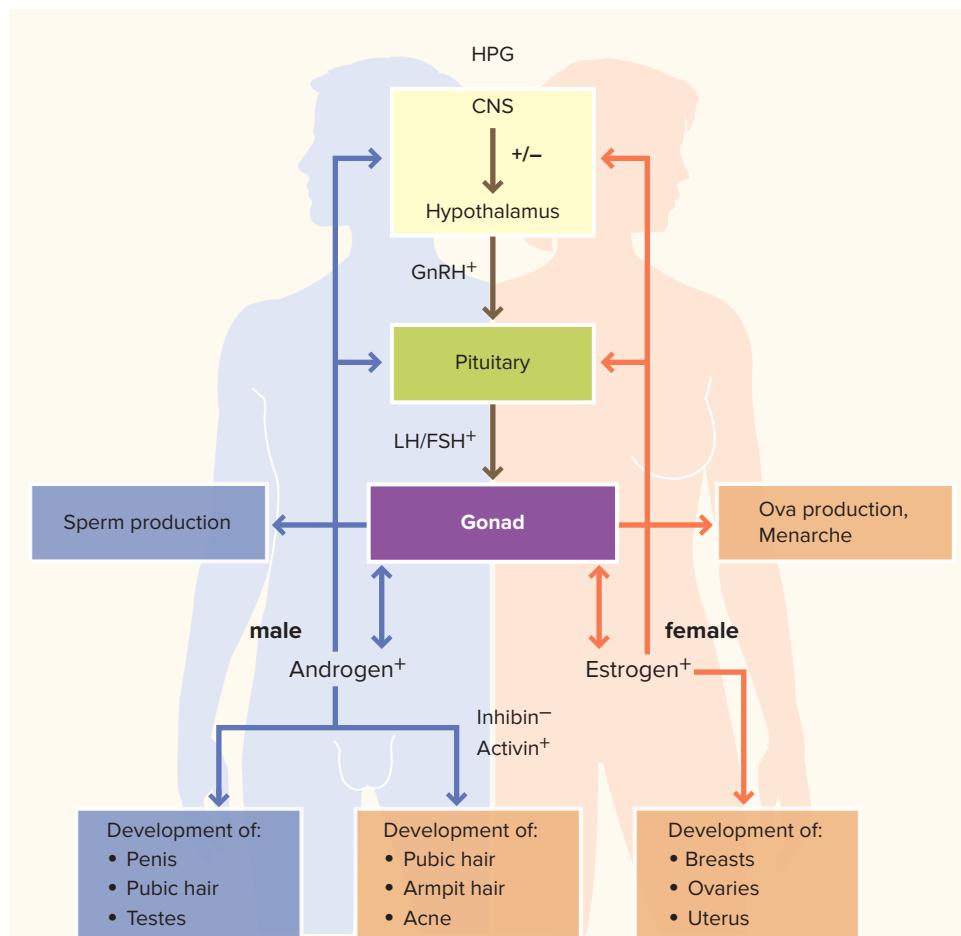
### HORMONAL CHANGES IN PUBERTY

The advent of puberty is not caused by any single factor. Rather, puberty results from a cascade of hormonal responses (Figure 1). First, the hypothalamus releases elevated levels of gonadotropin releasing hormone (GnRH). The increased GnRH then triggers a rise in lutenizing hormone (LH) and follicle-stimulating hormone (FSH). These hormones exert their actions differentially on boys and girls. In girls, increased levels of FSH lead to the onset of menstruation. In boys, LH initiates the release of two additional hormones: testosterone and androstendione (Buck et al., 2008).

**FIGURE 1**

## Regulation of Human Puberty Onset and Progression

HPG (hypothalamuspituitary-gonadal) activation requires a signal from the central nervous system (CNS) to the hypothalamus, which stimulates the production of LH and FSH from the pituitary.



Source: American Academy of Pediatrics.

Puberty can be broken down into two basic stages: adrenarche and gonadarche. Adrenarche occurs between ages 6 and 8. During this stage, the adrenal glands secrete increasing levels of androgens, most notably dehydroepiandrosterone (DHEA) (Susman & Rogol, 2004). Levels increase gradually but consistently, and by the time a child is 10 years of age, the levels of DHEA are 10 times what they were between ages 1 and 4. DHEA influences the growth of pubic, axillary (underarm), and facial hair. It also contributes to faster body growth, oilier skin, and the development of body odor.

The second stage, gonadarche, is marked by the maturing of the sex organs, which triggers a second burst of DHEA production (McClintock & Herdt, 1996). During this time, a girl's ovaries increase their input of estrogen, which in turn stimulates the growth of female genitals, breasts, and the development of pubic and underarm hair. In boys, the testes increase the production of androgens, especially testosterone. This increase leads to the growth of male genitals, muscle mass, and body hair.

## PUBERTY AND SEXUAL MATURITY

Changes that herald puberty typically begin at age 8 in girls and age 9 in boys (Susman & Rogol, 2004), but a wide range of ages exists for various changes.

### primary sex characteristics

Organs directly related to reproduction, which enlarge and mature during adolescence.

**Primary and Secondary Sex Characteristics** The **primary sex characteristics** are the organs necessary for reproduction. In the female, the sex organs include the ovaries, fallopian tubes, uterus, clitoris, and vagina. In the male, they include the testes, penis, scrotum, seminal vesicles, and prostate gland. During puberty, these organs enlarge and mature.

The **secondary sex characteristics** are physiological signs of sexual maturation that do not directly involve the sex organs; for example, the breasts of females and the broad shoulders of males. Other secondary sex characteristics are changes in the voice and skin texture, muscular development, and the growth of pubic, facial, axillary, and body hair.

**secondary sex characteristics**  
Physiological signs of sexual maturation (such as breast development and growth of body hair) that do not involve the sex organs.

**Signs of Puberty** The first external signs of puberty typically are breast tissue and pubic hair in girls and enlargement of the testes in boys (Susman & Rogol, 2004). A girl's nipples enlarge and protrude, the areolae (the pigmented areas surrounding the nipples) enlarge, and the breasts assume first a conical and then a rounded shape. Some adolescent boys, much to their distress, experience temporary breast enlargement; this development is normal and generally does not last longer than 18 months.

Pubic hair, at first straight and silky, eventually becomes coarse, dark, and curly. It appears in different patterns in males and females. Adolescent boys are usually happy to see hair on the face and chest, but girls are generally dismayed at the appearance of even a slight amount of hair on the face or around the nipples, though this, too, is normal.

The voice deepens, especially in boys, partly in response to the growth of the larynx and partly in response to the production of male hormones. The skin becomes coarser and oilier, giving rise to pimples and blackheads. Acne is more common in boys and seems related to increased amounts of testosterone.

Overall, the pubertal transition generally takes about 3 to 4 years. Teens must adjust their understanding of themselves and their bodies in the face of these changes (Research in Action).

**The Adolescent Growth Spurt** The **adolescent growth spurt**—a rapid increase in height, weight, and muscle and bone growth that occurs during puberty—generally begins in girls between ages 9½ and 14½ (usually at about 10) and in boys between 10½ and 16 (usually at 12 or 13). It typically lasts about 2 years. Soon after it ends, the young person reaches sexual maturity. Both growth hormone and the sex hormones (androgens and estrogen) contribute to this normal pubertal growth pattern (Susman & Rogol, 2004).

Because girls' growth spurt usually occurs 2 years earlier than that of boys, girls between ages 11 and 13 tend to be taller, heavier, and stronger than boys the same age. After their growth spurt, boys are again larger. Girls typically reach full height at age 15 and boys at age 17 (Gans, 1990).

Boys and girls grow differently, not only in rates of growth but also in form and shape. A boy becomes larger overall: his shoulders wider, his legs longer relative to his trunk, and his forearms longer relative to his upper arms and his height. A girl's pelvis widens to make childbearing easier, and layers of fat accumulate under her skin, giving her a more rounded appearance (Susman & Rogol, 2004).

**Sexual Maturity** The maturation of the reproductive organs brings the beginning of menstruation in girls and the production of sperm in boys. The principal sign of sexual maturity in boys is the production of sperm. The first ejaculation, or **spermarche**, occurs at an average age of 13. A boy may wake up to find a wet spot or a hardened, dried spot on the sheets—the result of a nocturnal emission, an involuntary ejaculation of semen (commonly referred to as a wet dream).

The principal sign of sexual maturity in girls is menstruation, a monthly shedding of tissue from the lining of the womb. The first menstruation, called **menarche**, occurs fairly late in the sequence of female development;

**adolescent growth spurt**  
Sharp increase in height and weight that precedes sexual maturity.

**spermarche**  
Boy's first ejaculation.

**menarche**  
Girl's first menstruation.



*Most girls experience a growth spurt 2 years earlier than most boys, so between ages 11 and 13, girls tend to be taller, heavier, and stronger than boys the same age.*

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# research in action

## WHO ARE YOU? PUBERTY AND LGBTQ+ IDENTITY DEVELOPMENT

Halima, Abigail, and Marquitta huddle under their blankets at a sleepover a few weeks into 7th grade. Giggling, Abigail admits to a crush on Jared, a boy in their class. “He’s just so hot,” she says, “like I can’t even think of what to say when I’m around him.” Marquitta stays quiet, looking down and away from her friends. Halima, noticing, pats her friend on the shoulder. “Is something wrong? she asks. Marquitta takes a deep breath. “I don’t know,” she says. “It’s just...I think maybe I don’t like boys in the same way you guys do. I think maybe I might be gay. I don’t know what I am. But I’m pretty sure I’m not straight.”

During puberty, adolescents’ brains and bodies are changing and developing rapidly (Araia et al., 2013). Sexual maturation is a part of this process and consists of both physical and cognitive changes, including, importantly, becoming romantically or sexually attracted to people for the first time (Wheeler, 1991). Teenagers often start to develop crushes on other people and may begin dating.

Approximately 60 percent of LGBTQ+ adults report that they first realized that they were LGBTQ+ during or slightly after puberty, at a median age of about 12 years (Lopez, 2013). Generally, teens first begin to question their sexuality in early adolescence. Similarly to their heterosexual peers, they also tend to experience their first sexual attraction at approximately 12.7 years of age. During late adolescence, LGBTQ+ youth are more likely to begin self-identifying as a sexual minority or engaging in a romantic relationship. Some time later, at an average age of slightly over 18 years, LGBTQ+ teens have their first sexual contact (Hall et al., 2021).

Teenagers who realize they are not attracted to, or are not only attracted to, people of the opposite gen-

der may start to feel different than their peers. This feeling of being different can be particularly confusing or upsetting for LGBTQ+ teens. Sexual- or gender-minority adolescents may hear messages from society, family, teachers, or friends about who they are supposed to be attracted to and begin to feel shame or try to hide who they are (Hanckel, et al., 2019; Munro et al., 2019; Newcomb & Mustanski, 2010).

Unfortunately, many adolescents questioning their sexuality are not able to access the support they need. For instance, LGBTQ+ youth who are unable to establish peer groups that share their sexual orientation may struggle with the recognition of same-sex attractions (Bouchey & Furman, 2003), although the internet has increasingly provided an anonymous and accessible means for young adults to explore their sexuality (Harper et al., 2016). And although most parents eventually accept their children’s sexuality, the coming out process can be difficult, at least initially (Ghosh, 2020). Moreover, only 22 states provide LGBTQ+ material in sex education classes, only 9 of which can be characterized as inclusive (Garg & Volleran, 2021). However, eventually, most teenagers come to accept and understand who they are (Robertson, 2014). It is important to be supportive of our friends and practice allyship to LGBTQ+ people by being a safe person for them to talk to about their feelings and experiences.



What other aspects of the self might be influenced by pubertal development?  
How might this process be altered with a late or early pubertal onset?

its normal timing can vary from age 10 to 16½. The average age of menarche in US girls fell from greater than 14 years before 1900 to the current 12.8 years. While menarche is a significant event, the reproductive system may not yet be functionally mature, as menstrual cycles may occur without ova, especially in very young girls (Eveleth, 2017).

### PUBERTAL TIMING

**Secular Trends in Pubertal Timing** The analysis of adolescent bones from the Bronze age (approximately 3,000 to 1,200 BC), as well as collections of bones from ancient Rome (first to fifth century AD), medieval England (tenth to seventeenth century AD), and a Hispano-Muslim burial site in Spain (eleventh to thirteenth century AD), suggest an altered timeline for pubertal development when these ancient teens are

compared to their modern counterparts (Doe et al., 2019; Arthur et al., 2016; Lewis et al., 2016; Doe et al., 2019). Although the bone evidence suggests puberty in these teens began at roughly similar ages as it does for modern adolescents, puberty, for girls, began somewhat later, and full maturity, for both boys and girls, was reached at later ages.

Multiple studies have indicated that the start of puberty shifted earlier in the twentieth century (Papadimitriou, 2016). Developmental scientists call a pattern such as this a **secular trend**—a trend that spans several generations. The trend, which also involves increases in adult height and weight, began about 100 years ago. It has been extensively documented in such places as the United States, Western Europe, and Japan (Anderson et al., 2003), with better evidence existing for girls than for boys (Papadimitriou, 2016; Euling et al., 2008). The age of puberty has also declined as a whole for China, India, Mexico, and a number of African countries; however, children from different regions or of different ethnicities vary widely in the age at which they hit puberty (Meng et al., 2017; Pathak et al., 2014; Marván et al., 2020; Garenne, 2020). This may not be the only change in pubertal processes; recent research indicates there may be a compensatory delay in pubertal maturation that is associated with earlier puberty. In other words, children may be starting puberty earlier but spending more time to reach full sexual maturity (Papadimitrious, 2016; Mendle, 2014).

**Influences on Pubertal Timing** One set of proposed explanations for the secular trend focuses on environmental factors that influence the pace of pubertal development. One such factor is a higher standard of living. Undernutrition, whether because of insufficient food supply or because of disease, has been associated with delayed onset of puberty and a reduced puberty growth spurt (Soliman et al., 2014). Alternatively, children who are healthier, better nourished, and better cared for might be expected to mature earlier and grow bigger (Slyper, 2006). How much physical exertion children engage in is also an influence, and puberty is delayed in environments in which children engage in high levels of physical activity (Soliman et al., 2014). Cross-cultural research has shown children from less-developed countries tend to be more physically active and less sedentary (Tremblay et al., 2014). Thus, because of both undernutrition and high physical activity level, the average age of sexual maturity tends to be later in developing countries than in developed countries.

In girls, reaching a critical amount of body fat is necessary for successful reproduction. A contributing factor for the shift in pubertal timing in the United States during the last part of the twentieth century may have been the increase in obesity among young girls (Anderson et al., 2003; Lee et al., 2007). Girls with a higher percentage of body fat in early childhood, those who experience unusual weight gain between ages 5 and 9, and overweight or obese girls tend to show earlier pubertal development (Davison et al., 2003; Lee et al., 2007; Li et al., 2017). Increases in leptin, a hormone associated with obesity, appear to play a role in this process (Shalitin & Kiess, 2017), as does kisspeptin, an antecedent hormone to GnRH. The degree of adipose (fat) tissue itself may also matter (Reinehr & Roth, 2019).

Obesity appears to influence pubertal timing differently in boys. However, there is little consistent pattern of influence. Some research indicates obese boys do not exhibit earlier pubertal onset than normal-weight boys (Li et al., 2017). Other research shows obesity is associated with earlier initiation of puberty in boys as it is in girls (Busch et al., 2020). Still other research suggests having a high body mass index in childhood or being obese appears to delay puberty rather than accelerate it (Lee et al., 2010; Wang, 2002). Interestingly, recent research has found that being overweight, rather than either thin or obese, may result in an earlier start to puberty in boys (Lee et al., 2016). More research is needed in this area.

Another explanation focuses on exposure to endocrine-disrupting chemicals, such as those found in some plastics, flame retardants, and pesticides. Research has indicated that exposure to such substances appears to be related to earlier pubertal timing (Lee & Styne, 2013; Özen & Darcan, 2011). Exposure may occur in utero or during childhood and adolescence, most commonly through foods and liquids or the inhalation of dust or sprays (Frye et al., 2012).

#### secular trend

Trend that can be seen only by observing several generations, such as the trend toward earlier attainment of adult height and sexual maturity, which began a century ago in some countries.

*Did you mature early, late, or "on time"? How did you feel about the timing of your maturation?*



## checkpoint can you ...

- Tell how puberty begins and how its timing and length vary?
- Describe typical pubertal changes in boys and girls, and identify factors that affect psychological reactions to these changes?

A variety of social factors also influence when puberty begins. For example, studies on maternal influences have shown that earlier menarche is associated with being the firstborn child (Maisonet et al., 2010), as well as being born to a single mother (Belsky et al., 2007; Ellis et al., 1999), and with harsh maternal parenting practices (Belsky et al., 2010). Fathers also play a role. Girls who have absent, distant, or conflictual relationships with their fathers tend to reach menarche earlier than girls who have close, supportive paternal relationships (Belsky et al., 2007; Mendle et al., 2006; Ellis et al., 1999; Tither & Ellis, 2008). The unifying theme in these influences is stress, which has been proposed to mediate these associations. In other words, it is not being firstborn, or being born to a single mother, or having a conflictual relationship with a father per se that influences puberty; rather, it is the presence or absence of high levels of stress. Those children who are exposed to high stress when young tend to reach pubertal milestones earlier than those who are not (Belsky et al., 2015; Ellis & Del Guiduce, 2014; Bleil et al., 2013).

Genetic factors are also important. Both maternal and paternal pubertal timing are associated with an individual's pubertal timing (Wohlfahrt-Veje et al., 2016). Additionally, twin studies have documented the heritability of age of menarche (Mendle et al., 2006), and further support for genetic influences is illustrated by the finding that the age of a girl's first menstruation tends to be similar to that of her mother's (Maisonet et al., 2010) if nutrition and standards of living remain stable from one generation to the next (Susman & Rogol, 2004).

Another factor that influences timing of pubertal development is race and ethnicity. African American and Mexican American girls generally enter puberty earlier than White girls or Asian girls (Biro et al., 2013). By 7 years of age, 10.4 percent of White girls, 15 percent of Hispanic girls, and 23.4 percent of African American girls are showing signs of entering puberty (Biro & Wein, 2010). On average, Black girls experience menarche 6 months earlier than White girls (Cabrera et al., 2014). Recent data in boys suggest a similar pattern, with African American boys developing at a more rapid pace than White or Hispanic boys (Papadimitriou, 2016; Herman-Giddens et al., 2012).

**Implications of Pubertal Timing** The onset of puberty can vary by as many as 5 years among typical boys and girls. Early maturation increases the likelihood of accelerated skeletal maturation and psychosocial difficulties and has been linked to adult health issues, including reproductive tract cancers, type 2 diabetes, and cardiovascular disease (Golub et al., 2008). Early puberty is also predictive of adult obesity, and this effect is partially independent of childhood body mass index. In other words, the finding that early puberty predicts adult obesity is not entirely a consequence of childhood obesity hastening puberty or the association between childhood and adult obesity (Prentice & Viner, 2013). Other findings on early and maturation vary between girls and boys.

Early-maturing girls are at increased risk of anxiety and depression; disruptive behavior; eating disorders; early smoking, drinking, and substance abuse; antisocial behavior; precocious sexual activity; early pregnancy; and attempted suicide (Copeland et al., 2010; Galvao et al., 2014; Blumenthal et al., 2011; Belsky et al., 2010; Susman & Rogol, 2004; Golub et al., 2008). Early maturers tend to be particularly vulnerable to risky behavior and the influence of deviant peers (Mrug et al., 2014; Susman & Rogol, 2004). As adults, women who had early puberty are somewhat more likely to have polycystic ovarian syndrome, a hormonal disorder causing acne, irregular periods, excess hair growth, and the growth of cysts on the ovaries (Fuqua, 2013; Franceschi et al., 2010).

Less data exist on late-maturing girls. Generally, they are not at risk for poor psychological outcomes when compared to "on-time" girls (Ge et al., 2001). However, the cause of late maturation matters. For example, eating disorders and a very low body weight can delay puberty, as can chronic illness (Kaplowitz, 2010). There is also evidence that delayed puberty can, in adulthood, result in lower bone mass density and a higher risk of bone fractures and cardiovascular disease; at the same time, it is associated with a decreased risk of later breast cancer (Zhu & Chan, 2017).

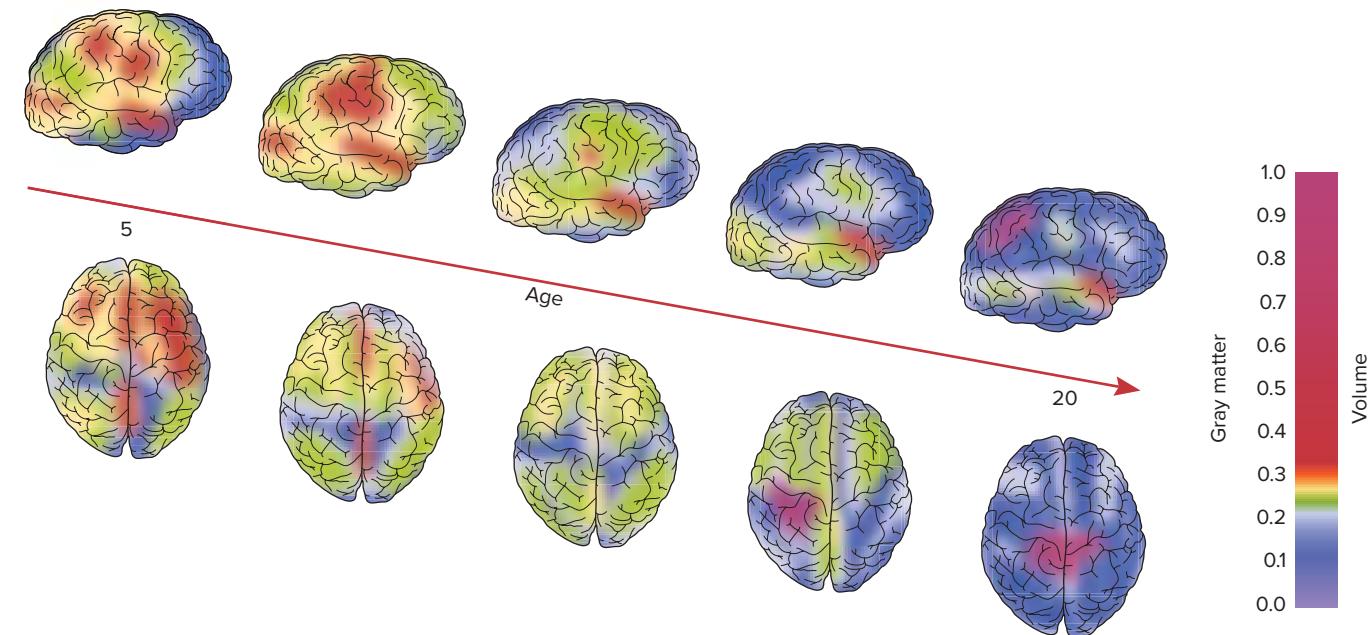
Research on early-maturing boys has had mixed results. The most consistent trends to emerge from the literature are that early-maturing boys are at significant risk for a wide

variety of negative outcomes (Mendle & Ferrero, 2012), including substance use, delinquent behavior, and conduct and behavioral disorders (Hummel et al., 2013; Westling et al., 2008; Golub et al., 2008). The data for late-maturing boys are less consistent and more characteristic of internalizing symptoms (Mendle & Ferrero, 2012). Late-maturing boys have been found to feel more inadequate, self-conscious, rejected, and dominated; to be more dependent, aggressive, insecure, or depressed; to have more conflict with parents and more trouble in school; and to have poorer social and coping skills and be at higher risk for aggression problems (Graber et al., 1997; Sontag et al., 2011).

## The Adolescent Brain

Adolescents tend to engage in certain types of behaviors. They become more interested in and influenced by their peers and social relationships. Additionally, they show an increased tendency for impulsivity and risk-taking, are more likely to experiment with drugs and alcohol, have a propensity for reckless behavior, and find it hard to focus on long-term goals. Nonetheless, they are able to think in more complex and sophisticated ways and can imagine possible futures and alternative realities. While there are certainly individual differences among teens, the adolescent brain contributes to some of these characteristic teen behaviors. To understand the immaturity of the adolescent brain, we need to look at changes in the structure and composition of the brain (Figure 2).

On the positive side, a steady increase in white matter, nerve fibers that connect distant portions of the brain, permits faster transmission of information and better communication across hemispheres (Casey, et al., 2011). In adolescence, this process continues in the frontal lobes (Bava et al., 2010), occurring earlier in women than men (Asato et al., 2010) and coinciding with established differences in pubertal timing in boys and girls. Indeed, puberty is likely associated with neuronal reorganization and maturational processes consistent with the development of some sex differences in adolescence (Goddings et al., 2019).



**FIGURE 2**  
Brain Development from 5 to 15 Years of Age

*Constructed from MRI scans of healthy children and teens, these images compress 15 years of brain development (ages 5–20). Red indicates more gray matter, blue less gray matter.*

Source: Gogtay et al. (2004).

*Because of the still-developing brain, the US Supreme Court ruled the death penalty unconstitutional for murderers 17 years of age or younger when the crime was committed (Roper v. Simmons, 2005). Do you agree with this? Why or why not?*



In addition, adolescence also brings a major spurt in production of gray matter in the frontal lobes (Blakemore & Choudhury, 2006; Kuhn, 2006). The pruning of unused dendritic connections results in a reduction in density of gray matter, or nerve cells, thus increasing the brain's efficiency. This process begins in the rear portions of the brain and moves forward (Konrad et al., 2013; Casey et al., 2011). Thus, by mid- to late adolescence, young people have fewer but stronger, smoother, and more effective neuronal connections, making cognitive processing more efficient.

Unfortunately, this process takes time, and in large part, it has not yet reached the frontal lobes by adolescence. There are consequences to this timeline. The frontal lobes are generally associated with problem solving, impulse control, goal setting, planning, and other similar behaviors generally associated with monitoring social behavior. Given the relatively slow development of the prefrontal cortex, we might expect to see similar slow improvements in social behavior and decision making as children age into the teen years. However, we are more likely to see a rapid shift in trajectory to impulsivity and risk-taking (Casey et al., 2011; Windle et al., 2008).

One possible explanation for this rapid shift to risk-taking lies with patterns of brain development. Because development starts in the back of the brain and moves forward (Konrad et al., 2013; Casey et al., 2011), subcortical brain areas, including the limbic and reward systems, mature earlier (Konrad et al., 2013; Albert et al., 2013). The underdevelopment of frontal cortical systems by comparison may help explain why adolescents tend to seek thrills and novelty and why many of them find it hard to focus on long-term goals (Bjork et al., 2004; Chambers et al., 2003). Although teens are capable of thinking in a sophisticated fashion, the more advanced development in reward areas biases them toward thinking with their subcortical “gas pedal” rather than with the “brakes” that might be provided by their prefrontal cortex (Casey et al., 2011). This tendency to engage in risky behaviors has been found cross-culturally in China, Colombia, Cyprus, India, Italy, Jordan, Kenya, the Philippines, Sweden, Thailand, and the United States (Duell et al., 2018).

Other behavioral changes are related to brain structure. Compared with children, adolescents tend to form more complex relationships and are more concerned with social hierarchies (Steinberg & Morris, 2001), and they become more sensitive to acceptance and rejection from their peers (Blakemore, 2012). These social changes have a neural substrate. Peers exert a stronger influence in adolescence in part because of a heightened neurobehavioral susceptibility to social reward cues and concurrent immaturity in the cognitive control system (Albert et al., 2013). Generally, brain structures in the tempoparietal junction and the posterior superior temporal sulcus decrease in volume (suggesting dendritic pruning) from adolescence into the early twenties (Mills et al., 2012). Moreover, there is also a decline in medial prefrontal cortex activity and gray matter volume at the same time (Blakemore, 2012).

We live lives of great complexity, and our slowly developing brains give us the time and flexibility to learn about the wide variety of environments in which we find ourselves. However, because the brain develops so slowly and extensively during the teen years, this makes it particularly susceptible to both beneficial and harmful environmental influences (Dow-Edwards et al., 2019; Konrad et al., 2013). Thus, cognitive stimulation in adolescence makes a critical difference in the brain’s development. Likewise, adolescent drug use can have particularly devastating effects and can result in lasting behavioral and neurocognitive changes (Salmanzadeh et al., 2020).

## Physical and Mental Health

About 1.2 billion people in the world—1 in 6—are adolescents (OECD/WHO, 2020). Many health problems are preventable and stem from lifestyle choices. However, because adolescents are generally healthy, they may not feel the effects of their choices for decades. Moreover, lifestyle patterns tend to solidify in adolescence, which may result in poor lifelong health habits and early death in adults.

## PHYSICAL ACTIVITY

The benefits of regular exercise include improved strength and endurance, healthier bones and muscles, weight control, and reduced anxiety and stress, as well as increased self-esteem, school grades, and well-being. A sedentary lifestyle may result in increased risk of obesity, type 2 diabetes, and an increased likelihood of heart disease and cancer in adulthood (USDHHS, 2018).

The World Health Organization (2020) recommends that adolescents do 1 hour or more of moderate to vigorous physical activity per day. Unfortunately, data collected from 146 countries, territories, and areas show a distressing pattern: 77.6 percent of boys and 84.7 percent of girls age 11 to 17 do not get enough exercise (Guthold et al., 2020). Across many countries, adolescents from less-affluent families tend to report poorer health and more frequent symptoms, in part because adolescents from more-affluent families tend to have healthier diets and to be more physically active (Elgar et al., 2015). The COVID-19 pandemic worsened these health indicators. Research in across North and South America, Europe, Asia, Oceania, and Africa showed declines in the physical activity levels of adolescents during the pandemic ranging from 10.8 to 90 minutes a day (Rossi et al., 2021).

US adolescents exercise less than adolescents in most other industrialized countries (Guthold et al., 2020). Recent research shows only 23.2 percent of US high school students engage in the recommended daily aerobic physical activity, and the proportion of young people who are inactive increases throughout the high school years (Merlo et al., 2020; Kann et al., 2018). As with other countries, COVID-19 mitigation measures also resulted in further declines in physical activity in American teens (Bates et al., 2020).



*Adolescents who play sports and regularly engage in physical activity tend to feel better than those who do not.*

dsafanda/Getty Images

## SLEEP

The American Academy of Sleep Medicine (Paruthi et al., 2016) recommends that adolescents ages 13 to 18 should regularly sleep a minimum of 8 to 10 hours per 24-hour period. However, most do not. Children generally go to sleep later and sleep less on school days the older they get. While 61.3 percent of US sixth graders report sleeping less than 8 hours a night, by 12th grade, almost 78 percent do not sleep a full 8 hours (Wheaton et al., 2018), a pattern that is true internationally (Owens & Adolescent Sleep Working Group, 2014).

This is particularly distressing as both children and adolescents need sleep, and adolescents need even more sleep than when they were younger (Hoban, 2004). Although many teens attempt to catch up with the sleep deficit on weekends (Owens & Adolescent Sleep Working Group, 2014), sleeping in on weekends does not make up for the loss of sleep on school nights (Hoban, 2004).

Sleep deprivation can sap motivation and cause irritability, and concentration and school performance can suffer. Sleepiness has also been associated with impaired driving and automobile accidents (Garner et al., 2015; Owens & Adolescent Sleep Working Group, 2014). Studies have found that young people ages 16 to 29 are most likely to be involved in crashes caused by the driver falling asleep (Millman et al., 2005). Moreover, insufficient sleep is associated with increased risk for obesity, diabetes, injuries, poor mental health, attention and behavioral problems, and poor academic performance (Wheaton et al., 2018).

Why do adolescents stay up late? They may be doing homework, listening to music, playing video games, talking to or texting friends, and surfing the web. Such behavior has been clearly linked to the chronic sleep deprivation of modern teenagers (Bartel et al., 2015). However, sleep experts now recognize that biological changes are also behind adolescents' sleep problems. The timing of secretion of the hormone melatonin is a gauge of when the brain is ready for sleep. During adolescence, this secretion takes place later at night (Onalapo & Onalapo, 2017), making it difficult for adolescents to go to bed early. But adolescents still need just as much sleep as before, so when they go to bed later than younger children, they need to get up later as well. Yet most secondary schools start earlier than elementary schools. Their schedules are out of sync with students' biological

rhythms (Carskadon, 2011). Starting school later, or at least offering difficult courses later in the day, would positively influence key outcomes such as student attendance, fatigue, and academic achievement (Adolescent Sleep Working Group, 2014; Boergers et al., 2014; Carrell et al., 2011).

## NUTRITION AND EATING DISORDERS

Good nutrition is important to support the rapid growth of adolescence and to establish healthy eating habits that will last through adulthood. Unfortunately, the average US adolescent 12 to 19 years of age scores 46 out of a possible 100 points on the Healthy Eating Index (US Department of Health and Human Services, 2014).

Globally, a lack of sufficient nutrients and calories is more likely to be an issue for many adolescents in developing countries, particularly with respect to iron deficiency anemia. In low-, middle-, and higher-income countries, teens are increasingly becoming overweight and obese (World Health Organization, 2021).

**Overweight and Obesity** Recent global estimates are that slightly over 18 percent of children and adolescents age 5 to 19 are overweight or obese. This includes 216 million overweight and 124 million obese youth (World Health Organization, 2021). Some of the highest rates of child and adolescent obesity can be found in North America, Eastern Europe, Pacific island nations, and the Middle East. Within higher-income countries, such as the United States, Canada, Greece, and Italy, obesity rates are high but have leveled off (UNICEF, 2019).

In middle- and especially lower-income countries, undernutrition often co-occurs with overweight. However, in some countries, including many in East Asia, Latin America, and the Caribbean, a rapid shift from undernutrition to overnutrition is occurring (Bentham et al., 2017). Currently, in every region of the world except parts of sub-Saharan Africa and Asia, there are now more overweight and obese people than underweight people—a change from previous decades (World Health Organization, 2021). Across lower-income countries, nearly 13 percent of boys and more than 13 percent of girls were overweight or obese in 2013. Across higher-income countries, more than 22 percent of girls and nearly 24 percent of boys were overweight or obese (Murray & Ng, 2017).

In the United States, approximately 16 percent of children in ninth through twelfth grade are overweight, and another 15.5 percent are obese (Centers for Disease Control and Prevention, 2020). Rates of obesity are higher in Black and Hispanic adolescents and lower in White and Asian populations. Socioeconomic level exerts an influence; however, this is more closely tied to education than income. Children whose parents are more well educated are less likely to be obese (Ogden et al., 2018). However, sociocultural factors such as safe outdoor recreational areas and access to grocery stores do affect weight (Delamater et al., 2013).

There are clear genetic contributions to obesity. Being born to overweight or obese parents is a risk factor for childhood and adolescent obesity, and overweight and BMI appear to be strongly influenced genetically (Bahreynian et al., 2017; Goodarzi et al., 2018). However, environmental influences matter as well. Children with parents who eat poorly themselves or who exert too much control over their food choices are at risk for later obesity (Delamater et al., 2013). On a wider scale, the increased consumption of animal fat and protein, refined grains, and added sugar, and concurrent decreases in physical activity have created an obesogenic environment likely to result in overweight or obesity for many. These diet and lifestyle changes are brought about by global trade liberalization, economic growth, and urbanization (Malik et al., 2013).

Although evidence is more clear with obesity than overweight, overweight teenagers tend to be in poorer health than their peers and to be at heightened risk of high blood sugar, elevated levels of fat in their blood, hypertension, fatty liver disease, cardiac disease, and asthma (Sharma et al., 2019). Obese teens may have difficulty attending school or engaging in strenuous activity or personal care (Swallen et al., 2005). Overweight teens tend to become overweight adults. As adults, these youth are at increased

risk for a variety of adverse health consequences, including diabetes, hypertension, heart disease, stroke, asthma, and (for women) polycystic ovarian syndrome (Reilly & Kelly, 2011).

There are also psychological consequences. Weight gain and obesity in adolescence are associated with depression, anxiety disorders, behavioral disorders, low self-esteem, lower reported quality of life and well-being, and higher stress. Overweight children are also more likely to be teased, bullied, and rejected by not just peers but sometimes parents, teachers, and health care providers as well. As we will discuss shortly, some youth, especially girls, are at risk for developing disordered eating (Rankin et al., 2016).

Programs that use behavioral modification techniques to help adolescents make lifestyle changes have had success (Ells et al., 2018). For example, interventions that have encouraged increases in physical activity, reductions in television viewing, and encouragement of healthier eating habits, either home- or school-based, have been shown to reduce body mass index and other weight-related outcome measures (Wang et al., 2013; Doak et al., 2006). Still, despite many interventions, the number of 15-year-olds who are overweight or obese has steadily increased since 2000 in most countries that have implemented such programs (World Health Organization, 2021).

**Body Image and Body Satisfaction** Body image—or one's perceptions, thoughts, and feelings about one's body—can be affected by puberty. Overall, boys tend to be more satisfied with their bodies than girls (Mäkinen et al., 2012). However, in part because of the normal increase in girls' body fat during puberty, many girls become unhappy with their appearance, reflecting the cultural emphasis on women's physical attributes (Voelker et al., 2015). Girls tend to express the highest levels of body satisfaction when underweight, some dissatisfaction when average weight, and the most dissatisfaction when overweight. Boys express the most dissatisfaction when overweight and underweight but are more satisfied with an average weight body (Mäkinen et al., 2012).

Body satisfaction is important because it has been related to self-esteem (Wichstrøm & von Soest, 2016), dieting, and disordered eating (Bucchianeri et al., 2016). Indeed, body satisfaction may be protective for overweight girls. In one study, overweight girls with low body satisfaction gained significantly more weight over a decade—an almost 3 unit increase in body mass index—than overweight girls with high body satisfaction. Thus, being dissatisfied with one's body, at least in girls, does not motivate weight loss as is commonly believed (Loth et al., 2015). Part of this may be driven by the ways in which parents discuss weight concerns with their children. When fathers talk to their sons, they are more likely to focus on healthy eating and exercise. By contrast, when mothers talk to their daughters, they are more likely to talk about weight management (Berge et al., 2015).

There are ethnic differences in body satisfaction. Asian American boys and girls have the highest levels of body dissatisfaction, followed by Hispanics, Whites, and African Americans (Bucchianeri et al., 2016). African American girls are generally more satisfied with their bodies and less concerned about weight and dieting than are White girls (Gillen & Lefkowitz, 2012).

There are clearly other influences at play as well. Friends are one important influence. For example, friends' dieting, teasing about weight, and pressure to conform to weight ideals predict weight-control behaviors and negative body image (Balantekin et al., 2018; Kenny et al., 2017). Media also exerts a powerful influence. When adolescents are exposed to images of a thin ideal in mass media content, they show more dissatisfaction with their bodies and greater endorsement of disordered eating behaviors. This effect is strongest when the media is not obviously of a commercial nature, such as when it is embedded within television programs or music videos (Huang et al., 2021). Similar findings have emerged with respect to social media. Research indicates that the use of social media such as Facebook and Instagram is associated with body image concerns and disordered eating in adolescents and that these concerns become more pronounced over time (Fardouly & Vartanian, 2016; Holland & Tiggeman, 2016).

#### body image

Descriptive and evaluative beliefs about one's appearance.

## BOX 1 Eating Disorders: Symptoms

Anorexia	Bulimia
<ul style="list-style-type: none"><li>Using laxatives, enemas, or diuretics inappropriately</li><li>Binge eating</li><li>Going to the bathroom right after meals</li><li>Exercising compulsively</li><li>Restricting the amount of food eaten, cutting food into small pieces</li><li>Dental cavities due to self-induced vomiting</li><li>Depression, confused or slow thinking, poor memory and judgment</li><li>Low blood pressure, significant weight loss and muscle wasting, no menstruation</li></ul>	<ul style="list-style-type: none"><li>Abuse of laxatives, diuretics, or enemas to prevent weight gain</li><li>Binge eating</li><li>Going to the bathroom right after meals</li><li>Frequent weighing</li><li>Self-induced vomiting</li><li>Dental cavities due to self-induced vomiting</li><li>Overachieving behavior</li></ul>

Excessive concern with weight control and body image may be signs of anorexia nervosa or bulimia nervosa, both of which involve abnormal patterns of food intake (Box 1).

### anorexia nervosa

Eating disorder characterized by self-starvation.

**Anorexia Nervosa** A recent review found an estimated 4 percent of young women and 0.3 percent of young men across the globe have been diagnosed with **anorexia nervosa** (van Eeden et al., 2021). People with anorexia have a distorted body image and, though typically severely underweight, think they are too fat. They often are good students but may be withdrawn or depressed and may engage in repetitive, perfectionist behavior.

They are extremely afraid of losing control and becoming overweight (National Institutes of Mental Health, 2021). Early warning signs include determined, secret dieting; dissatisfaction after losing weight; setting new, lower weight goals after reaching an initial desired weight; excessive exercising; and interruption of regular menstruation.

Anorexia is, paradoxically, both deliberate and involuntary: An affected person deliberately refuses food needed for sustenance yet cannot stop doing so even when rewarded or punished. These behavior patterns have been traced back to medieval times and seem to have existed in all parts of the world. Thus, anorexia may be in part a reaction to societal pressure to be slender, but this does not seem to be the only factor or even a necessary one. For example, historical accounts of anorexia often feature self-starvation as a religious or ascetic act (Keel & Klump, 2003).

**Bulimia Nervosa and Binge Eating Disorder** **Bulimia nervosa** affects about 3 percent of young women and 1 percent of young men (van Eeden et al., 2021). A person with bulimia regularly goes on huge, short-lived eating binges (2 hours or less) and then may try to purge the high caloric intake through self-induced vomiting, strict dieting or fasting, excessively vigorous exercise, or laxatives, enemas, or diuretics. These episodes occur at least twice a week for at least 3 months (American Psychiatric Association, 2013). People with bulimia are usually not overweight, but they are obsessed with their weight and shape. They tend to have low self-esteem and may become overwhelmed with shame, self-contempt, and depression (Wilson et al., 2007). There is some overlap between anorexia and bulimia; some people with anorexia have bulimic episodes, and some people with bulimia lose large amounts of weight.

The related **binge eating disorder (BED)** involves frequent binging but without subsequent fasting, exercise, or vomiting (American Psychiatric Association, 2013). People who binge frequently tend to be overweight and to



Taylor Swift, an American singer/songwriter, has spoken publicly about her struggles with an eating disorder, which is often triggered by the intense media focus on her physical appearance.

Doug Peters/Alamy Stock Photo

experience emotional distress and other medical and psychological disorders. BED is the most common eating disorder in the United States, affecting approximately 1.6 percent of adolescents and becoming more common in adulthood. Estimates are that in middle- to high-income countries, approximately 2 percent of adults have BED (Kessler et al., 2013).

**Diversity and Eating Disorders** Initially, much of the literature on anorexia suggested it was primarily a disease of White, middle- to upper-class women. However, some recent data calls this assumption into question (Cheng et al., 2019). For example, girls of all races and ethnicities are more likely to report disordered eating than White boys (Beccia et al., 2019), and White teens are more likely to be diagnosed with an eating disorder than BIPOC teens (Sonneville & Lipson, 2018). However, Black and Hispanic adolescents are more likely to show signs of or be diagnosed with bulimia (Becker et al., 2003). Asian American teens, although less likely to be diagnosed with an eating disorder, are more likely to restrict food, focus on building muscles, persevere on perceived health or caloric content of food, and be more dissatisfied with their bodies (Uri et al., 2021).

The differences in diagnosis rates for BIPOC and White teens may exist in part because BIPOC teens are less likely to be asked by doctors about symptoms than their White counterparts (Becker et al., 2003). Moreover, symptoms may be experienced or reported differently by adolescents from different cultural groups. For example, Asian American teens are less likely than teens from other groups to report distress or loss of control as a symptom (Lee-Winn et al., 2014). Because the criteria for bulimia includes these behaviors as key features, bulimia and binge eating may thus be underdiagnosed in Asian American teens. Social class also matters. BIPOC teens and teens from lower socioeconomic classes are less likely than White teens to perceive a need for treatment (Sonneville & Lipton, 2018) and thus less likely to seek treatment as well.

There is also emerging evidence that sexual minorities are at elevated risk. Sexual minorities—including gay men, lesbian women, and bisexual young adults—are more likely to exhibit disordered eating, express body dissatisfaction, and be diagnosed with an eating disorder than their heterosexual peers (McClain & Peebles, 2016; Meneguzzo et al., 2018; Simone et al., 2020). Research has also shown transgender teens are at higher risk for eating disorders than cisgender teens (Diemer et al., 2015). This risk is as high as 10.5 percent for transgender men and 8.1 percent for transgender women (Nagata et al., 2020).

A variety of explanations for the increased risk exist. Some explanations are similar to those posited for cisgender teens and focus on norms regarding appearance. Other explanations focus on the influence of discrimination, bigotry, and internalized stigma. In this approach, the increased risk is attributed to the continuing pressure from these ongoing stressors (Calzo et al., 2017).

**Treatment and Outcomes** The immediate goal of treatment for anorexia is to get patients to eat and gain weight—goals that are often difficult, given the strength of patients' beliefs about their bodies. Patients who show signs of severe malnutrition, are resistant to treatment, or do not make progress on an outpatient basis may be admitted to a hospital, where they can be given 24-hour care. Once their weight is stabilized, patients may enter less intensive daytime care (McCallum & Bruton, 2003).

One widely used treatment is a form of behaviorally focused, intensive, outpatient family therapy in which parents take control of their teen's eating patterns, and autonomy over eating is relinquished back to the teen gradually. Alternatively, teens may participate in individual therapy, either inpatient or outpatient. Initially, both family and individual therapy show similar outcomes. Cognitive behavioral therapy, which seeks to change a distorted body image and rewards eating with such privileges as being allowed to get out of bed and leave the room, appears to be the most effective treatment for anorexia (Hay, 2013). Unfortunately, many people diagnosed with anorexia relapse, especially in the year following treatment (Khalsa et al., 2017).

**bulimia nervosa**

Eating disorder in which a person regularly eats huge quantities of food and then purges the body by laxatives, induced vomiting, fasting, or excessive exercise.

**binge eating disorder**

Eating disorder in which a person loses control over eating and binges huge quantities of food.

## checkpoint can you...

- Identify typical dietary deficiencies of adolescents?
- Discuss risk factors, effects, treatment, and prognoses for obesity, anorexia, and bulimia?

Both cognitive-behavioral therapy and medications are helpful in the treatment of bulimia and BED, although relapses are common (Linardon & Wade, 2018; Svaldi et al., 2019). In cognitive-behavioral therapy, patients keep daily diaries of their eating patterns and are taught ways to avoid the temptation to binge (Wilson et al., 2007). Medications such as fluoxetine and antidepressants are also used to control core symptoms such as binge eating and purging, ideally in conjunction with therapy. Although they have some success with reducing these behaviors, generally, the use of medications does not help people with BED, who are usually obese or overweight, lose weight (Mitchell et al., 2013).

Because patients with eating disorders are at risk for depression and have a suicide risk 10 times that of the general population (Chesney et al., 2014), antidepressant drugs are often combined with psychotherapy, but evidence of their long-term effectiveness on either anorexia or bulimia is lacking (Wilson et al., 2007). Among people diagnosed with anorexia as teens, approximately 64 percent report a full recovery 30 years later; however, 38 percent report the diagnosis of another psychiatric condition, and 19 percent report they still suffer from an eating disorder (Dobrescu et al., 2020).

## DRUG USE

### substance abuse

Repeated, harmful use of a substance, usually alcohol or other drugs.

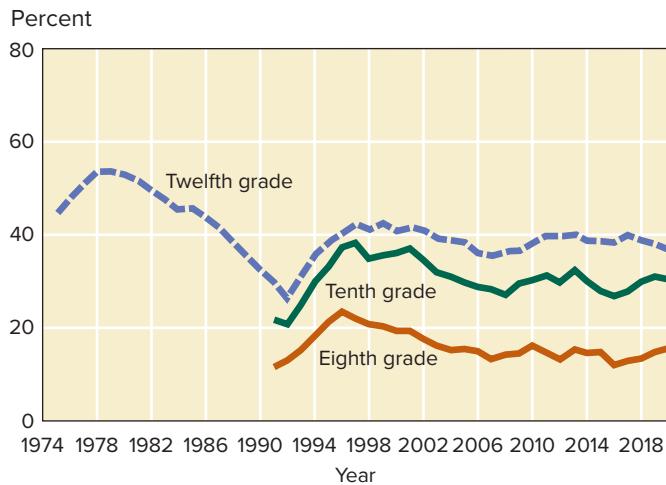
### substance dependence

Addiction (physical, psychological, or both) to a harmful substance.

**Substance abuse** is harmful use of alcohol or other drugs. Abuse can lead to **substance dependence**, or addiction, which may be physiological, psychological, or both, and is likely to continue into adulthood.

**Trends in Drug Use** Nearly half (46.6 percent) of US adolescents have tried illicit drugs by the time they leave high school (Johnston et al., 2021; Figure 3). Approximately 172,000 children aged 12 to 17 years of age received treatment for substance abuse in 2019 (Substance Abuse and Mental Health Services Administration, 2020). The earlier young people start to use a drug, the more frequently they are likely to use it and the greater their tendency to abuse it (Wong et al., 2006).

In the past two decades, there has been an increase in opioid abuse in the general public (Dart et al., 2015). However, the sharp rise in heroin usage reported in the United States has primarily been limited to older teens and emerging adults, where peak levels of usage were reached in the mid-2000s (Schulenberg et al., 2017).



**FIGURE 3**

Trends in High School Students' Use of Illicit Drugs over the Previous 12 Months

Source: Johnston et al. (2021).

**Alcohol** Alcohol is a potent, mind-altering drug with major effects on physical, emotional, and social well-being. Worldwide, 26.5 percent of percent of adolescents age 15 to 19 years reported themselves to be current drinkers, and another 12 percent reported having consumed alcohol previously. Adolescents report binge drinking at relatively high rates—13.6 percent, compared to a rate of 18.2 percent in adults (World Health Organization, 2019).

Culture is an influence on alcohol consumption. For example, adolescent alcohol consumption is more common in European and American regions and less common in Southeast Asian and Eastern Mediterranean regions (World Health Organization, 2019). The reasons for alcohol use vary as well. Generally, teens from cultures high in individualism, including countries such as the United States, Switzerland, Hungary, Canada, the Netherlands, the United Kingdom, and Ireland, are more likely to drink for positive reinforcement motives. In other words, they drink with others, they drink to get drunk, and they are more likely to do so than are teens from collectivistic countries such as Portugal, Mexico, Brazil, and Spain (Kuntsche et al., 2017).

The economic wealth of a country also matters. For example, in Africa, heavy episodic drinking is more common in lower-income countries than in higher-income countries. However, across Europe, the opposite is true (World Health Organization, 2019). Gender also interacts with cultural variables. Although the differences have become smaller in recent years, overall boys tend to drink more and drink more frequently than girls (Dir et al., 2017). This may be, in part, because as women have participated more fully in the labor force, gender roles have become less distinct, and activities previously limited to men have opened up to women (Kuntsche et al., 2011).

Alcohol use in US teenagers peaked in 1979, rose until the 1990s, and then has continued a gradual decline. In 2020, 25.6 percent of US eighth graders, 46.4 percent of tenth graders, and 61.5 percent of twelfth graders said they had tried alcohol, and current use (in the past 30 days) is likewise high. **Binge drinking**—consuming five or more drinks on one occasion—puts teens at particularly high risk. In 2020, binge drinking prevalence rates for eighth, tenth, and twelfth graders were 5 percent, 10 percent, and 17 percent, respectively (Johnston et al., 2021).

Brain imaging studies have documented structural brain changes in adolescents as a result of alcohol consumption. When compared to teens who do not drink alcohol, a recent meta-analysis showed that those who do drink show changes in key prefrontal areas, including the middle frontal gyrus, superior frontal gyrus, left frontal cortex, frontal pole, and left frontal gyrus—all areas involved in executive control. Structural differences have also been found in areas of the brain involved in reward mechanisms, including the dorsal striatum, thalamus, anterior cingulate, and inferior frontal gyrus (Ewing et al., 2014). These changes may help explain the deficits in verbal learning, attention, and visuospatial task performance found in teens who drink alcohol (Spear, 2018). These neural and performance consequences may persist through adulthood. There are also suggestions the reward responsiveness of the dopamine system may remain elevated to alcohol later in life, potentially contributing to heavier drinking patterns later as well (Lees et al., 2020).

**Marijuana** Marijuana is by far the most widely used illicit drug in the United States. Currently, medical marijuana use is legal in 37 states and the District of Columbia, and recreational marijuana use is legal in 19 states. Public health researchers have been concerned the decriminalization and legalization of marijuana might lead to greater usage of marijuana as well as an increase in the number of people who develop problems with its abuse. Meta-analyses indicate the legalization of medical marijuana did not seem to impact usage in adolescents (Sarvet et al., 2018). However, emerging data suggest the legalization of recreational marijuana may lead to increased use by teens (Cerdá et al., 2020). By the end of high school, students report a lifetime prevalence use of 43.7 percent, and approximately 1 in every 17 high school seniors uses marijuana daily (Johnston et al., 2021).

Research has found marijuana use, particularly that which starts early or is heavy or frequent, to be associated with decreased functional connectivity of the brain, poorer executive control, and declines in academic achievement (Cyrus et al., 2020). Marijuana usage is also associated with increases in automobile accidents, emergency room visits, and hospitalizations, as well as in psychotic, mood, and addictive disorders (Hammond et al., 2020). However, the debate about marijuana use is complicated by the fact that marijuana does have legitimate medical applications and has been used to manage such conditions as nausea, chronic pain, and epilepsy (Volkow et al., 2014).

**Tobacco** The use of cigarettes and other tobacco products is a global health issue. Adolescent use is particularly concerning because the vast majority of smokers begin smoking prior to adulthood and became addicted in adolescence. Cigarettes will kill approximately half of all lifetime users and increase the risk of multiple cancers, especially lung cancer, as well as heart disease, stroke, emphysema, and multiple other diseases (Eriksen et al., 2013).

#### **binge drinking**

Consuming five or more drinks (for men) or four or more drinks (for women) on one occasion.



*Marijuana is the most widely used illicit drug in the United States.*  
ilkov\_igor/Shutterstock



*Research shows that although marijuana may lead to longer sleep duration, students who used cannabis the night before reported more fatigue the following day than those students who did not use any cannabis to help them sleep (Goodhines et al., 2019).*

Longitudinal research has shown sadness is predictive of smoking status. People reporting higher levels of sadness were more likely to be smokers and less likely to have quit smoking 20 years later (Dorison et al., 2020).

Adolescent tobacco use is a less widespread problem in the United States than in most other industrialized countries (Gabhairn & François, 2000). Still, in the United States, approximately 2.2 percent of 8th graders, 3.2 percent of 10th graders, and 7.5 percent of 12th graders are current (past-month) cigarette smokers (Johnston et al., 2021). Black youth tend to smoke less but metabolize nicotine more slowly than White youth, so their bodies take longer to get rid of it and they are quicker to become dependent (Moolchan et al., 2006).

Older siblings and friends can increase the likelihood of tobacco use (Rende et al., 2005), and closer friends have a stronger influence on each other than more distant friends (Fujimoto & Valente, 2012). Estimates are that teens whose friends smoke are twice as likely to start or continue smoking. Moreover, this effect is stronger in collectivistic cultures than in individualistic cultures, presumably because of the greater importance placed on interdependent social goals and group norms (Liu et al., 2017). Research also indicates that peer and sibling influences can also act via media such as social media postings and messaging content (Huang et al., 2014).

E-cigarettes were initially marketed as smoking cessation tools. Instead, the use of e-cigarettes has risen sharply in teens and is likely to result in greater numbers of addicted individuals over time (Herman & Tarran, 2020).

Parents who smoke significantly increase the risk that their adolescent will smoke (Leonardi-Bee et al., 2011). However, parents can also provide a positive influence by discouraging friendships with peers who smoke (Simons-Morton & Farhat, 2010) and by providing good supervision and monitoring for their teen (Kim & Chun, 2018). Where a teen lives also matters. Young adolescents attracted to smoking tend to live in poorer neighborhoods (Cambron et al., 2018), and smokers tend to live or go to school in locations with a high density of tobacco retailers (Gwon et al., 2016).

The presence of substance use in the media is another important influence. Movies that depict smoking and advertising or marketing via social networking sites is associated with earlier initiation of and increased smoking in youth (Charlesworth & Glantz, 2005; Jackson et al., 2018). National campaigns, including graphic warnings of risk associated with smoking, bans on tobacco advertising, eliminating illicit tobacco trade, and, most important, increasing taxes on cigarettes, have been shown to reduce tobacco use (World Health Organization, 2021).

An alarming trend is the increase in the use of e-cigarettes. Vaping involves the use of an electronic battery-powered device that uses an atomizer to vaporize a substance. The aerosol may contain nicotine, marijuana, or flavored liquids. Vaping devices were initially marketed in sweet or fruity flavors deemed to be attractive to teens and frequently designed to look like common objects, such as pens or USBs, in order to make them easier to hide (Jones & Salzman, 2020). Although they were initially marketed as a smoking cessation tool, many e-cigarettes contain higher nicotine levels than traditional cigarettes, and the potential for addiction is high (Morean et al., 2019).

These factors may be responsible for the sharp increase in adolescent vaping. Vaping has increased to a larger degree than the use of any other substance tracked thus far (Johnston et al., 2021). This is concerning as research shows e-cigarette users are more likely to progress to combustible tobacco (Jenssen & Wilson, 2020). Moreover, although vaping is less harmful than smoking traditional cigarettes, that does not mean it is not harmful at all. Research shows vaping is associated with cardiovascular risk factors (Peruzzi et al., 2020) and lung injury (Ceccini et al., 2020).

## DEPRESSION

Across the world, depression is a leading cause of death and disability in teens (World Health Organization, 2021). In the United States in 2019, 15.4 percent of young people ages 12 to 17 experienced at least one episode of major depression, and only 43.3 percent of them received mental health services (Substance Abuse and Mental Health Services Administration, 2020). Depression in young people does not necessarily appear as sadness. It can also be expressed as irritability, boredom, or inability to experience pleasure (see Figure 4).

Girls are more likely to experience depression than boys. This gender difference starts off relatively minor but increases in magnitude as children move through adolescence

(Breslau et al., 2017). The difference may be related to biological changes associated with puberty, socialization influences, or girls' greater vulnerability to stress in social relationships (Birmaher et al., 1996; Hankin et al., 2007). Other risk factors include a family history of depression; stress, especially if chronic or severe; anxiety; substance abuse; diet and sleep patterns; and poor physical health (Thapar et al., 2012; Cairns et al., 2014; Naicker et al., 2013). Youth who experience bouts of depression in childhood or adolescence are at risk for the development of bipolar disorder, in which depressive episodes ("low" periods) alternate with manic episodes ("high" periods) characterized by increased energy, euphoria, grandiosity, and risk-taking (Faedda et al., 2015). Previous data on social isolation suggested the COVID-19 lockdowns might be associated with an increase in depression and anxiety in teens (Knopf, 2020). Although the data is preliminary, across different countries, adolescents are exhibiting elevated levels of depression, stress, and anxiety (Al Omari et al., 2020; Baird et al., 2020; Tang et al., 2021).

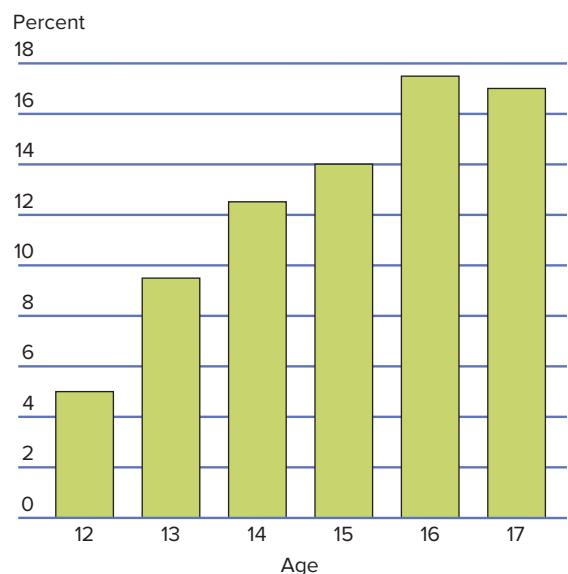
Depressed adolescents who do not respond to outpatient treatment or who have substance dependence or psychosis or seem suicidal may need to be hospitalized. Psychotherapy is often used as a treatment; however, studies have found that while it can be effective in the short term, its effects last no more than a year (Weisz et al., 2006). More commonly, medications are used. Selective serotonin reuptake inhibitors are currently approved for use in children and adolescents and commonly prescribed. Although there are concerns about their safety, research suggests that the benefits outweigh the risks (Maughan et al., 2013). The most effective treatment for depressed adolescents, at least in the short term, seems to be a combination of medications and cognitive behavioral therapy (Dubicka et al., 2010).

## DEATH IN ADOLESCENCE

Worldwide in 2019, 1.5 million teens died, primarily from preventable causes. The leading causes of death were injuries as a result of automobile accidents or drowning, violence, and suicide. For girls aged 15 to 19 years, the leading cause of death is complications of pregnancy and childbirth (World Health Organization, 2021). In the United States, 75 percent of all deaths among adolescents resulted from motor vehicle crashes, other unintentional injuries, homicide, and suicide, with the remainder of deaths stemming from medical causes such as cancer, heart disease, and congenital malformations. The mortality rate of 15- to 19-year-old American males is almost 2½ times that of female adolescents (Heron, 2019; see Figure 5). Although for decades, car accidents were the leading cause of death for children and teens, in 2020, gun-related deaths rose sharply and became the leading cause of death in this group (Goldstick et al., 2022).

**Deaths from Vehicle Accidents** Motor vehicle collisions are the leading cause of death in American 15- to 20-year-olds (Banz et al., 2019). Collisions are more likely to be fatal when teenage passengers are in the vehicle, and the more passengers, the greater the risk (Ouimet et al., 2015). The risk is also higher for males and for new drivers. In the United States, 5.4 percent of teens admit to driving after consuming alcohol (Yellman et al., 2020), and about 1 in 6 teens involved in fatal traffic crashes had been drinking (National Highway Traffic Safety Administration, 2017).

Another important risk factor is distracted driving, which includes actions such as texting, talking on a cell phone, or eating. Although all drivers risk a crash if distracted, novice drivers are at the highest risk. For example, they are 8 times more likely to crash or have a near miss when placing a phone call in comparison to experienced drivers, who are 2 times more likely to do so (Klauer et al., 2014). Unfortu-



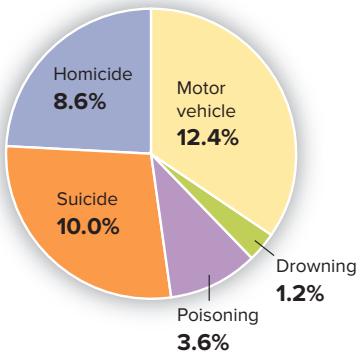
**FIGURE 4**  
Depression Rates for 12- to 17-Year-Olds

Source: National Institute of Mental Health, National Institutes of Health. (2017).



*This young girl might be sad or worried about grades or a relationship—normal worries for an adolescent. But if sadness persists along with symptoms such as the inability to concentrate, fatigue, apathy, or feelings of worthlessness, it might indicate depression.*

Tomas Rodriguez/Fancy/SuperStock



**FIGURE 5**

## Leading Causes of Adolescent Deaths

*In the United States, motor vehicle crashes are responsible for the greatest percentage of deaths among teens age 15 to 19, followed by suicide and homicide.*

Source: Curtin et al. (2018).

nately, 39 percent of driving teens report texting or emailing while driving (Yellman et al., 2020).

Despite efforts aimed at increasing seat belt use among teens, observed use among teens and young adults was approximately 57 percent in 2019 (Yellman et al., 2020)—the lowest of any age group (Centers for Disease Control, 2018). Over half of young people 16 to 20 years old involved in fatal motor vehicle crashes are unbuckled (National Highway Traffic Safety Administration, 2017). Teens who are Black, younger, and have lower grades are less likely to wear seat belts (Yellman et al., 2020).

**Suicide** Globally, suicide is the third-leading cause of death in 15- to 19-year-olds (World Health Organization, 2021) and the second-leading cause of death among US 15- to 19-year-olds (Heron, 2021). Having a firearm in the home increases the risk of suicide by 3 times (Anglemyer et al., 2014), and over 80 percent of teens who commit suicide at home do so with a firearm owned by their parents (Johnson et al., 2010).

Overall, adolescent girls are more likely to attempt suicide but tend to use less lethal methods, such as suffocation or poisoning, and thus are more likely to survive. Although adolescent boys are less likely to attempt suicide, their greater propensity to use firearms results in a higher chance of a successful attempt (Price & Khubchandani, 2017).

Although suicide occurs in all ethnic groups, Native American boys have the highest rates and African American girls the lowest (Curtin et al., 2018). Sexual-minority youth, including gay, lesbian, and bisexual teens, are at increased risk for suicide and are more likely to consider, plan, or attempt suicide (Caputi et al., 2017). Transgender adolescents, especially female to male youth, are at particularly high risk (Toomey et al., 2018). Forty-one percent of transgender or gender-nonconforming adults report attempting suicide at some point in their life (Herman et al., 2014).

Young people who consider or attempt suicide are more likely to be either perpetrators or victims of violence and to have school problems, academic or behavioral. Many have suffered from maltreatment in childhood and have severe problems with relationships. They tend to think poorly of themselves, to feel hopeless, and to have poor impulse control and a low tolerance for frustration and stress. These young people are often alienated from their parents and have no one outside the family to turn to. They also tend to have attempted suicide before, to have friends or family members who did so, or to report suicidal ideation (Borowsky et al., 2001; Brent & Mann, 2006; Nock et al., 2013). Substance abuse, especially that of heroin, is also a risk factor, and that risk increases with the number of illicit substances being used (Wong et al., 2013). Protective factors that reduce the risk of suicide include a sense of connectedness to family and school, emotional well-being, and academic achievement (Taliaferro & Muehlenkamp, 2014; Borowsky et al., 2001).

Whenever a person expresses suicidal feelings, it is essential to address the statements. For instance, one might ask direct questions such as “Have you thought about how you would do it?” or “Are you thinking of hurting yourself?” If the person answers affirmatively, emergency help is needed. Do not leave the person alone, and seek help from trained professionals (such as in an emergency room) immediately.

**Homicide** Homicides are the third-leading cause of death for adolescents in the United States (Heron, 2018), in part because firearm-related deaths are far more common in the United States than in other industrialized countries (Cunningham et al., 2018). The United States has a higher firearm mortality rate than the next highest 25 industrialized nations combined (Blum & Qureshi, 2011). The chief reason for these grim statistics seems to be the ease of obtaining a gun in the United States (AAP Committee on Injury and Poison Prevention, 2000).

Adolescent boys are eight times more likely to be fatally shot than girls (Price & Khubchandani, 2017). Race and ethnicity matter as well; African American and Hispanic teens are far more likely to be the victims of gun violence than are White teens (Centers for Disease Control and Prevention, 2020). Gun fatalities make up about

one-third of all injury deaths and more than 85 percent of homicides in that age group. Rather than being protective, having a firearm in the home significantly increases the risk of death from homicide or suicide (Flaherty & Klig, 2020). School shootings in the United States have become increasingly common, with at least 549 shooting incidents in schools from 2013 to 2019 (Everytown Research and Policy, 2021). Research shows that the passage of laws preventing child access to firearms is associated with a reduction in child and adolescent unintentional firearm deaths, particularly when such laws allow for felony rather than misdemeanor charges (Zeoli et al., 2021).

## COGNITIVE DEVELOPMENT

### Aspects of Cognitive Maturation

Adolescents not only look different from younger children, but they also think and talk differently. Although their thinking may remain immature in some ways, many are capable of abstract reasoning and sophisticated moral judgments and can plan more realistically for the future.

#### PIAGET'S STAGE OF FORMAL OPERATIONS

Adolescents enter what Piaget called the highest level of cognitive development—**formal operations**—when they move away from their reliance on concrete, real-world stimuli and develop the capacity for abstract thought. This development, usually around age 11, gives them a new, more flexible way to manipulate information. They can use symbols to represent other symbols (for example, letting the letter X stand for an unknown numeral) and thus can learn algebra and calculus. They can better appreciate the hidden messages in metaphor and allegory and thus can find richer meanings in literature. They can think in terms of what might be, not just what is. They can imagine possibilities and can form and test hypotheses.

**formal operations**

Piaget's final stage of cognitive development, characterized by the ability to think abstractly.

**Hypothetical-Deductive Reasoning** Hypothetical-deductive reasoning involves a methodical, scientific approach to problem solving, and it characterizes formal operations thinking. It involves the ability to develop, consider, and test hypotheses, and the young person can be compared to a scientist exploring a problem. To appreciate the difference formal reasoning makes, let's follow the progress of a typical child in dealing with a classic Piagetian problem, the pendulum problem.\*

**hypothetical-deductive reasoning**

Ability, believed by Piaget, to accompany the stage of formal operations, to develop, consider, and test hypotheses.

The child, Adam, is shown the pendulum—an object hanging from a string. He is then shown how he can change any of four factors: the length of the string, the weight of the object, the height from which the object is released, and the amount of force he may use to push the object. He is asked to figure out which factor or combination of factors determines how fast the pendulum swings.



How can parents and teachers help adolescents improve their reasoning ability?

When Adam first sees the pendulum, he is not yet 7 years old and is in the preoperational stage. He tries one thing after another in a hit-or-miss manner. First, he puts a light weight on a long string and pushes it; then he tries swinging a heavy weight on a short string; then he removes the weight entirely. He cannot solve the problem.

Adam next encounters the pendulum at age 10, when he is in the stage of concrete operations. This time, he discovers that varying the length of the string and the weight of the object affects the speed of the swing. However, because he varies both factors at the same time, he cannot tell which is critical or whether both are.

\*This description of age-related differences in the approach to the pendulum problem is adapted from H. Ginsburg & S. Opper. (1979). *Piaget's theory of intellectual development* (2nd ed.). Prentice Hall.

# on the world

## CULTURE AND COGNITION

When Piaget first developed his theories, it was assumed his stages of cognitive development represented universal aspects of human development and that all people in all cultures went through the same processes as those in Western countries. However, as research began in different cultures, it became clear this original conception was simplistic and that culture profoundly affects the path development takes.

For example, when adolescents in New Guinea were tested on the pendulum task, none was able to solve it. In Rwanda (Gardiner & Kozmitzki, 2005) and Nigeria (Hollos & Richards, 1993), only a few teens were able to adequately solve the puzzle. On the other hand, Chinese children in Hong Kong, who had been to British schools, did at least as well if not better than US and European children. Apparently, formal reasoning is a learned ability that is not equally necessary or equally valued in all cultures, and the experiences children have shape their developing abilities.

Does this mean, then, that adults in cultures other than Western ones function at lower levels of cognitive complexity? Even Piaget (1972) eventually realized this

was not the case. Rather, adults learn to reason in the ways their culture demands and while doing culturally relevant activities. For example, when African men from the Côte d'Ivoire play *baoule*, a board game in which opponents capture seeds from each other, they use a mix of sophisticated cognitive strategies, including complex rules, offensive and defensive moves, and abstract calculations (Retschitzki, 1989).

That Piaget had to change his theories does not make them bad theories; rather, this is how science works. Piaget was instrumental in developing the fields of cognitive and developmental psychology. However, his original theories required modification in light of what we know today.



Do you think it would be possible to construct a reasoning task free of cultural content? Why or why not?

Fifty percent of college students, even those enrolled in psychology courses where perception is addressed, believe that vision includes rays coming into our eyes (which is correct) as well as rays bouncing back out of our eyes (which is not) (Gregg et al., 2001). In other words, 50 percent of students think we can see with something akin to X-ray vision.

At 16, Adam goes at the pendulum problem systematically. He varies one factor at a time, holding the other three factors constant. In this way, he is able to solve the problem and determine that only one factor—the length of the string—impacts how fast the pendulum swings. He is now capable of hypothetical-deductive reasoning.

Adam's solution of the pendulum problem shows that he has arrived at the stage of formal operations. He is now capable of hypothetical-deductive reasoning. He considers all the relationships he can imagine and tests them systematically, one by one, to eliminate the false and arrive at the true. Hypothetical-deductive reasoning gives him a tool to solve problems, from fixing the family car to constructing a political theory.

What brings about the shift to formal reasoning? Piaget attributed it to a combination of brain maturation and expanding environmental opportunities. Both are essential: Even if young people's neurological development has advanced enough to permit formal reasoning, they can attain it only with appropriate stimulation.

As with the development of concrete operations, schooling and culture play a role, as Piaget (1972) ultimately recognized (see Window on the World).

## IMMATURE ASPECTS OF ADOLESCENT THOUGHT

As children's thinking becomes more complex, they develop from egocentric beings to persons capable of solving abstract problems and imagining ideal societies. Yet in some ways, adolescents' thinking seems strangely immature. According to the psychologist David Elkind (1967), such behavior stems from adolescents' inexperienced ventures into formal operational thought.

For instance, one characteristic is self-consciousness. Adolescents can think about thinking—their own and other people's. However, in their preoccupation with their own mental state, adolescents often assume everyone else is thinking about the same thing they are thinking about: themselves. Elkind refers to this as the **imaginary audience**, a conceptualized “observer” who is as concerned with a young person's thoughts and behavior as he or she is. A teen's certainty, for example, that the entire high school is staring at his new, small pimple all day long is one example of this.

The imaginary audience may have new implications in the age of social media. There are data indicating the use of social media is positively related to imaginary audience ideation in adolescents (Cingel & Krcmar, 2014). Moreover, teens who are high in imaginary audience ideation are more likely to objectify themselves when posting selfies on social media sites (Zheng et al., 2019). This is problematic given the relationship between self-objectification and depression, especially in teen girls (Jones & Griffiths, 2015). Moreover, adolescents and young adults who report higher levels of imaginary audience ideation are more likely to be either a victim or perpetrator of cyberbullying (Rai et al., 2017).

Another characteristic of adolescent thought involves the **personal fable**. The personal fable is the belief by adolescents that they are special, their experience is unique, and they are not subject to the rules that govern the rest of the world. This belief might encourage adolescents to believe they can drive while texting on a cell phone and not get into an accident. This form of egocentrism has been theorized to underlie risky, self-destructive behavior.

Research has generally shown that adolescents are indeed more likely to make impulsive or risky decisions (Albert & Steinberg, 2011). However, contrary to Elkind's beliefs, this tendency to make risky decisions does not come from an inability to reason effectively about the consequences, nor does it stem from an adolescent belief about being special or unique. Rather, brain immaturity, as described in “The Adolescent Brain” section, biases adolescents toward risky decision making.

According to Piaget, egocentrism should decline alongside the development of formal operations thought. However, data on the decline of egocentrism have been equivocal. While some studies have found that levels of egocentrism are similar in teens and adults (Rai et al., 2016), others have found that egocentrism, especially in girls, declines over adolescence (Van der Graaf et al., 2014). Others have found no influence of egocentrism on the imaginary audience but have found support for the role of self-consciousness (Galanaki, 2012).

College students judge other young adults who use swear words as less intelligent and trustworthy (DeFrank & Kahlbaugh, 2019), so mind your manners!



#### imaginary audience

The tendency of adolescents to falsely believe themselves to be the focus of others' attention.

#### personal fable

The adolescent belief in one's uniqueness and invulnerability; associated with risk-taking.

### checkpoint can you . . .

- Explain the difference between formal operational and concrete operational thinking, as exemplified by the pendulum problem?
- Identify factors influencing adolescents' development of formal reasoning?
- Evaluate strengths and weaknesses of Piaget's theory of formal operations?

## LANGUAGE DEVELOPMENT

In adolescence, both oral and written vocabulary knowledge continues to improve and become more adultlike (Ricketts et al., 2020). By ages 16 to 18, the average young person knows approximately 80,000 words (Owens, 1996). This is important for academic success: Vocabulary knowledge is crucial for reading comprehension (Oslund et al., 2018).

With the advent of abstract thought, adolescents can define and discuss such abstractions as love, justice, and freedom. They more frequently use such terms as *however*, *otherwise*, *anyway*, *therefore*, *really*, and *probably* to express logical relationships. They become more conscious of words as symbols that can have multiple meanings, and they take pleasure in using irony, puns, and metaphors (Duthie et al., 2008; Katz et al., 2004).

Adolescents also become more skilled in social perspective-taking, the ability to tailor their speech to another person's point of view. So, for example, a teen might use simpler words when talking to a child or swear among friends and show deference when speaking to an adult. This ability is essential for skilled conversation.

- Name two immature aspects of adolescent thought?
- Identify characteristics of adolescents' language development that reflect cognitive advances?

Language is not static; it is fluid, and the words and phrases used by people change over time. These changes are striking in the speech of adolescents, who often develop their own unique terms. Vocabulary may differ by gender, ethnicity, age, geographical region, neighborhood, and type of school (Eckert, 2003) and varies from one clique to another. Teenage slang is part of the process of developing an independent identity separate from parents and the adult world. This specialized vocabulary even extends to electronic communication, with its own rules for spelling, abbreviations, and the use of emoticons and emojis to convey emotional content (Haas et al., 2011).

## MORAL DEVELOPMENT AND PROSOCIAL BEHAVIOR

As children attain higher cognitive levels, they become capable of more complex reasoning about moral issues.

**Moral Reasoning** A woman is near death from cancer. A druggist has discovered a drug that doctors believe might save her. The druggist is charging \$2,000 for a small dose—10 times what the drug costs him to make. The sick woman's husband, Heinz, borrows from everyone he knows but can scrape together only \$1,000. He begs the druggist to sell him the drug for \$1,000 or let him pay the rest later. The druggist refuses, saying, "I discovered the drug, and I'm going to make money from it." Heinz, desperate, breaks into the man's store and steals the drug. Should Heinz have done that? Why or why not? (Kohlberg, 1969).

Heinz's problem is the most famous example of Lawrence Kohlberg's approach to studying moral development. Starting in the 1950s, Kohlberg and his colleagues posed hypothetical dilemmas like this one to 75 boys ages 10, 13, and 16 and continued to question them periodically for more than 30 years. Kohlberg came to believe that moral development was a consequence of moral reasoning, which depended heavily on cognitive development. Moreover, he believed that at the heart of every dilemma was the concept of justice—a universal principle.

**TABLE 1** Kohlberg's Six Stages of Moral Reasoning

Levels	Stages of Reasoning
<b>Level I: Preconventional morality (ages 4 to 10)</b>	<p><i>Stage 1: Orientation toward punishment and obedience.</i> "What will happen to me?" Children obey rules to avoid punishment. They ignore the motives of an act and focus on its physical form (such as the size of a lie) or its consequences (for example, the amount of physical damage).</p> <p><i>Stage 2: Instrumental purpose and exchange.</i> "You scratch my back, I'll scratch yours." Children conform to rules out of self-interest and consideration for what others can do for them.</p>
<b>Level II: Conventional morality (ages 10 to 13 or beyond)</b>	<p><i>Stage 3: Maintaining mutual relations, approval of others, the golden rule.</i> "Am I a good boy or girl?" Children evaluate an act according to the motive behind it or the person performing it, and they take circumstances into account.</p> <p><i>Stage 4: Social concern and conscience.</i> "What if everybody did it?" Children are concerned with doing their duty, showing respect for higher authority, and maintaining the social order. They consider an act always wrong if it violates a rule and harms others.</p>
<b>Level III: Postconventional morality (early adolescence, not until young adulthood, or never)</b>	<p><i>Stage 5: Morality of contract, of individual rights, and of democratically accepted law.</i> People think in rational terms, valuing the will of the majority and the welfare of society. While they recognize that there are times when human need and the law conflict, they believe it is better for society in the long run if they obey the law.</p> <p><i>Stage 6: Morality of universal ethical principles.</i> People do what they as individuals think is right based on their own individual internal standards regardless of legal restrictions or the opinions of others.</p>

Sources: Adapted from Kohlberg (1969); Lickona (1976).

On the basis of thought processes shown by responses to his dilemmas, Kohlberg (1969) described three levels of moral reasoning, each divided into two stages (Table 1):

- **Level I: Preconventional morality.** People act under external controls. They obey rules to avoid punishment or reap rewards, or they act out of self-interest. This level is typical of children ages 4 to 10.
- **Level II: Conventional morality (or morality of conventional role conformity).** People have **internalized the standards of authority figures**. They are concerned about being “good,” pleasing others, and maintaining the social order. This level is typically reached after age 10; many people never move beyond it, even in adulthood.
- **Level III: Postconventional morality (or morality of autonomous moral principles).** People recognize conflicts between moral standards and make their own judgments on the basis of principles of right, fairness, and justice. People generally do not reach this level of moral reasoning until at least early adolescence or, more commonly, in young adulthood, if ever.

In Kohlberg’s theory, it is the reasoning underlying a person’s response to a moral dilemma, not the response itself, that indicates the stage of moral development. Two people who give opposite answers may be at the same stage if their reasoning is based on similar factors. Later, Kohlberg proposed a seventh, “cosmic,” stage in which people consider the effect of their actions not only on other people but on the universe as a whole (Kohlberg, 1981; Kohlberg & Ryncarz, 1990).

Initial research supported Kohlberg’s theory. The American boys that Kohlberg and his colleagues followed through adulthood progressed through Kohlberg’s stages in sequence, and none skipped a stage. Their moral judgments correlated positively with age, education, IQ, and socioeconomic status (Colby et al., 1983). More recent research, however, has cast doubt on the delineation of some of Kohlberg’s stages. For example, some children can reason flexibly about moral issues as early as 6 years of age (Helwig & Jasiobedzka, 2001).

Moreover, there are influences on moral behavior other than cognitive complexity. Some investigators suggest that moral activity is motivated not only by abstract considerations of justice but also by such emotions as empathy, guilt, distress, and the internalization of prosocial norms (Eisenberg & Morris, 2004; Gibbs & Schnell, 1985). Indeed, one researcher argued that men, Kohlberg included, were biased and viewed morality solely in terms of justice and fairness; women held a different but equally valuable set of moral dictates that placed caring and avoiding harm as higher goals than justice (Gilligan, 1982/1993). However, gender differences in moral reasoning are small (Jaffee & Hyde, 2000), and thus, the argument for a male bias in this approach has faded.

In addition, while Kohlberg paid little attention to these influences, both parents and peers also influence moral development. Having supportive, authoritative parents or close friends to talk to or being perceived as a leader are both associated with higher moral reasoning. Moreover, Kohlberg’s approach does not seem to represent moral reasoning in non-Western cultures as accurately as in the Western culture in which it was originally developed (Eisenberg & Morris, 2004).

**Culture, Religion and Moral Reasoning** Culture affects moral reasoning because important cultural values and goals, including those associated with religion, are reflected in the dominant ethical system of a culture. Because world views differ across cultures, so do the ethical systems.

Three key ethical systems have been identified cross-culturally. The ethic of autonomy is characteristic of individualistic cultures, and it focuses on the rights of the individual and abstract concepts of justice. The ethic of community, more characteristic of collectivistic cultures, focuses on social connections, duty to others, group harmony, and respect for the structures that maintain social harmony. Last, the ethic of divinity views the person as a temporary vessel for a divine soul or sacred being. Moral dictates, in this view, center upon attaining holiness and endorse concepts related to sanctity or purity (Shweder et al., 1997).

#### preconventional morality

First level of Kohlberg’s theory of moral reasoning in which control is external and rules are obeyed in order to gain rewards or avoid punishment or out of self-interest.

#### conventional morality (or morality of conventional role conformity)

Second level in Kohlberg’s theory of moral reasoning in which standards of authority figures are internalized.

#### postconventional morality (or morality of autonomous moral principles)

Third level of Kohlberg’s theory of moral reasoning, in which people follow internally held moral principles and can decide among conflicting moral standards.



Can you think of a time when you or someone you know acted contrary to personal moral judgment? Why do you think this happened?

Religion also plays a role in moral development. Both within and across countries, religiously liberal people are more likely to endorse the ethic of autonomy than are those who are religiously conservative. Religiously conservative people as a whole are more likely to use the ethic of divinity than religiously liberal people, although both groups frequently use the ethic of community (Jensen, 2011).

When compared to people in other, similar wealthy countries, adults in the United States report being far more religious and placing a higher importance on religion (Fahmy, 2018). However, although American teens tend to hold similar views on religion as their parents, most report being less religious. Most teens also do not believe religion is necessary to be a moral person and report they turn to parents, other family members, their own experiences, and common sense when they are trying to distinguish right from wrong (Scuipac et al., 2020).

**Prosocial Behavior** Some researchers have studied prosocial moral reasoning, similar to care-oriented moral reasoning or the ethic of community, as an alternative to Kohlberg's justice-based system. Prosocial moral reasoning is reasoning about moral dilemmas in which one person's needs conflict with those of others in situations in which social rules or norms are unclear or nonexistent. For example, a child faced with the dilemma of deciding whether or not to intervene when a friend is being teased might run the risk of becoming a target of the bullies too. Such a child might engage in prosocial moral reasoning when deciding on a course of action.

Research has shown that from childhood to early adulthood, prosocial reasoning based on personal reflection about consequences and on internalized values and norms increases with age, whereas reasoning based on stereotypes such as "it's nice to help" decreases with age (Eisenberg & Morris, 2004).

Prosocial behavior also typically increases from childhood through adolescence (Eisenberg & Morris, 2004). This is associated with positive outcomes. For instance, prosocial behavior is associated with declines in externalizing behaviors such as aggression, deviant peer association, risky sexual behavior, and delinquency. It is also associated with fewer reported internalizing symptoms such as emotional problems, depression, and negative emotionality (Memmott-Elison et al., 2020), and this effect is strongest for those teens experiencing greater emotional distress (Schacter & Margolin, 2019).

Parents play a role in this; parents who are warm and sympathetic, and use prosocial reasoning themselves are more likely to have teens who behave in prosocial ways (Carlo et al., 2011; Padilla-Walker et al., 2016). Girls tend to show more prosocial behavior and empathic concern than boys (Landazabal, 2009; Van der Graaf et al., 2014), and this difference becomes more pronounced in adolescence (Eisenberg et al., 2006). This may be in part because girls' development follows a somewhat earlier timeline (Van der Graaff et al., 2018). However, another contributing factor may be because parents of girls emphasize social responsibility more than parents of boys do. This has been validated in Australia, the United States, Sweden, Hungary, Czech Republic, Bulgaria, and Russia (Flannagan et al., 1998).

Peers also matter. Although generally most people conceptualize peer pressure as negative, peers may also reinforce positive prosocial development in each other (Farrell et al., 2017; Lee et al., 2017). Experiments show that peer feedback about the value of prosocial behavior can, depending on whether the peer group is perceived as supporting or disliking such behavior, increase or decrease the occurrence of prosocial behavior (Hoorn et al., 2016), and this is particularly true when peers are considered to be high status (Choukas-Bradley et al., 2015).

Prosocial behavior does not just help the recipient; it is beneficial for the actor as well. Cross-cultural data from 136 countries indicated that prosocial behavior is associated with well-being and increases in happiness (Aknin et al., 2013). Prosocial behavior also helps mitigate the negative effects of stress by influencing emotional responses, allowing people to retain positive affect and dampening negative emotional responses (Raposa et al., 2016). Volunteering, a common form of prosocial behavior, is also associated with benefits. Students who do volunteer work tend to be more engaged in their communities, to have a

higher degree of self-understanding and commitment to others (Eccles, 2004), and to have better academic and civic outcomes (Schmidt et al., 2007). The effects of community service also apply to inner-city, racial-minority youth (Chan et al., 2014), suggesting that intervention programs promoting community service might be an important means by which to promote characteristics associated with positive development.

# Educational and Vocational Issues

School is a central organizing experience in most adolescents' lives. Some adolescents, however, experience school not as an opportunity but as one more hindrance on the road to adulthood.

Among the 35 member countries of the Organization for Economic Cooperation and Development (OECD, 2008), graduation rates vary; for example, 15 percent in Turkey and 62 percent in Iceland. The United States, with an average of 12.7 years of schooling, is on the high end of this international comparison. In the 2016–2017 academic year, the 4-year graduation rate for US public high school students hit a high of 84.6 percent (National Center for Education Statistics, 2019). However, despite our wealth and technological sophistication, US adolescents remain solidly in the middle with respect to academics. Compared to other countries, US students score above average in scientific literacy and reading and below average in math (OECD, 2019).

Let's look at influences on academic achievement and then at young people who drop out. Finally, we'll consider planning for higher education and vocations.

## ACADEMIC ACHIEVEMENT

In adolescence, such factors as parenting practices, socioeconomic status, and the quality of the home environment influence the course of school achievement. Other factors include gender, ethnicity, peer influence, quality of schooling, and students' belief in themselves.

**Student Motivation and Self-Efficacy** In Western countries, particularly the United States, educational practices are based on the assumption that students are, or can be, motivated to learn. Educators emphasize the value of intrinsic motivation—the student's desire to learn for the sake of learning—because research has shown this orientation is associated with academic achievement (Cerasoli et al., 2014).

In the United States, where opportunities exist for many children, personal motivation can have a strong effect on how much children learn. Future-oriented cognitions—hopes and dreams about future jobs—are related to greater achievement as well as participation in extracurricular activities. It may be that future-oriented cognitions are helpful in part because they motivate participation in activities that relate to later success (Beal & Crockett, 2010). Unfortunately, many US students are not self-motivated, and motivation often declines as they enter high school (Eccles, 2004; Evans et al., 2018).

In developing countries, issues of motivation pale in the light of social and economic barriers to education: inadequate or absent schools, the need for child labor to support the family, barriers to schooling for girls, and early marriage (Larson & Wilson, 2004). In many cultures, education is based on such factors as duty (India), submission to authority (Islamic countries), and participation in the family and community (sub-Saharan Africa). In the countries of east Asia, students are expected to learn to meet

- List Kohlberg's levels and stages?
- Evaluate Kohlberg's theory with regard to the role of emotion and socialization, parent and peer influences, and cross-cultural validity?
- Describe the ethics of autonomy, community, and divinity, and how they vary across cultures?
- Discuss individual differences in prosocial behavior, such as volunteering?



Students who take responsibility for their own learning are likely to do well in school.  
Purestock/Getty Images

### **self-efficacy**

Sense of one's capability to master challenges and achieve goals.

family and societal expectations. Learning is expected to require intense effort, and students who fail or fall behind feel obligated to try again. This expectation may help explain why, in international comparisons in science and math, east Asian students consistently surpass US students.

Students high in academic **self-efficacy**—who believe that they can successfully achieve academic goals—are also likely to do well in school (Komarraju & Nadler, 2013). So, for example, after failing a test, a student with high self-efficacy might conclude that they didn't study enough and that to do well in future tests, they should study more. A student with low self-efficacy, by contrast, might conclude that the material was too hard or the test was unfair, a belief system that undermines work ethic and motivation. Similarly, students' beliefs about their ability to self-regulate their learning (Zuffianò et al., 2013) as well as their actual levels of self-discipline (Duckworth & Seligman, 2005) impact academic achievement.

**Gender** Reading tests conducted on 15-year-olds in 72 countries show an advantage for girls. Although gender differences in science are small, boys score slightly higher on math assessments, and girls score slightly higher on science assessments (OECD, 2019).

Why might we expect gender differences? As with all aspects of development, research points to interacting biological and environmental contributions. Male and female brains show some differences in structure and organization, and these differences tend to become more pronounced with age. Girls have more gray matter, and their growth of gray matter peaks earlier. Their neurons also have more connections (Halpern et al., 2007). The brain structure of girls appears to better integrate verbal and analytic tasks (which occur in the left hemisphere) with spatial and holistic tasks (which occur in the right hemisphere) (Ingalhalikar et al., 2014).

On average, boys have bigger brains (Ruigrok et al., 2014). Boys also have more connective white matter (Ingalhalikar et al., 2014). Boys' brains seem to be optimized for activity within each hemisphere: Their brains are more modular and seem to show an advantage for visual and spatial performance (Halpern et al., 2007; Ingalhalikar et al., 2014). Earlier reports about sex differences in the size of the corpus callosum (a band of nerve fibers connecting both hemispheres of the brain) appear to be an artifact of overall brain size (Luders. et al., 2014).

Science continues to search for the ways in which boys' and girls' academic abilities differ and the reasons those differences exist. As changes in attitudes and perceptions open opportunities, the consequences of the structural differences seem to be shrinking. For example, in 1970, only 14 percent of PhDs in biology and 8 percent of PhDs in mathematics and statistics were granted to women. By 2006, the rates rose to 46 and 32 percent, respectively (Hyde & Mertz, 2009). By 2016, 54.1 percent of PhDs in biology and 37.8 percent of PhDs in mathematics and computer science were held by women. Overall, 52.1 percent of doctoral degrees across all fields of study were awarded to women (Okahana & Zhou, 2017).

*Students learn more when they are asked to read materials in a harder-to-read font. The additional processing required to decode the words helps the material stick better (Diemand-Yauman et al., 2011).*



**Technological Influences** Approximately 95 percent of teens have or have access to a smartphone, a 20 percent increase since 2014–2015. Eighty-eight percent of teens report having access to a desktop or laptop computer, and 45 percent report being on the internet “almost constantly” (Anderson & Jiang, 2018).

The expansion of technology and the major role it plays in children's lives have affected learning. Teachers often ask students to conduct research online as well as to access (79 percent) and submit (76 percent) homework and assignments online (Purcell et al., 2013). These trends accelerated during the COVID-19 pandemic. Approximately 1.5 billion children and teens were affected by school lockdowns and were forced to switch to remote learning utilizing technology (World Health Organization, 2020).

Another primary concern involves the tendency to multitask while using electronic devices. Adolescents, who have grown up with portable electronic media at their fingertips, are particularly prone to multitasking (Voorveld & van der Goot, 2013). Studies show that more than 25 percent of adolescents' media consumption occurs using two media types simultaneously (Rideout et al., 2010). Adolescents may believe that

they are producing high-quality work while texting with friends or listening to music, but evidence suggests the opposite. Students given access to the internet during class do not process what was presented as well and perform more poorly than students without access (Greenfield, 2009).

Moreover, there are indications that repeated multitasking may affect later performance, and these potential deficits in executive function may have far-reaching implications in school. Research has demonstrated that adolescents who frequently multitask using media report more problems staying focused, inhibiting inappropriate behavior, and switching effectively between tasks (Baumgartner et al., 2014). Moreover, multitasking in adolescents is associated with poorer academic performance on standardized English and math tests and decreased working memory capacity (Cain et al., 2016).

**Parent and Peer Influences** Family and school experiences are subject to a phenomenon referred to as spillover, wherein experiences in different contexts influence each other (Grzywacz et al., 2002). For example, stress at home has been shown to predict problems with school attendance and learning; conversely, problems with attendance and learning contribute to family stress (Flook & Fuligni, 2008).

Parental involvement in academic activities is a predictor of which teens will do well academically (Castro et al., 2015), and this is particularly true for teens from lower socioeconomic classes (Benner et al., 2014). Teens who do well academically have parents who read in the home, hold high academic expectations for their child, communicate to their children about school, and are supportive of their child's learning (Boonk et al., 2018). Parents' educational level and family income also affect educational attainment, and the performance difference between wealthy and poor families has grown larger in the last few decades (Reardon, 2013).

Peer influences on motivation are also important. Generally, academically engaged students associate with peers who are also academically engaged (Veronneau & Dishion, 2011), and, especially for girls, this predicts later performance (Crosnoe et al., 2003; Riegle-Crumb et al., 2006). The quality of peer relationships also seems to be important. Socially competent students who are liked by their peers tend to be more motivated and do better in school. Those students who do poorly are more likely to be rejected or bullied (Wentzel, 2017; Veronneau et al., 2010; Nakamoto & Schwartz, 2010).

**Race and Ethnicity** Children of minority status, while sharing many common developmental influences with their majority status peers, are exposed to additional potentially negative influences such as discrimination and racism (Garcia-Coll et al., 1996). Also, in the United States, minority status is generally correlated with poverty, and socioeconomic status in turn is strongly associated with school achievement. Thus, we might expect ethnicity to be an important factor. This is indeed the case. High school graduation rates in 2018–2019 were highest for Asian Americans (93 percent), followed by Whites (89 percent), Hispanics (82 percent), Blacks (80 percent), and Native Americans/Alaska Natives (74 percent) (Irwin et al., 2021).

Why are poor and minority adolescents more likely to drop out? Reasons include low teacher expectations, differential treatment of these students, less teacher support than at the elementary level, and the perceived irrelevance of the curriculum to culturally underrepresented groups. The transition to high school for African American and Latino students seems to be most risky for those students transitioning from smaller, more supportive junior high schools with significant numbers of minority peers to larger, more impersonal high schools with fewer minority peers (Benner & Graham, 2009).

**The School** The quality of schooling strongly influences student achievement. A good middle or high school has an orderly and safe environment, adequate material resources, a stable teaching staff, and a positive sense of community. The school culture places a strong emphasis on academics and fosters the belief that all students can learn. It also offers opportunities for extracurricular activities, which keep students engaged and pre-



*It is important to think not just about the individual contributions to behavior but also about the systemic influences on it. For example, some schools focus and invest more in police and school securitization, criminalize student misbehavior, and disinvest in school and community support services. Schools such as these subsequently tend to have students who are more violent and have higher levels of substance abuse (Prins et al., 2022). People become as you treat them.*



## checkpoint can you ...

- Explain how schools in various cultures motivate students to learn?
- Assess the influences of personal qualities, SES, gender, ethnicity, parents, and peers on academic achievement?
- Give examples of educational practices that can help high school students succeed?

vent them from getting into trouble after school. Teachers trust, respect, and care about students and have high expectations for them as well as confidence in their own ability to help students succeed (Eccles, 2004).

Adolescents are more satisfied with school if allowed to participate in making rules, if they feel support from teachers and other students (Samdal & Dür, 2000), and if the curriculum and instruction are meaningful and appropriately challenging and fit their interests, skill level, and needs (Eccles, 2004). In part, the positive effects of a school are a function of the unique peer culture—including both how students relate to each other and what they perceive the academic culture of the school to be (Lynch et al., 2013). High teacher expectations are the most consistent positive predictor of students' goals and interests, and negative feedback is the most consistent negative predictor of academic performance and classroom behavior (Wentzel, 2002).

### DROPPING OUT OF HIGH SCHOOL

Education is one of the most powerful ways in which to reduce poverty and promote health, gender equality, and well-being. Across the world, each year of additional education results in a 9 percent rise in income (Psacharopoulos & Patrinos, 2018). Unfortunately, access to educational opportunities varies widely.

There is some good news. More children are going to school, and gender disparities in educational access are much smaller than they used to be. High school is attended by over 50 percent of children in all regions of the world except for some areas of sub-Saharan Africa. Still, work remains to be done. In 2014, 202 million adolescents were not in high school. In low-income countries, only 35 percent of youth complete high school. By contrast, the completion rate is 96 percent in high-income countries. Wars and conflict have an influence as well. More than a third of children and teens who are not in school are in conflict-ridden areas of the world (World Bank, 2018). Likewise, the COVID-19 epidemic disrupted schooling, and in early 2020, estimates were that schools were closed for approximately 80 percent of schoolchildren and adolescents across the world (Van Lancker & Parolin, 2020).

More US youths are completing high school than ever before. The percentage of those who drop out, known as the status dropout rate, includes all people in the 16- to 24-year-old age group who are not enrolled in school and who have not completed a high school program, regardless of when they left school. In 2019, the status dropout rate for this group was 5.1 percent. Average dropout rates are lower for White students (4.1 percent) than for both Blacks (5.6 percent) and Hispanics (7.7 percent) (Irwin et al., 2021).

There are consequences for both society and individuals for dropping out. Society suffers when young people do not finish school. Dropouts are more likely to be unemployed or to have low incomes, to end up on welfare, to have poor health, and to become involved with drugs, crime, and delinquency (Irwin et al., 2021; Sum et al., 2009).

### PREPARING FOR HIGHER EDUCATION OR VOCATIONS

In this section, we address the development of career goals. We also look at how young people decide whether to go to college and, if not, how they enter the world of work.

**Gender and Career Choice** Women receive more than half of all undergraduate degrees in biology, chemistry, and math. However, they are underrepresented—earning only 20 percent of degrees—in computer science, engineering, and physics (Cheryan et al., 2017).

While the reasons for this are varied, one factor is gender stereotyping, which still influences vocational choice. Young men and women in the United States are now equally likely to plan careers in math and science. However, women are still more likely to go into fields such as nursing, social welfare professions, and teaching (Eccles, 2004). Much the same is true in other industrialized countries (OECD, 2021). Another related factor may be workplace discrimination. Women working in computers and in workplaces where there are more men than women, and women with higher degrees report greater gender inequities at work. Moreover, when asked why there are fewer women than men in science, technology, engineering, and math careers, women are more likely than men to attribute the gender gap in employment to sexism and discrimination at work (Funk & Parker, 2018).

Still another reason for gender disparities may be that those individuals who are high in both mathematical and verbal abilities—of whom more are female—have a wider variety of career options available to them. These individuals are less likely to pursue careers in science, technology, engineering, or mathematical areas (Wang et al., 2013). Moreover, the educational system itself may act as a brake on vocational aspirations. Students who can memorize and analyze tend to do well academically. Students whose strength is in creative or practical thinking—areas critical to success in certain fields—rarely get a chance to show what they can do (Sternberg, 1997). Recognition of a broader range of intelligences and more flexible teaching and career counseling could allow more students to meet their educational goals.



*Students whose strength is in creative thinking frequently don't get a chance to show what they can do. More flexible teaching and career counseling could allow more students to make the contributions of which they are capable.*

Jacob Lund/Shutterstock

**Guiding Students Not Bound for College** Adolescents may decide to forgo college for a variety of reasons. Some young adults have financial constraints that prevent them from attending college despite their desire to do so. A second smaller group is composed of young people who have the financial means to go to college as well as the academic ability but prefer to begin working and earning money. The remainder of non-college-bound young adults give a wide variety of reasons for their decision not to attend college (Bozick & DeLuca, 2011).

Most industrialized countries offer guidance to non-college-bound students, but the United States lacks coordinated policies to help non-college-bound youth make a successful transition from high school to the labor market. Young people not bound for college must get training on the job or in community college courses. Many, ignorant about the job market, do not obtain the skills they need. Others take jobs beneath their abilities. Some do not find work at all (National Research Council, 1993).

**Adolescents in the Workplace** In the United States, about 20 percent of high school students are employed during a given school year (Child Trends Databank, 2019), and the vast majority of adolescents are employed at some time during high school, mostly in service and retail jobs. Researchers disagree over whether part-time work is beneficial to high school students (by helping them develop real-world skills and a work ethic) or detrimental (by distracting them from long-term educational and occupational goals).

How much students work matters: Those who work more than 20 hours a week generally suffer academically and are more likely to drop out of school (Warren & Lee, 2003). However, research suggests that this association is not causal and is a consequence of the fact that those students who are poor achievers may prefer to work more hours (Staff et al., 2010). Some data, however, suggest that while working may not affect the academic performance in high school, it may nonetheless lower the probability of going to college (Lee & Orazem, 2010).

### checkpoint can you...

- Discuss influences on educational and vocational aspirations and planning?

# summary and key terms

## Adolescence

- Adolescence, in modern industrial societies, is the transition from childhood to adulthood. It lasts from about age 11 until 19 or 20.
- Early adolescence is full of opportunities for physical, cognitive, and psychosocial growth but also of risks to healthy development. Risky behavior patterns, such as drinking alcohol, drug abuse, sexual and gang activity, and use of firearms, tend to increase throughout the teenage years, but most young people experience no major problems.

**adolescence** (321)

## PHYSICAL DEVELOPMENT

### Puberty

- Puberty is triggered by hormonal changes. Puberty takes about 4 years, typically begins earlier in girls than in boys, and ends when a person can reproduce. However, the timing of these events varies considerably.
- Puberty is marked by two stages: (1) the activation of the adrenal glands and (2) the maturing of the sex organs a few years later.
- During puberty, both boys and girls undergo an adolescent growth spurt. The reproductive organs enlarge and mature, and secondary sex characteristics appear.
- A secular trend toward earlier attainment of adult height and sexual maturity began about 100 years ago, probably because of improvements in living standards.
- The principal signs of sexual maturity are production of sperm (for males) and menstruation (for females).

**puberty** (321)

**primary sex characteristics** (322)

**secondary sex characteristics** (323)

**adolescent growth spurt** (323)

**spermarche** (323)

**menarche** (323)

**secular trend** (325)

## The Adolescent Brain

- The adolescent brain is not yet fully mature. It undergoes a second wave of overproduction of gray matter, especially in the frontal lobes, followed by pruning of excess nerve cells. Continuing myelination of the frontal lobes facilitates the maturation of cognitive processing.
- Because the limbic areas of the brain mature first and the frontal lobes mature more slowly, this predisposes adolescents to impulsivity and risk-taking.

## Physical and Mental Health

- For the most part, the adolescent years are relatively healthy. Health problems often are associated with poverty or lifestyle.
  - Many adolescents do not engage in regular vigorous physical activity.
  - Many adolescents do not get enough sleep because the high school schedule is out of sync with their natural body rhythms.
  - Concern with body image, especially among girls, may lead to eating disorders.
  - Three common eating disorders in adolescence are anorexia nervosa, bulimia nervosa, and binge eating disorder. All can have serious long-term effects. Anorexia and bulimia affect mostly girls and young women. Outcomes for bulimia tend to be better than for anorexia.
  - Adolescent substance use has lessened in recent years; still, drug use often begins as children move into middle school.
  - Marijuana, alcohol, and tobacco are the most popular drugs with adolescents. All involve serious risks.
  - The prevalence of depression increases in adolescence, especially among girls.
  - Leading causes of death among adolescents include motor vehicle accidents, firearm use, and suicide.
- body image** (331)
- anorexia nervosa** (332)
- bulimia nervosa** (333)
- binge eating disorder** (333)
- substance abuse** (334)
- substance dependence** (334)
- binge drinking** (335)

# COGNITIVE DEVELOPMENT

## Aspects of Cognitive Maturation

- Adolescents who reach Piaget's stage of formal operations can engage in hypothetical-deductive reasoning. They can think in terms of possibilities, deal flexibly with problems, and test hypotheses.
- Because environmental stimulation plays an important part in attaining this stage, not all people become capable of formal operations, and those who are capable do not always use them.
- Adolescents illustrate their cognitive immaturity in a number of characteristic ways, including the imaginary audience, in which they believe everyone is focused upon them, and the personal fable, in which they believe they are special and not subject to the same rules that govern the rest of the world.
- Vocabulary and other aspects of language development, especially those related to abstract thought such as social perspective-taking, improve in adolescence.
- According to Kohlberg, moral reasoning is based on a developing sense of justice and growing cognitive abilities. Kohlberg proposed that moral development progresses from external control to internalized societal standards to personal, principled moral codes.
- Important cultural values and goals are reflected in the dominant ethical system of a culture. Three key ethical systems have been identified: the ethic of autonomy, the ethic of community, and the ethic of divinity.

**formal operations** (339)

**hypothetical-deductive reasoning** (339)

**imaginary audience** (341)

**personal fable** (341)

**preconventional morality** (343)

**conventional morality (or morality of conventional role conformity)** (343)

**postconventional morality (or morality of autonomous moral principles)** (343)

## Educational and Vocational Issues

- Self-efficacy beliefs, parental practices, cultural and peer influences, gender, and quality of schooling affect adolescents' educational achievement.
- Although most Americans graduate from high school, the dropout rate is higher among poor, Hispanic, and African American students. However, this racial/ethnic gap is narrowing. Active engagement in studies is an important factor in keeping adolescents in school.
- Educational and vocational aspirations are influenced by several factors, including self-efficacy and parental values. Gender stereotypes have less influence than in the past.
- High school graduates who do not immediately go on to college can benefit from vocational training.
- Part-time work seems to have both positive and negative effects on educational, social, and occupational development. The long-term effects tend to be best when working hours are limited.

**self-efficacy** (346)

# chapter 12

## outline

The Search for Identity  
Sexuality  
Relationships with Family, Peers,  
and Adult Society  
Antisocial Behavior and Juvenile  
Delinquency

## learning objectives

Discuss identity formation in adolescence.  
Describe adolescent sexuality.  
Characterize changes in adolescents' relationships with family and peers.  
Describe adjustment problems of adolescents and strategies for intervention and risk reduction.

# Psychosocial Development in Adolescence



Hill Street Studios/DigitalVision/Getty Images

### did you know?

- Adolescence is a cultural invention, and not all cultures have “teenagers.”
- Sex education programs that encourage *both* abstinence and safe sexual practices are more effective in delaying sexual initiation than abstinence-only programs.
- Most adolescents say they have good relationships with their parents.

*In this chapter, we turn to psychosocial aspects of the quest for identity. We discuss how adolescents come to terms with their sexuality. We consider how teenagers’ burgeoning individuality expresses itself in relationships with parents, siblings, peers, and friends. We examine sources of antisocial behavior and ways of reducing the risks to adolescents to make it a time of positive growth and expanding possibilities.*



**D**efining myself, as opposed to being defined by others, is one of the most difficult challenges I face.

—Carol Moseley Braun (b. 1947)

## The Search for Identity

The search for **identity**—which Erikson (1968) defined as a coherent conception of the self, made up of goals, values, and beliefs to which the person is solidly committed—comes into focus during the teenage years.

### IDENTITY VERSUS IDENTITY CONFUSION

The chief task of adolescence, said Erikson (1968), is to confront the crisis of **identity versus identity confusion**, or identity versus role confusion, so as to become a unique adult with a coherent sense of self and a valued role in society. Identity, according to Erikson, forms as young people resolve three major issues: the choice of an occupation, the adoption of values to live by, and the development of a satisfying sexual identity.

According to Erikson (1982), **psychosocial moratorium**, the time-out period that adolescence provides, allows young people to search for commitments to which they can be faithful. Adolescents who resolve the identity crisis satisfactorily develop the virtue of **fidelity**: sustained loyalty, faith, or a sense of belonging to a loved one or to friends and companions. Fidelity also can mean identification with a set of values, an ideology, a religion, a political movement, a creative pursuit, or an ethnic group.

Erikson saw identity or role confusion as the prime danger of this stage. A failure to form a coherent sense of identity can greatly delay reaching psychological adulthood. Some degree of identity confusion is normal. According to Erikson, it accounts for the seemingly chaotic nature of much adolescent behavior and for teenagers' painful self-consciousness. Cliquishness and intolerance of differences, both hallmarks of the adolescent social scene, are defenses against identity confusion.

Erikson's theory describes male identity development as the norm. According to Erikson, a man is not capable of real intimacy until he has achieved a stable identity, whereas women define themselves through marriage and motherhood.

### IDENTITY STATUS

James E. Marcia (1966) distinguished four types of identity status. The four categories differ according to the presence or absence of **crisis** and **commitment**, the two elements Erikson saw as crucial to forming identity. Marcia defined crisis as a period of conscious decision making. Crisis, within the context of Erikson's theories, does not refer to a stressful event such as losing your job or not being able to pay your bills. Rather, it refers to the process of grappling with what to believe and who to be.

Commitment, the other aspect of identity formation, involves a personal investment in an occupation or ideology (system of beliefs). Commitments can be held after they have been deeply considered or after a crisis, or can be adopted

#### identity

According to Erikson, a coherent conception of the self, made up of goals, values, and beliefs to which a person is solidly committed.

#### identity versus identity confusion

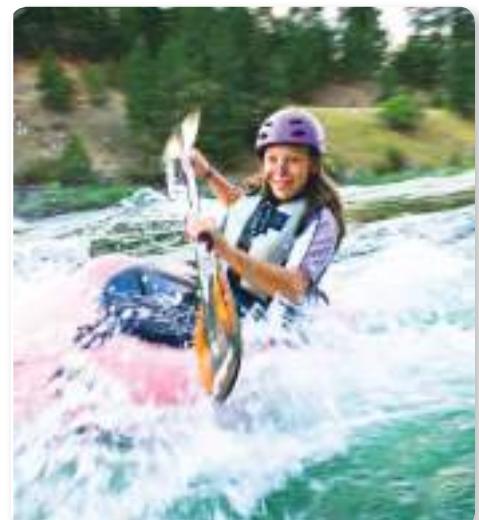
Erikson's fifth stage of psychosocial development, in which an adolescent seeks to develop a coherent sense of self, including the role they are to play in society. Also called *identity versus role confusion*.

#### psychosocial moratorium

A time, usually during adolescence, during which society allows individuals to address psychosocial crises free from the full responsibilities of adult life.

#### fidelity

Sustained loyalty, faith, or sense of belonging that results from the successful resolution of Erikson's *identity versus identity confusion* psychosocial stage of development.



Mastering the challenge of a whitewater course may help this adolescent assess her abilities, interests, and desires.

Michael DeYoung/Blend Images

#### crisis

Marcia's term for period of conscious decision making related to identity formation.

#### commitment

Marcia's term for personal investment in an occupation or system of beliefs.

*Identity formation includes attitudes about religion. Research indicates that 84 percent of US teens aged 13 to 17 believe in God, and about half of them say religion is very important to them (Lippman & McIntosh, 2010).*



without much thought put into them. Here is a sketch of young people in each identity status.

- **Identity diffusion** (no commitment, no crisis). Mark has not seriously considered options and has avoided commitments. He is unsure of himself and tends to be uncooperative. His parents do not discuss his future with him; they say it is up to him. People in this category tend to be unhappy and often lonely.
- **Foreclosure** (commitment without crisis). Isabella has made commitments by uncritically accepting her family's plans for her life. She is self-assured, but she becomes dogmatic when her opinions are questioned. She has close family ties and is obedient.
- **Moratorium** (crisis with no commitment yet). Marcus is actively grappling with his identity and trying to decide for himself who he wants to be and the path he wants his life to take. He is not only lively, talkative, and self-confident but also anxious and fearful. He will probably come out of his crisis with the ability to make commitments and achieve identity.
- **Identity achievement** (crisis and commitment). After a crisis period, Olivia made thoughtful choices and expressed strong commitment to them. Research in a number of cultures has found people in this category to be more mature and more socially competent than people in the other three.

#### identity diffusion

Identity status, described by Marcia, that is characterized by absence of commitment and lack of serious consideration of alternatives.

#### foreclosure

Identity status, described by Marcia, in which a person who has not spent time considering alternatives (that is, has not been in crisis) is committed to other people's plans for their life.

#### moratorium

Identity status, described by Marcia, in which a person is currently considering alternatives (in crisis) and seems headed for commitment.

#### identity achievement

Identity status, described by Marcia, that is characterized by commitment to choices made following a crisis, a period spent in exploring alternatives.

#### sexual orientation

Focus of consistent sexual, romantic, and affectionate interest, including heterosexual, homosexual, bisexual, pansexual, or asexual.

#### LGBTQ+

An acronym for lesbian, gay, bisexual, trans, queer and/or questioning, and others.

#### transgender people

Individuals whose gender identity (a social and psychological construct) is different from their sex (a biological construct).

## GENDER DIFFERENCES IN IDENTITY FORMATION

Some earlier research supports Erikson's view that for women, identity and intimacy develop together (Fischer, 1981; Hodgson & Fischer, 1979). However, more recent research has indicated there are few gender differences in identity status (Kroger, 2003). Most notably, a meta-analysis using data from studies conducted in the 1970s and 1980s showed that identity status and intimacy were associated with each other in both men and women but that the relationship was more robust for men (Arseth et al., 2009). More recent research conducted in the late 1990s to early 2000s on German young adults also found no gender differences (Beyers & Seiffge-Krenke, 2010). Similarly, other research has failed to find gender differences in the link between adolescent romantic attachment and identity exploration (Kerpelman et al., 2012). Changes in social structure and the increased role of women in the workforce may have led to these reductions in gender differences.

## IDENTITY DEVELOPMENT IN SEXUAL-MINORITY YOUTH

In adolescence, a person's **sexual orientation**, the direction of their erotic interests, becomes more clear. As with other important areas of development, teens may hold varying identity statuses as they form their sexual identity. The term **LGBTQ+**, an acronym for "lesbian, gay, bisexual, transgender, queer and/or questioning, and others," has been developed to encompass the diversity of sexual identities now recognized.

Most gay, lesbian, and bisexual youth begin to identify as such between the ages of 12 and 17 years. Gay and lesbian youth who experience rejection and low support for their sexual orientation from their parents after coming out are more likely to adopt a negative view of their sexuality (Bregman et al., 2013). For example, family rejection is associated with low self-esteem, depression, substance abuse, and suicidal ideation (Ryan et al., 2010), perhaps because parents' negative views about homosexuality are incorporated into teens' self-image (Baiocco et al., 2016). Overall, sexual minority youth who do not successfully integrate their sexual identity in their self-concept are at risk for anxiety, depression, or conduct problems (Rosario et al., 2011).

**Transgender** is a term that refers to individuals whose biological sex assigned at birth and gender identity are not the same. Although some transgender people identify as male or female, others may feel neither fully male or female. Transgender and other gender-nonconforming people may or may not seek medical assistance, including gender-affirming hormone therapy or surgery, to move closer toward their desired presentation. Because being transgender is relatively rare—somewhere between 0.39 and 0.6 percent

of the US population (Flores et al., 2017; Meerwijk & Sevelius, 2017)—it is likely that many transgender children and youth do not have access to transgender adult role models in the same way other children have access to adult role models. Moreover, because transgender as a concept has been controversial, it is often not discussed in school-based sex education programs (Boskey, 2014).

Still, most transgender children from a young age know something is different. Although researchers report some children making statements about their gender being different from their biological sex as early as 2 years of age (Diamond et al., 2011), most transgender children begin to articulate their feelings about gender at about 3 to 4 years of age (Boskey, 2014). However, it may take a while to develop a full understanding. In a retrospective study of transgender adolescents, all reported feeling different from other people at an average age of 7½ years but not coming to a full realization of being transgender until 13 to 15 years of age (Grossman et al., 2005).

## RACIAL AND ETHNIC DIFFERENCES IN IDENTITY FORMATION

For a European American young person growing up in a predominantly White culture, the process of ethnic identity formation is not particularly troublesome. However, for many young people in minority groups, race or ethnicity is central to identity formation. Following Marcia's model, some research has identified four ethnic identity statuses (Phinney, 1998; Box 1 includes representative statements by minority young people in each status).

Research shows evidence of the existence of these categories, with the highest proportion of adolescents falling into the moratorium status. In addition, the proportion of people in achieved status rises throughout adolescence and into adulthood, and those people who attain identity achievement are more likely to view race as central to their identity (Yip et al., 2006).

More recent research has shifted toward examining longitudinal change in and the consequences of exploration and commitment to one's ethnic group (Phinney & Ong, 2007). Exploration of the meaning of ethnicity, which increases in middle adolescence and often reflects the transition to a more ethnically diverse high school, is an important variable (French et al., 2006). Friends are likely to report similar levels of identity exploration and commitment, especially if they are both ethnic minority members and if they frequently discuss issues of race or ethnicity (Syed & Juan, 2012). Girls may

### BOX 1 Representative Quotations from Each Stage of Ethnic Identity Development

#### *Diffusion*

"Well, yeah, my parents are both Latinos, so I guess I probably am too." (Latina female)

#### *Foreclosure*

"I am really happy that I am Chinese. My parents have always made me go to Chinese classes and participate in Chinese cultural events, so that's just how I've always been." (Chinese male)

#### *Moratorium*

"I've heard people say that racism doesn't exist anymore, but I disagree. I've had some experiences that have really made me stop and think. I haven't figured it out yet, but I know that being Black is different than being White." (Black female)

#### *Achieved*

"My parents are first-generation immigrants, and I was born here. When I think about myself, I think I am a mix of their culture and of American culture too. I think it helps me be flexible in social situations: I know that people are different in many ways, but also the same in many ways." (Latino male)

Source: Adapted from Phinney (1998), p. 277, Table 2.

undergo the process of identity formation earlier than boys (Portes et al., 2000). For example, one study showed that over a 4-year period, Latina girls went through exploration, resolution, and affirmation of positive feelings about their ethnic identities, whereas boys showed increases only in affirmation (Umana-Taylor et al., 2009).

Generally, research has found that developing a sense of ethnic identity is beneficial. Several reviews have found that ethnic identity development has been related to higher self-esteem and better well-being, mental and physical health, and academic outcomes, especially for African American adolescents (Smith & Silvia, 2011; Rivas-Drake et al., 2014).

Perceived discrimination during the transition to adolescence can interfere with positive identity formation and lead to conduct problems or depression. As an example, perceptions of discrimination are associated with depressive symptoms, alienation, and a drop in academic performance in Chinese American adolescents (Benner & Kim, 2009) and decreases in self-esteem and increases in depression in Asian American, Black, and Latino teens (Greene et al., 2006). However, teens can be buffered from the effects of perceived discrimination by a variety of protective factors, including nurturant, involved parenting; secure attachment with parents; prosocial friends; and strong academic performance (Myrick & Martorell, 2011; Brody et al., 2006).

#### cultural socialization

Parental practices that teach children about their racial/ethnic heritage and promote cultural practices and cultural pride.

**Cultural socialization** includes practices that teach children about their racial or ethnic heritage, promote cultural customs and traditions, and foster racial/ethnic and cultural pride. For example, think about the holidays you celebrate. Participating in those traditions and rituals was part of your cultural socialization, and it impacts identity formation. Adolescents who have experienced cultural socialization tend to have stronger and more positive ethnic identities than those who have not (Juang & Syed, 2010; Hughes et al., 2006). Note that in some cases, cultural socialization is not positive in nature. For example, in some African American families, some ethnic socialization practices involve preparing children to experience oppression and racism or emphasizing the need to exercise caution in interactions with majority-group members (Else-Quest & Morse, 2015).

## CULTURAL DIFFERENCES IN IDENTITY FORMATION

Culture shapes our understanding of who we are not just within the context of our parents' socialization practices but also with the influence of wider cultural values. One important dimension is captured by the cultural value of individualism-collectivism (IC). Individualistic cultures value autonomy, individual rights, self-fulfillment, independence, and personal achievement. By contrast, collectivistic cultures place more importance on relationships, interdependence, and group harmony.

In individualistic cultures, because of the strong emphasis on the self, people's self-concept is individual in nature and their personality—because it is conceptualized as something that lives within individuals—is generally stable across situations. However, in collectivistic cultures, because identity is entwined with group processes, people view themselves within the context of their relationships with others. Thus, people's personality characteristics are more fluid because whom they consider themselves to be depends in part on whom they are with at the time. Their sense of self is interdependent (Markus & Kitayama, 1991).

The IC dimension also affects another aspect of self-construal: how people describe themselves. In one study comparing American and Indian college students, the American students were more likely to use personal trait descriptors (e.g., "nice") to describe themselves, and students from India were more likely to describe themselves in terms of their relationships (e.g., "daughter") (Dhawan et al., 1995). Similar tendencies have been found in Asian American, Mexican American, Korean, and Chinese students (Rhee et al., 1995; Trafimow et al., 1991; Dabul et al., 1995). The influence of IC on self-construal extends in surprisingly far-reaching ways, from indigenous groups in a pretechnological society to the online persona presented by modern college students in social media sites. For instance, one study showed the collectivistic Masai and Samburu traditional African people were more likely to describe themselves in terms of social relationships, whereas urban Kenyan and American college students were more likely to use nonsocial descriptors (Ma & Schoeneman, 1997).

### checkpoint can you ...

- List the three major issues involved in identity formation, according to Erikson?
- Describe four types of identity status found by Marcia?
- Discuss how gender, sexual orientation, and ethnicity affect identity formation?

# Sexuality

Seeing oneself as a sexual being, recognizing one's **sexual orientation**, and forming romantic or sexual attachments all are parts of achieving sexual identity and important milestones in the path to adult relationships.

## sexual orientation

Focus of consistent sexual, romantic, and affectionate interest, including heterosexual, homosexual, bisexual, pansexual, or asexual.

## SEXUAL ORIENTATION

Heterosexuality predominates in nearly every known culture, although the prevalence estimates of homosexual orientation varies widely depending on how it is defined and measured. Moreover, although many young people have one or more same-sex experiences, isolated experiences or even occasional attractions or fantasies do not determine sexual orientation.

In a national survey, 5 percent of 15- to 19-year-old US boys and 13 percent of girls in the same age group reported being gay, lesbian, bisexual, or something else (Guttmacher Institute, 2019). Social stigma may bias such self-reports, underestimating the prevalence of homosexuality and bisexuality. Although there is increasing acceptance of homosexuality in the United States, African American, Hispanic, and older adults are more likely to hold negative views of the orientation (Glick et al., 2015; Brown, 2017).

**Origins of Sexual Orientation** Sexual orientation seems to be at least partly genetic. For example, research has found stretches of DNA on chromosomes 7, 8, 10, and 28 that appear to be involved (Mustanski et al., 2005; Sanders et al., 2015). Researchers have found the concordance rates of monozygotic (identical) twins is always higher than that of dizygotic (fraternal) twins. However, despite having the exact same copy of genes, identical twins are not perfectly concordant for sexual orientation (Ngan & Vilain, 2014). This implies that nongenetic, environmental factors must also play a part.

One environmental influence involves biological correlates of family structure. The more older biological brothers a man has, the more likely he is to be gay (Blanchard, 2017). Each older biological brother increases the chances of homosexuality in a younger brother by 33 percent (Bogaert, 2006). Furthermore, there are indications that male babies who will later identify as gay are more likely to weigh less at birth and have mothers who experience miscarriages (VanderLaan et al., 2015; Skorska et al., 2017). These phenomena may indicate a cumulative immunelike response to the presence of successive male fetuses in the womb.

Another variable that has been implicated in sexual orientation is the 2D:4D ratio. This ratio—that of the pointer finger to the ring finger—is, through a quirk of development, affected by hormone exposure in utero. A lower 2D:4D ratio indicates high prenatal androgen exposure and is more typical of men than women. Interestingly, one meta-analysis showed that lesbian women had a significantly more masculinized 2D:4D ratio when compared to heterosexual women, suggesting androgen exposure in utero affected their sexual orientation. Gay men, by contrast, did not appear to have a different 2D:4D ratio than heterosexual men (Grimbos et al., 2010). Other research with girls who have a condition called congenital adrenal hyperplasia (CAH) also speaks to the influence of prenatal hormone exposure. Girls with CAH, who are exposed to higher than average levels of androgens in utero, are more likely to later identify as lesbian or bisexual (Bao & Swaab, 2010).

Imaging studies have found similarities of brain structure and function between homosexuals and heterosexuals of the other sex. While correlational, they are intriguing. Brains of gay men and straight women are more symmetrical, whereas in lesbians



Same-sex activity is widespread in the animal kingdom and found in animals as disparate as zebra finches, dolphins, and bonobos, a type of chimpanzee (Bailey & Zuk, 2009).



Attitudes toward sexuality have liberalized in the United States in the past 50 years. Celebrities such as Miley Cyrus, who identifies as pansexual, have become more open about their sexuality.

Mario Anzuoni/Reuters/Alamy Stock Photo

and straight men, the right hemisphere is slightly larger. Also, in gays and lesbians, connections in the amygdala, which is involved in emotion, are more typical of the other sex (Savic & Lindström, 2008). In brain imaging studies on pheromones, odors that attract mates, the odor of male sweat activated the hypothalamus in gay men much as it did in heterosexual women. Similarly, lesbian women and straight men reacted more positively to female pheromones than to male ones (Savic et al., 2005, Berglund et al., 2006).

Sexual preferences are reflected in the stimuli that activate areas of the brain associated with incentive motivation. Gay and heterosexual men show increased activation in the ventral striatum in accordance with viewing erotic stimuli—either male or female—consistent with their stated sexual orientation. Bisexual men, by contrast, show such responses to both male and female visual stimuli (Safron et al., 2017). Although bisexual women also show a mixed pattern of activation to both male and female erotic stimuli, so do most heterosexual women. Lesbians, however, show a strong preference for female erotic stimuli (Safron et al., 2018).

Approximately 2.4 percent of high school students identify as gay or lesbian, 8 percent as bisexual, and 4.2 percent as unsure of their sexual identity (Kann et al., 2018). Lesbian, gay and bisexual adolescents and young adults are at higher risk for substance use, suicide, and depression (Mongelli et al., 2019). Multiple lines of evidence have shown the negative outcomes experienced by LGBTQ+ people are caused by societal treatment of sexual minorities rather than by any direct effect attributable to sexual orientation (Morgan et al., 1993). Thus, these findings led the psychiatric profession in 1973 to stop classifying homosexuality as a mental disorder.

Gender identity also matters, and transgender youth are at an even higher risk. And as with other sexual and gender minorities, negative outcomes appear to be driven by stigma, rejection, and a lack of social support. For instance, transgender youth are more likely to be bullied, and this bullying is in turn associated with an elevated risk of suicide attempts (Goldblum et al., 2012). Transgender youth are also at elevated risk of sexual victimization, violence, depression, anxiety, and substance abuse (Johns et al., 2019; Borgogna et al., 2018; Grossman et al., 2011). Parental rejection, which is common, appears to be a particularly important risk factor (Grossman & D'Augelli, 2007; Grossman et al., 2005).

People with autism report higher rates of gender dysphoria (a mismatch between their biological sex and gender identity) than the general population (George & Stokes, 2018), although the precise reasons for this are unclear.



## checkpoint can you ...

- Discuss the prevalence of homosexuality?
- Summarize research findings regarding origins of sexual orientation?

## SEXUAL BEHAVIOR

Young people across the world are staying in school longer, more likely to use contraception, and marrying later, which has led to a greater occurrence of premarital sex across multiple countries. However, despite this trend, across 29 countries spanning sub-Saharan Africa, Latin America, the Caribbean, and Central and Southeast Asia, teens have shown declines in sexual activity and increased condom usage. Sexual activity in younger teens is higher in sub-Saharan Africa, reflecting the higher occurrence of teen marriage in those regions (Liang et al., 2019).

Similarly, American teens across all racial and ethnic groups report engaging in less sexual activity over the last decade, and this trend is particularly true for Black high school students. Still, according to national surveys, 38.4 percent of high school students report having had sexual intercourse at least once, and the proportion of sexually active teens rises with age. In 2019, 44 percent of twelfth-grade boys and 51 percent of girls in that age group reported being sexually active (Centers for Disease Control and Prevention, 2019; Figure 1).

Rates are somewhat different for White (38 percent), Black (42.3 percent), and Hispanic (41.8 percent) high school students (Centers for Disease Control and Prevention, 2020). By the age of 18 years, 65 percent of young people have had sex (Guttmacher Institute, 2018). Teenage boys historically have been more likely to be sexually experienced than teenage girls; however, trends are shifting.

Noncoital forms of sexual activity, such as oral and anal sex and mutual masturbation, are also common among teens. In one national survey, almost 25 percent of 15- to 19-year-old girls and 37.3 percent of boys had engaged in oral sex, and 8.9 percent of girls and 23.9 percent of boys had had anal sex (Habel et al., 2018). Many heterosexual teens do not regard these activities as “sex” but as substitutes for, or precursors of, sex or even as abstinence (Remez, 2000).

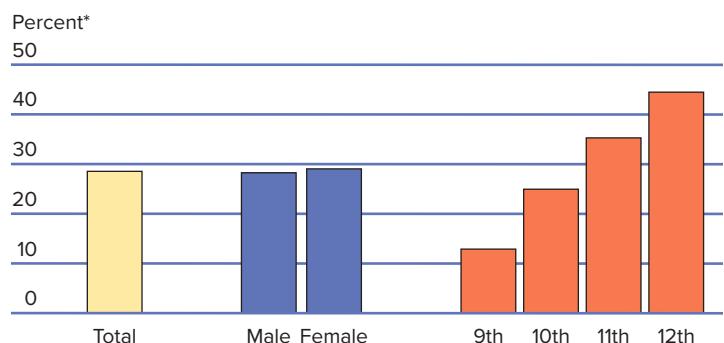
As with many areas of modern life, social media and electronics have impacted sexual behavior. In particular, **sexting**, sharing or sending sexually explicit or suggestive photos or videos to others, has been a rising concern. Estimates of how many teens either send or receive sexts vary widely. One meta-analysis found 1 in 7 teens had sent sexts, 1 in 4 teens had received a sext, and 1 in 8 teens had forwarded sexts sent to them to others, with older teens reporting higher levels (Madigan et al., 2018). Non-heterosexual teens are more likely to engage in sexting overall (Patchin & Hinduja, 2019). Girls are more likely to send sexually explicit photographs, and sending photographs is in turn associated with a great likelihood of engaging in sexual activity (Houck et al., 2014).

**Correlates of Adolescent Sexual Activity** Two major concerns about adolescent sexual activity are the risks of contracting sexually transmitted infections (STIs) and, for heterosexual activity, of pregnancy. Most at risk are young people who start sexual activity early, have multiple partners, do not use contraceptives regularly, and have inadequate information—or misinformation—about sex. Other risk factors are living in a socioeconomically disadvantaged or rural community; being Black, Hispanic, or Native American; substance use; antisocial behavior; association with deviant peers; and sexting (Centers for Disease Control and Prevention, 2017; Burrus, 2018; Meade & Iccovics, 2005; Mori et al., 2019).

Generally, an involved and engaged relationship between teens and parents is associated with a decreased risk of early sexual activity (Lee et al., 2017), and more parent-child communication is associated with delayed sexual intercourse (Parkes et al., 2011). For instance, teens who have supportive relationships with their parents are more likely to delay intercourse and to use safe sex practices when they finally do so (Deptula et al., 2010; Widman et al., 2016), and this is especially true for girls (Kincaid et al., 2012; Silva et al., 2016). For those teens in two-parent families, having fathers who know more about their friends and activities is associated with delays in sexual activity (Coley et al., 2009), whereas the absence of a father, especially early in life, is a predictor of early sexual activity (Ellis et al., 2003).

One proposed protective factor is a sense of meaning in life, which is theorized to provide protection against health risk behaviors. Meaning in life has been associated with a decreased risk of unsafe sexual activity but only in adolescent women (Brassai et al., 2011). However, religiosity, which for many people provides a sense of meaning and community, has repeatedly been associated with decreased sexual risk taking (Haglund & Fehring, 2010; Vasilenko & Espinosa-Hernández, 2019). For instance, a common reason teenagers give for not yet having had sex include that it is against their religion or morals (Abma et al., 2010).

Peer group norms exert a powerful influence on adolescent behavior. Indeed, the relationship between religiosity and decreased sexual activity may be driven in part by peers. Religious teens are less likely to be friends with peers who have positive views of sexual activity (Landor et al., 2011). On the other hand, if adolescents believe their peers are having and approve of sex or are pressuring them to have sex, then they, especially boys, may feel pressure to engage in activities they do not feel ready for (Van de Bongardt et al., 2015; Widman et al., 2016). As a teen’s number of close friends who initiate sex grows, the likelihood the teen will initiate sex also rises (Ali & Dwyer, 2011). As with other sexual behaviors, adolescents’ perception that their friends approve of their risky online sexual behaviors increases their participation in those behaviors (Sasson & Mesch, 2014).



\*Had sexual intercourse with at least one person during the 3 months before the survey  
Note: This graph contains weighted results.

### FIGURE 1

## Percentage of Students in Grades 9 through 12 Who Report They Are Sexually Active

Source: Kann et al. (2018).

### sexting

The sharing or sending of sexually explicit or suggestive photos or videos to others.

Adolescents in the United States and Europe have similar levels of sexual activity, but the United States has far higher levels of teen pregnancy. The reason? US teens are less likely to use birth control (Sedgh et al., 2015).

Condoms have been in use for at least 400 years.

### checkpoint can you ...

- Cite trends in sexual activity among adolescents?
- Identify factors that increase or decrease the risks of sexual activity?

**sexually transmitted infections (STIs)**  
Infections and diseases spread by sexual contact.

The rates of sexually transmitted infections dropped sharply in early 2020; however, they rebounded sharply later in the year. This suggests the decline in STIs was illusory and shaped more by the influence of the COVID-19 pandemic and lockdown protocols on screening, tracking, and reporting of STIs (Centers for Disease Control and Prevention, 2021).

**Contraceptive Use** In low- and middle-income countries, sexual and reproductive health care services fall far short of where they need to be to ensure adolescents and young adults have the resources they need. For example, across the globe, approximately 32 million adolescent women report wanting to avoid pregnancy, although 14 million of them do not have access to contraceptives. The provision of modern contraceptives to these young women would drop unintended pregnancies by 68 percent (Sully et al., 2020).

The best safeguard for sexually active teens is regular use of condoms, which give some protection against STIs as well as against pregnancy. Slightly over 80 percent of teenage girls and almost 80 percent of teenage boys who are having sex for the first time use a condom (Abma & Martinez, 2017). This does not necessarily ensure continued use, however. While condoms are still the most common form of contraception used, almost 50 percent of adolescent females and 40 percent of adolescent males report not using a condom during their last sexual encounter (Centers for Disease Control and Prevention, 2020).

The use of contraceptives among sexually active teenage girls in the United States has increased since the 1990s and includes the pill and new hormonal and injectable methods or combinations of methods (Abma & Martinez, 2017). In 2019, 54.3 percent of teens used a condom in their last sexual encounter, and almost 31 percent used hormonal birth control (Centers for Disease Control and Prevention, 2020). Overall, condom usage has declined slightly in recent years; however, overall contraceptive use has increased (Lindberg et al., 2021). As with sexual activity, peer influences are important. Teens who believe their peers approve of contraception are more likely to adopt their use as well (Ali et al., 2011).

Barriers to contraceptive use include lack of access, concerns about confidentiality, financial concerns, a belief they will not get pregnant, or reluctance to discuss use with a sexual partner (Hasstedt, 2018; Kusunoki & Upchurch, 2011). Less commonly, some teens may be deliberately seeking to become pregnant (Barber et al., 2015).

## SEXUALLY TRANSMITTED INFECTIONS

**Sexually transmitted infections (STIs)** are diseases spread by sexual contact. Globally, more than 1 million STIs are acquired each day (World Health Organization, 2021). Rates in the United States are higher than in other developed nations, although the majority of cases are found in developing countries (Advocates for Youth, 2010). These diseases are commonly caused by viruses or bacteria. Although bacterial disease, for the most part, can currently be treated with antibiotics, viruses are unaffected by antibiotics.

In the United States, an estimated 26 million new STIs are diagnosed each year, almost half in young men and women aged 15 to 24 years (Centers for Disease Control and Prevention, 2021). Approximately 65 million Americans have an incurable STI (Wildsmith et al., 2010). Men who have sex with other men and young women have the highest risk of contracting an STI. In young women, part of this increased risk is biological. Adolescent women produce less cervical mucus and thus are more likely to become infected during sexual encounters (Shannon & Klauser, 2018). For example, in a single unprotected sexual encounter with an infected partner, a girl runs a 1 percent risk of acquiring HIV, a 30 percent risk of acquiring genital herpes, and a 50 percent risk of acquiring gonorrhea (Alan Guttmacher Institute, 1999).

The chief reasons for the prevalence of STIs among teenagers include early sexual activity, multiple partners, and failure to use condoms or to use them regularly and correctly. Additionally, there are often barriers to sexual health services such as lack of transportation to clinics, inability to pay, conflict between school and clinic hours, and concerns about confidentiality (Centers for Disease Control and Prevention, 2019). Moreover, adolescents also differ behaviorally from older adults. For instance, their less-developed frontal lobe results in a higher likelihood of engaging in high-risk sexual behavior without considering the potential consequences (Shannon & Klauser, 2018). Despite the fact that teens are at higher risk for contracting STIs, they perceive their own personal risk as low (Wildsmith et al., 2010).

**Viral STIs** The most common STI, accounting for about half of all STI infections diagnosed in 15- to 24-year-olds each year, is human papilloma virus (HPV), or genital warts. Approximately 43 million Americans have HPV, with approximately 13 million new infections per year (Centers for Disease Control and Prevention, 2022). HPV is the leading cause of cervical cancer in women, and in low- or middle-income countries where women lack adequate reproductive health care, cervical cancer is the most common—and most deadly—cancer in women (Chibwesha & Stringer, 2019).

Almost every adult who is sexually active will eventually get HPV in the absence of vaccination (Centers for Disease Control and Prevention, 2022). The Centers for Disease Control and Prevention (2021) recommends routine vaccination for all adolescents starting at age 11 or 12. A recent meta-analysis including more than 60 million individuals from 14 high-income countries showed that even when vaccination campaigns include only women, the incidence of HPV infection drops rapidly in all risk groups (Drolet et al., 2019). In 2020, 58.6 percent of American teens received the entire series, and 75.1 percent received the first shot (Pingali et al., 2021).

Some parents avoid vaccinating their children for HPV out of a fear it might lead to increased sexual activity. However, research has shown that HPV vaccination does not lead to more or riskier sexual behavior in adolescents (Mayhew et al., 2014). Additionally, parental concerns about the safety of the vaccine are also unfounded, as multiple, large-scale studies have shown little to no evidence of adverse side effects or safety risks (Chao et al., 2012; Lu et al., 2011; Gee et al., 2011).

Another viral disease is genital herpes. Genital herpes simplex is a chronic, recurring, often painful, and highly contagious disease. Globally, more than 500 million people are infected with the herpes virus (World Health Organization, 2021). In the United States, more than 1 out of every 6 people—almost 19 million people—is infected (Centers for Disease Control and Prevention, 2021). Herpes can be fatal to a person with a deficiency of the immune system or to the newborn infant of a mother who has an outbreak at the time of delivery. Although herpes can be managed, it cannot be cured.

There are two variants: herpes simplex virus type 1 (HSV-1), which causes cold sores, and herpes simplex virus type 2 (HSV-2), which causes genital sores. Teens today are less likely to have been infected with HSV-1 because of public health education efforts such as the discouraging of shared cosmetics. However, their lack of exposure to this virus means they have not had the opportunity to form HSV-1 antibodies, which may result in a higher risk of HSV-2 if they are exposed when they become sexually active. (Bradley et al., 2013).

Hepatitis B is a virus that affects the liver, causing both acute and chronic issues that can lead to cirrhosis, liver cancer, and death. Hepatitis B has been affecting humans for at least 4,500 years, as evidence of its presence has been found in the bones of ancient humans (Mühlemann et al., 2018). Currently, it affects an estimated 296 million people globally with an additional 1.5 million new infections yearly (World Health Organization, 2021). There are approximately 18.6 million infected people in the United States. (Centers for Disease Control and Prevention, 2021). Rates have dropped as a result of the availability, for almost 40 years, of a preventive vaccine (Centers for Disease Control and Prevention, 2020).

The human immunodeficiency virus (HIV), which causes acquired immune deficiency syndrome (AIDS), is transmitted through bodily fluids, usually by sharing intravenous drug needles or by sexual contact with an infected partner. The virus attacks the body's immune system, leaving a person vulnerable to a variety of fatal diseases. Symptoms of AIDS include extreme fatigue, fever, swollen lymph nodes, weight loss, diarrhea, and night sweats.

Globally, estimates are there are 37.7 million people living with HIV/AIDS. There were 1.5 million new HIV infections worldwide in 2020 (UNAIDS, 2021), approximately a third of which were in adolescents (UNAIDS, 2021). As of now, AIDS is incurable, but increasingly, the related infections that kill people are being stopped with antiviral therapy.

In the United States, approximately 1.2 million people are living with HIV. The incidence rate has dropped by more than two-thirds from the height of the epidemic in the mid-1980s; however, progress has plateaued in recent years and remained at about 37,000 new infections per year. Risk varies across different groups, with gay and bisexual

Greek and Roman gods live on in our language. STIs used to be called "venereal diseases," a term referencing Venus, the Roman goddess of love. Similarly, the term "aphrodisiac" harkens to Aphrodite, the Greek counterpart to Venus.



men at the highest risk. People who inject drugs, African Americans and Hispanics, and people living in the southern United States are also at higher risk. Young adults, too, are at increased risk, and account for about 21 percent of new infections. About 13 percent of people infected with the virus are unaware of their status. About half of infected people who are receiving treatment have a suppressed viral load, a sign of successful management of the disease. Still, many remain untreated, and in 2019, almost 16,000 people with HIV died (Centers for Disease Control and Prevention, 2021).

**Bacterial STIs** The most common bacterial STIs are chlamydia and gonorrhea (see Figure 2). Globally, approximately 3.8 percent of women and 2.7 percent of men have a diagnosis of chlamydia (Rowley et al., 2019). In the United States in 2019, 1.8 million cases of chlamydia were reported, with the highest proportion of infections (61 percent) found in young adults aged 15 to 24 years. Although rates are higher in women, women are also more likely to be screened for the disease (Centers for Disease Control and Prevention, 2021). Syphilis is less common, with approximately 134,000 cases diagnosed in 2020 and the highest rates found in men who have sex with other men (Centers for Disease Control and Prevention, 2022).

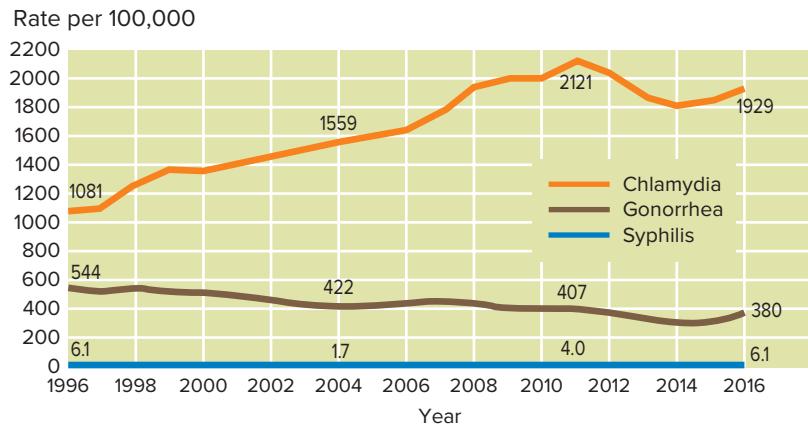
Many people with chlamydia have no symptoms, although they can still transmit the infection to others. Some infected people develop abnormal vaginal or penile discharge and a burning sensation during urination. These diseases, if undetected and untreated, can lead to severe health problems, including, in women, pelvic inflammatory disease (PID), a serious abdominal infection. (Centers for Disease Control and Prevention, 2014).

Gonorrhea is most commonly contracted via vaginal, anal, or oral sex. As with chlamydia, symptoms may include abnormal discharge from the penis or vagina, painful urination, and rectal discharge, itching, and soreness. Untreated gonorrhea can lead to PID as well as infections in the eyes, throat, or joints (Centers for Disease Control and Prevention, 2014). Globally, estimates are that 0.9 percent of women and 0.7 percent of men are infected with gonorrhea ((Rowley et al., 2019), with an approximate 82 million additional people infected each year (World Health Organization, 2021). In the United States, approximately half of the 1.6 million yearly new gonorrhea infections occur in people aged 15 to 24 years (Centers for Disease Control and Prevention, 2021).

Syphilis spreads via direct contact with a chancre, or sore, usually through vaginal, anal, or oral sex. Pregnant women can also transmit the infection to their fetus. The progression of the disease

follows a series of stages. In the primary stage, chancres develop at the location the syphilis infected the person. In the secondary stage, rashes and membrane lesions (sores in the mouth, vagina, or anus) emerge, often in multiple areas of the body. There may also be fever, sore throat, muscle aches, and fatigue. Following this, there is a latent stage, potentially for years. Last, if individuals are not treated, tertiary syphilis may develop as much as 30 years after infection. During this time, syphilis can affect the multiple systems and may cause headaches, muscle weakness or paralysis, mental confusion, vision problems, hearing issues, and more (Centers for Disease Control and Prevention, 2022).

Currently treatable with antibiotics, gonorrhea and to a lesser extent chlamydia and syphilis are showing growing signs of antibiotic resistance. Currently, a single high-dose antibiotic injection is the recommended treatment for gonorrhea (Cyr et al., 2020); however, if new drugs are not developed, gonorrhea may no longer be a treatable disease (Centers for Disease Control and Prevention, 2021).



**FIGURE 2**  
Chlamydia, Gonorrhea, and Syphilis Rates for Adolescents Aged 15 to 19

Source: Centers for Disease Control and Prevention (2017).

### checkpoint can you... ?

- Identify and describe the most common sexually transmitted infections?
- List risk factors for developing an STI during adolescence, and identify effective prevention methods?

## TEEN PREGNANCY

Approximately 12 million young women aged 15 to 19 years give birth each year in developing countries, and 10 million of these pregnancies are unintentional. Young women often do not have access to contraceptives or reproductive health care. In some cultures, particularly in developing countries, girls marry at a young age and are encouraged to bear children early. Moreover, sexual violence is widespread, and up to a third of girls in some countries report being raped as their first sexual encounter. The consequences of these pregnancies can be immense. Approximately 5.6 million of these young girls obtain abortions every year, 3.9 million of which are unsafe. Childbirth also can be unsafe in developing areas of the world. Pregnancy and childbirth complications are the leading cause of death for 15- to 19-year-old women (World Health Organization, 2020).

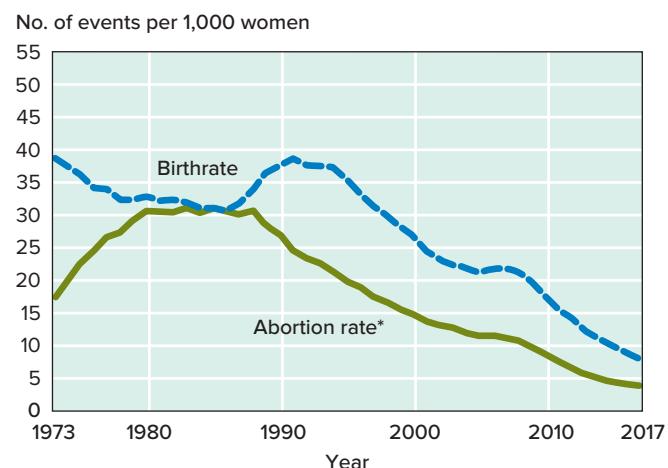
Pregnancy rates vary widely across countries for which data are available. In Europe, teen pregnancy and birthrates are many times lower than in the United States despite similar levels of sexual activity (Guttmacher Institute, 2013). For example, the US rate of teenage birth and pregnancy is 6 times higher than that of Switzerland and more than twice as high as France (Lindberg et al., 2016). In addition to the United States, other areas with high pregnancy rates include Mexico, sub-Saharan Africa, Azerbaijan, Georgia, and Romania. The lowest pregnancy rates are found in Switzerland, the Netherlands, Singapore, and Slovenia. Abortion rates also vary, with a low of 17 percent of teen pregnancies ending in abortion in Slovakia to a high of 69 percent in Sweden (Sedgh et al., 2015).

Birthrates for US teenagers peaked in 1957 at 96.3 births per 1,000 women and have fallen dramatically since then to 15.3 births per 1,000 women in 2020 (Ventura et al., 2014; Hamilton et al., 2021; see Figure 3). More than half (60 percent) of 15- to 19-year-old pregnant girls in the United States have their babies. Of the remainder of these pregnancies, 29 percent end in abortion, and 15 percent end in miscarriage or stillbirth. Seventy-two percent of teens who carry the pregnancies to term are between the ages of 18 and 19 years (Kost et al., 2017).

The decline in teen pregnancy rates reflects a variety of factors, including, most importantly, increased use of contraception (Lindberg et al., 2016). The declines also have accompanied steady decreases in early intercourse and in sex with multiple partners. Declines in teenage pregnancy and childbearing have occurred among all population groups. Still, non-Hispanic Black and Hispanic girls are more likely to have babies than non-Hispanic White or Asian American girls (Hamilton et al., 2021). Abortion rates have also declined, although there is no clear pattern linking reduced access to abortion services to the abortion rate. Rather, the decline appears to be a consequence of overall declines in pregnancies themselves (Nash & Dreweke, 2019).

Seventy-five percent of pregnant teenagers describe their pregnancies as unintended, and 50 percent of teen pregnancies occur within 6 months of sexual initiation (Kost et al., 2017; Klein & AAP Committee on Adolescence, 2005). Research suggests that contributing factors for teen pregnancy are similar for both young men and women. They include low education and socioeconomic status, being in foster care, having a teen parent, having been physically or sexually abused and/or exposed to parental divorce or separation, domestic violence, substance abuse, or having a household member who was mentally ill or engaged in criminal behavior (Centers for Disease Control and Prevention, 2019; Madigan et al., 2014; Fasula et al., 2019).

**Outcomes of Teenage Pregnancy** Teenage pregnancies often have poor outcomes. Many of the mothers are impoverished and poorly educated, and some have substance abuse issues. During pregnancy, many do not eat properly, do not gain enough weight, and get inadequate prenatal care or none at all.



**FIGURE 3**  
Birth and Abortion Rates for US  
Teenagers Ages 15 to 17

Source: Maddow-Zimet & Kost (2021), Figure 3.



*MTV's Teen Mom franchise, originally criticized for glamorizing teen pregnancy, may instead be partially responsible for the recent declines in teenage motherhood (Kearney & Levine, 2014).*

DFree/Shutterstock

In addition, teenage mothers are likely to drop out of school and to have repeated pregnancies, and they are less likely to go to college. Their babies are likely to be premature or dangerously small and are at heightened risk of other birth complications. These children are also at heightened risk for health and academic problems, abuse and neglect, and developmental disabilities, substance abuse, gang activity, and of becoming adolescent parents themselves (Basch, 2011; Jeha et al., 2015; Wen et al., 2007).

Poor outcomes of teenage parenting are far from inevitable, however. Several long-term studies find that, two decades after giving birth, most former adolescent mothers are not on welfare; many have finished high school and secured steady jobs; and they do not have large families. Comprehensive adolescent pregnancy and home visitation programs seem to contribute to good outcomes (Basch, 2011; Klein & AAP Committee on Adolescence, 2005), as does contact with the father (Howard et al., 2006) and involvement in a religious community (Carothers et al., 2005).

**Sex Education and Pregnancy Prevention** Approximately 22 percent of teen girls and 30 percent of teen boys report that their parents do not talk to them about any sexual or reproductive health topics (Lindberg et al., 2016). Many teenagers get much of their sex education from the media, which present a distorted view of sexual activity, associating it with fun, excitement, competition, or violence and rarely showing the risks of unprotected sex. Increasingly, teens are using online sources to access confidential information, although television and streamed content also plays a role (Guilamo-Ramos et al., 2015). Teens who watch highly sexual television content are twice as likely to experience a pregnancy compared to those with lower level or no exposure (Chandra et al., 2008). Additionally, teens exposed to sexually explicit content—including pornography and erotica—are more likely to have oral sex and sexual intercourse at earlier ages (Brown & L'Engle, 2009). Moreover, those teens exposed to sexual explicit content or sexual violence in media are more likely to be perpetrators or victims of sexual violence themselves (Rodenhizer & Edwards, 2019).

Teens may also learn about sexual and reproductive health through formal educational programs. Teen sexual education programs generally either promote abstinence or are comprehensive (Research in Action). Abstinence-only programs, sometimes known as sexual risk avoidance programs, present sex within the context of marriage as the only morally acceptable and safe form of sexual activity. By contrast, comprehensive sexual education programs encourage abstinence but also discuss STI infections and safer sexual practices. Approximately 90 percent of teens receive some formal sexual education—generally at a school, church, or community center—on preventing STIs or how to say no to sex. However, only about half of teens receive any information on the use of birth control methods (Lindberg & Kantor, 2021).

Some critics argue that comprehensive sex education leads to more or earlier sexual activity, even though evidence shows otherwise. Comprehensive sexual education programs have been found to delay sexual initiation, promote positive behavioral change, and increase contraceptive use across both high- and lower-income countries (Goldfarb & Lieberman, 2021). By contrast, most abstinence-only programs have not been found to delay sexual activity, reduce the incidence of sexual risk taking, or increase safer sex practices such as the use of condoms (Santelli et al., 2017). Likewise, pledges to maintain virginity have shown little impact on sexual behavior other than a decrease in the likelihood of taking precautions during sex (Rosenbaum, 2009).

Prior to 2016, Congress had shifted financial support away from abstinence-only programs and directed funds toward evidence-based models. Thus, comprehensive sexual education programs were funded, and teen pregnancy rates hit historic lows (Boyer, 2018). However, under the Trump administration, federal funding for abstinence edu-

Teen pregnancy rates are higher in states funding abstinence-only sexual education than in states funding comprehensive sexual education programs (Fox et al., 2019).



## LGBTQ+ INCLUSIVITY IN SEX EDUCATION

How do we learn about sex? Sex education begins early in childhood and continues through our entire lifespan, but we tend to truly start understanding what sex is during adolescence. One way of learning about sex in the United States is through formal sex education in school, which varies by state law. In their *2019/2020 State Profiles* update, the Sexuality Information and Education Council (SEICUS, 2021) reported that 29 states and the District of Columbia required some form of sex education. However, most sex education courses omit information about the LGBTQ+ community.

In much of the United States, abstinence programs, in which the only acceptable standard of sexual behavior is in the context of a heterosexual marriage, are the norm. Such programs have been repeatedly shown to be ineffective in reducing unwanted pregnancies or sexually transmitted diseases (Santelli et al., 2017). Moreover, they may be actively damaging to sexual-minority youth. Research conducted with LGBTQ+ students has shown that there is very little instruction on nonheterosexual identities and almost no instruction on transgender persons and nonbinary gender identities (Rabbitte, 2020). This heteronormative orientation is also reflected in state policy; SEICUS reports that only seven states have policies directly related to LGBTQ+ inclusion on health and identity. Moreover, nine states specifically require instruction that discriminates against LGBTQ+ persons (SEICUS, 2021).

A lack of LGBTQ+ representation in the sex education classroom can make students feel invisible and silenced, especially when teachers refuse to answer questions or express they are prohibited from discussing topics related to gender and sexuality. There are consequences to this approach: Noninclusive sexual education has been associated with an increase in anxiety, depression, and suicidality in sexual-minority youth (Keiser et al., 2019). Moreover, such

programs either exert effects on or reflect overall school climate. High school students in states with a lower proportion of inclusive sex education programs are more likely to experience school-based victimization and bullying (Proulx et al., 2019).

LGBTQ+ students want an inclusive curriculum that doesn't pathologize same-sex behavior as dangerous or immoral. Inclusive curricula would provide resources and useful information regarding anatomy, sex, and relationships that relates to all persons instead of solely focusing on heterosexual and cisgender students. When formal sex education is lacking, LGBTQ+ adolescents tend to turn to family, friends, partners, the internet, and other media sources to learn about sex. While these resources can be of great value, information found on the internet and in other media sources, such as pornography, can be inaccurate and provide unrealistic depictions of sex. Additionally, LGBTQ+ and questioning youth may not feel comfortable turning to friends and family, especially if they perceive them to display prejudice.

Where do we go from here? Research on LGBTQ+ students' perceptions of their sex education and ideal sex education is growing. Psychologists conduct research with LGBTQ+ youth through quantitative and qualitative methods, most notably using surveys and interviews. This research can then be used to influence policy pertaining to inclusive sex education practices at the state and federal levels. While progress may take time, the sex education curriculum is changing.



What should a school district do if parents in that district oppose an inclusive sex education curriculum? What types of concerns do LGBTQ+ teens have that might be different than those of heterosexual and cisgender teens?

tion programming rose sharply, and comprehensive sexual education programs previously demonstrated to be effective were defunded (Donovan, 2017). Although the federal government currently funds the Teen Pregnancy Prevention Program (emphasizing the reduction of unintended pregnancies) and the Personal Responsibility Education Program (emphasizing abstinence and contraception), there are currently no federal programs dedicated to funding evidence-based comprehensive sexual education programs in the United States (Guttmacher Institute, 2021).

Teens in European countries have a lower pregnancy rate despite similar rates of sexual activity. This has been attributed to the provision of universal, comprehensive sex education for young adults and access to reproductive services. Contraceptives are provided free to adolescents in many countries. Comprehensive sexual education programs have also been shown to be effective in preventing pregnancy and disease across sub-Saharan Africa, Asia, Latin America, and the Caribbean (Fonner et al., 2014). Unfortunately, policies promoting abstinence programs have not only undermined the quality of the information taught in the United States but also in foreign aid programs. These policies have harmed both family planning and HIV prevention programs in other countries (Santelli et al., 2017).

## OTHER RISKS OF ADOLESCENCE

Although sexually transmitted infections are a significant risk, adolescence carries with it other concerns as well. In some countries, teen girls are at particular risk for female genital mutilation or early marriage.

**Female Genital Mutilation and Child Marriage** Female genital mutilation (FGM) includes any and all procedures that involve removal of external female genitalia for non-health-related reasons. Often it involves the removal of the clitoris or the inner and/or outer folds of the vulva, or narrowing of the vaginal opening with stitches. More than 200 million women and girls have been cut, primarily in Africa, the Middle East, and Asia. Although the stated reasons for its use vary, they often center upon maintaining chastity (by removing the temptation of sexual pleasure) and improving marriageability.

There are no health benefits to FGM and many complications. Immediate complications include bleeding, infections, and slow healing. However, the repercussions of this practice can be lifelong. They include damage to adjacent organs, infertility, recurrent urinary tract infections, birth complications, dermoid cysts, and death. Although strides have been made in combating this practice, approximately 3 million girls a year remain at risk of receiving the procedure (World Health Organization, 2022).

Child marriage is a human rights violation and is almost universally banned. Nonetheless, it is shockingly common, especially in lower- and middle-income countries. Global estimates are that over 650 million women alive today married before turning 18 years of age, and approximately 12 million girls a year are forced into early marriage. The highest rates of child marriage are in West and Central Africa and South Asia.

Child marriage is a significant risk factor for girls. Most notably, child brides are more likely to become pregnant as teens. Complications as a result of pregnancy are the leading global cause of death for adolescent girls. Additionally, child brides are at higher risk for STIs and abuse and are less likely to continue or complete their education. Although boys are sometimes married against their will, this is relatively rare.

Movements to end child marriage have focused most strongly on increasing girls' and women's access to education and health care services as well as educating community members about the risks and consequences of child marriage. These efforts have resulted in slow but steady declines in the practice. In 2000, 1 in 3 young adult women reported being married as children. In 2017, this number had fallen to 1 in 5 (United Nations Population Fund, 2022).

### checkpoint can you . . .

- Summarize trends in teenage pregnancy and birthrates?
- Discuss risk factors, problems, and outcomes connected with teenage pregnancy?
- Describe two other risks of adolescence?

## Relationships with Family, Peers, and Adult Society

Age becomes a powerful bonding agent in adolescence. Adolescents spend more time with peers and less with family. Even as adolescents increasingly turn toward peers to fulfill many of their social needs, they still look to parents for a secure base from which they can stretch their wings.

## THE MYTH OF ADOLESCENT REBELLION

The teenage years have been called a time of **adolescent rebellion**, involving emotional turmoil, conflict within the family, alienation from adult society, reckless behavior, and rejection of adult values. But is this characterization of teens true?

Teenage rebellion, rather than being normative, is more likely to be associated with variables such as abusive, indifferent, or neglectful parenting (McDermott & Barik, 2014). The relatively few deeply troubled adolescents tend to come from disrupted families and, as adults, continue to have unstable family lives and to reject cultural norms (Holmbeck, 2018).



## ADOLESCENTS AND PARENTS

Just as adolescents feel tension between dependency on their parents and the need to break away, parents want their children to be independent yet find it hard to let go.

**Individuation and Family Conflict** If you were like most teens, you probably listened to different music from your parents, dressed in a different style of clothing, and felt it was reasonable to keep certain things private from them. This process, called **individuation** by psychologists, begins in infancy and continues throughout adolescence. It involves the struggle for autonomy and differentiation, or personal identity. An important aspect of individuation is carving out boundaries of control between self and parents (Nucci et al., 2005), a process which may entail family conflict.

Although family conflict and emotional distance do increase somewhat during adolescence, particularly in mother-daughter dyads (Holmbeck, 2018), most young people feel close to and positive about their parents, share similar opinions on major issues, and value their parents' approval (Blum & Rinehart, 2000; Offer & Church, 1991). Most family arguments concern control over everyday personal matters—chores, schoolwork, dress, money, curfews, dating, and friends—rather than issues of health and safety or right and wrong (Adams & Laursen, 2001; Steinberg, 2005).

Parents of young adolescents must strike a delicate balance between too much freedom and too much intrusiveness. For instance, seventh and eighth graders are at elevated risk for problem behaviors because of decreased parental monitoring and involvement, which allow the behavior of antisocial peers to exert an increased influence (Van Ryzin et al., 2012). By eleventh grade, those young people who see themselves as having a great deal of autonomy tend to spend more time in unsupervised socializing with peers, again increasing risk. But too little autonomy can also have negative effects. Those students who perceive their parents as highly intrusive in their personal lives are also more likely to be influenced by negative peer interactions (Goldstein et al., 2005).

Overall, family conflict predicts multiple adjustment problems, including depression, anxiety, conduct problems, and problems with peers (Cummings et al., 2015), and it tends to increase over time in harsh, coercive, or hostile families (Rueter & Conger, 1995). Additionally, adolescent maltreatment has been linked to criminal offenses and violent crime, alcohol and drug use, risky sexual behavior, and suicidal thoughts (Thornberry et al., 2010).

Alternatively, healthy family interactions have a positive effect. Family conflict tends to go down over time in warm, supportive families (Rueter & Conger, 1995). In addition, autonomy support on the part of parents is associated with more adaptive self-regulation

*Contrary to popular belief, most adolescents are not ticking time bombs. Those raised in homes with a positive family atmosphere tend to come through adolescence with no serious problems.*

Hero Images/Getty Images

### checkpoint can you . . .

- ▶ Assess the extent of storm and stress during the teenage years?

#### adolescent rebellion

Pattern of emotional turmoil, characteristic of a minority of adolescents, that may involve conflict with family, alienation from adult society, reckless behavior, and rejection of adult values.

#### individuation

Adolescents' struggle for autonomy and personal identity.

Although correlational, a small but intriguing study showed teens and parents whose brains were more "neurally synchronized" (as measured by resting state similarities in their brain scans) were also more emotionally synchronized (as measured by daily diary self-reports) over a 2-week time period (Lee et al., 2017).

In many indigenous cultures, family conflict is believed to cause health problems (Lancy, 2014).

of negative emotions and academic engagement (Roth et al., 2009), and positive family identification is related to less depression (Gutman & Eccles, 2007). Adolescents who are given more decision making opportunities report higher self-esteem than those who are given fewer such opportunities (Gutman & Eccles, 2007). Somewhat paradoxically, a warm, interconnected relationship with parents can help teens individuate successfully (Ponappa et al., 2014). Last, both individuation and family connectedness during adolescence predict well-being in middle age (Bell & Bell, 2005).

There are also cultural differences. One primary distinction is that drawn between collectivistic and individualistic societies. Research in this area shows that connectedness between teens and parents is higher in collectivistic countries such as India, Saudi Arabia, and Algeria than in individualistic Western countries such as France, Poland, and Argentina (Dwairy & Achoui, 2010). In collectivistic cultures, the developmental goal during adolescence is less about establishing independence away from the family and more about establishing interdependence and strengthening emotional bonds with the family members (Bornstein & Putnick, 2018).

Cultural differences can also be found within the borders of the United States. For example, African American teenagers, who may look on their families as havens in a hostile world, tend to maintain more intimate family relationships and less intense peer relations than White teenagers (Giordano et al., 1993). Adolescents from Mexican and Chinese families, particularly immigrant families, report a stronger sense of family obligation and assistance and spend more time on activities that carry out those obligations (Hardway & Fuligni, 2006). Asian, Latino, and European American teens all tend to show higher levels of happiness when they participate in activities that help the family (Telzer & Fuligni, 2009), suggesting their individuation processes function effectively within their cultural framework. There are multiple cultural pathways to successful adult relationships with parents.

**Parenting Styles and Parental Authority** Authoritative parenting continues to foster healthy psychosocial development in adolescents (Hoskins, 2014). Authoritative parents insist on important rules, norms, and values but are willing to listen, explain, and negotiate. They exercise appropriate control over a child's conduct (behavioral control) but not over the child's feelings, beliefs, and sense of self (psychological control) (Steinberg & Darling, 1994). So, for example, they might ground their teenage son for breaking a rule, but they would not insist that the teen agree with them about the wisdom of the broken rule.

Overall, teens whose parents firmly enforce behavioral rules have more self-discipline and fewer behavior problems than those with more permissive parents, and those whose parents grant them psychological autonomy tend to be self-confident and competent academically and socially (Gray & Steinberg, 1999). By contrast, psychological control can harm adolescents' psychosocial development and mental health and is associated with externalizing problems (Pinquart, 2017). For example, withdrawal of love as a control strategy is associated with an increase in resentment toward parents and a decrease in teens' ability to self-regulate negative emotions (Roth et al., 2009).

The literature on parenting styles has been critiqued on the grounds it is primarily unidirectional. In other words, the original model considered the effect of parenting on adolescents but minimized the effect that teens' behaviors had on parenting. For example, a rebellious and confrontational adolescent is likely to elicit a far different set of parenting behaviors than will a compliant and cooperative teen. There is evidence that this is indeed the case. For example, meta-analyses indicate that many effects of parenting on teen behavior are bidirectional (Pinquart, 2017). Additionally, some research suggests that adolescents may actually exert a stronger effect on their parents' behavior than parenting exerts on their behavior (Kerr et al., 2012), perhaps via their own genetically influenced personality traits (Klahr & Burt, 2014).

**Parental Monitoring and Adolescents' Self-Disclosure** A large body of research shows that parental monitoring is one of the most consistently identified protective factors for teens (Racz & McMahon, 2011; Flanagan et al., 2019). Parental monitoring broadly

involves keeping track of the young person's activities, for example, by signing the teen up for after-school activities, checking in with parents of their teen's friends, and keeping track of a teen's whereabouts.

Young people's growing autonomy and the shrinking areas of perceived parental authority redefine the types of behavior adolescents are expected to disclose to parents (Smetana et al., 2005). Both adolescents and parents see prudential issues, behavior related to health and safety (such as smoking, drinking, and drug use), as most subject to disclosure, followed by moral issues (such as lying), conventional issues (such as bad manners or swearing), and multifaceted, or borderline, issues (such as seeing an R-rated movie), which lie at the boundary between personal matters and one of the other categories. Both adolescents and parents see personal issues (such as how teens spend their time and money) as least subject to disclosure. However, for each type of behavior, parents tend to want more disclosure than adolescents are willing to provide, although this discrepancy diminishes with age (Smetana et al., 2006). Importantly, adolescent disclosure to parents is predictive of delinquency; those teens who disclose more are less likely to engage in problem behaviors (Keijsers et al., 2010).

Teens are more likely to disclose information when parents maintain a warm, responsive family climate and provide clear expectations without being overly controlling. This link between warmth and disclosure has been found in various ethnic groups in the United States, including Chinese, Mexican American, European American, and Korean youth (Yau et al., 2009; Yun et al., 2016). Adolescents, especially girls, tend to have closer, more supportive relationships with their mothers than with their fathers (Smetana et al., 2006), and girls confide more in their mothers (Yau et al., 2009). Moreover, relationship quality seems to matter more in girls' willingness to confide in their parents. In other words, boys' secret keeping depends less on relationship warmth than does that of girls' (Keijsers et al., 2010).

**Family Structure and Atmosphere** The family structure in the home can affect adolescent development. For instance, adolescents living with their continuously married parents tend to have significantly fewer behavioral problems than those in other family structures (single-parent, cohabiting, or stepfamilies) (Amato, 2010). However, research suggests the structure of the family is less important than the family climate. This is because the processes that promote or undermine positive development are the same across varied types of families (Murry & Lippold, 2018). For example, when negative affect or conflict are high, teen outcomes are less positive regardless of the family structure (Phillips, 2012; Lansford et al., 2001). Moreover, marriage is not always best. At times, ending a high-conflict marriage can lead to improvements in child outcomes (Amato, 2010).

Transitions, too, matter. Transitioning into a new family structure, as occurs when parents divorce or remarry, can have a negative influence on outcomes. This is particularly true when there is an associated change in economic status or if the transition negatively affects parenting practices (Murry & Lippold, 2018). Moreover, the greater the number of family structural transitions experienced, the greater the risk of negative outcomes (Amato, 2010).

Divorce can impact outcomes via its influence on parenting quality. For example, when parents are distressed or engaged in high levels of conflict with their spouse, adolescents are more likely to show emotional or behavioral problems. And when divorcing parents are disengaged and parenting is lax, teens are likely to show increased externalizing behavior (Stallman & Ohan, 2016). There is evidence this link is mediated by alterations in the parenting relationship (van Dijk et al., 2020). In other words, it is not seeing or experiencing conflict itself that negatively impacts teens but rather the negative effect that conflict has on the quality of postdivorce parenting.

Divorce can also harm adolescents' relationship with their father. When parents are married, teens report a close relationship with their father 48 percent of the time. However, teens whose parents divorce report being close to their father only 25 percent of the time (Scott et al., 2007). Importantly, it is not always the case that more contact is good. Although involvement with nonresident fathers is generally beneficial, high levels

of conflict between father and teen are associated with externalizing problems and low academic achievement in teens (Modecki et al., 2015). High-quality involvement by a nonresident father helps a great deal, but not as much as the involvement of a father living in the home (Carlson, 2006).

Adolescents in cohabiting families, like younger children, tend to have greater behavioral and emotional problems than adolescents in married families when compared to teens from continuously married families (Brown, 2004). However, a better comparison group may be that of adolescents in stepparent families. Some of the data on cohabitation are driven by family instability—a documented negative influence on development—rather than cohabitation per se. Adolescents in stepparent families have also experienced family instability and thus may be considered a more appropriate comparison group. When compared to teens in married stepparent families, a recent review suggested that adolescents in cohabitating families are similar in outcomes. They have similar rates of delinquency, substance abuse, risky sexual activity, academic outcomes, physical health, and emotional well-being (Manning, 2017). Thus, it is not whether or not a family is married that drives outcomes, but rather the degree of instability in the family, married or not.

Adolescents from families headed by gay or lesbian parents do not appear to show differences in a wide variety of outcomes, including cognitive development, gender identity, and adjustment problems (Fedewa et al., 2015). Rather, as with traditional two-parent families, the quality of the relationship—not the sexual orientation of the parents—is the key variable influencing outcomes (Wainright & Patterson, 2006).

**Mothers' Employment and Economic Stress** The impact of a mother's work outside the home may depend on how many parents are present in the household. Single mothers may find that work affects how much time and energy is left to spend with children or monitor their activities. For example, in one study, mothers who worked at night spent less time with their teen children, had lower-quality home environments, and were less close to their children. These variables, in turn, were related to an increase in risky adolescent behaviors (Han et al., 2010). Additionally, maternal employment has repeatedly been associated with a less healthy nutritional environment in the home (Bauer et al., 2012) and an increased risk of overweight (Morrissey, 2013).

The type of after-school care and supervision is important. Those teens who are on their own, away from home, tend to become involved in alcohol and drug use and in misconduct in school, especially if they have an early history of problem behavior (Coley et al., 2004). Participation in organized after-school activities can serve as a protective factor (Mahatmya & Lohman, 2011; Sharp et al., 2015).

Teens are more likely to drop out of school and show declines in self-esteem and mastery if their mothers have unstable employment or are out of work for 2 years (Kalil & Ziol-Guest, 2005). Job displacement—where employees lose their jobs due to organizational changes such as restructuring, downsizing, or relocating—has also been associated with declines in educational attainment and well-being in adolescents from single-parent families (Brand & Thomas, 2014). Family economic hardship during adolescence affects adult well-being in part because it is stressful, and that stress interferes with family relationships and affects children's educational and occupational attainments (Sobolewski & Amato, 2005).

Many of these stressors have been exacerbated by COVID-19. The employment disruptions caused by the pandemic affected women's employment to a greater degree than men's. Moreover, most schools were shut down during all or part of the academic year, and many children and teens switched to remote schooling options, further increasing the strain on single parents (Alon et al., 2021). Not surprisingly, single mothers reported elevated stress, anxiety, and depression during the pandemic, citing socioeconomic pressure and remote schooling as key variables (Taylor et al., 2021). Moreover, increases in parental stress, anxiety, and depression were in turn associated with increases in externalizing and internalizing behaviors in children and teens. These negative outcomes were most striking for children with existing mental health problems, disadvantaged families, and single-parent families (Whittle et al., 2020).

## checkpoint can you...

- Identify factors that affect conflict with parents and adolescents' self-disclosure?
- Discuss the impact on adolescents of parenting styles and of marital status, mothers' employment, and economic stress?

## SIBLING RELATIONSHIPS

In many traditional cultures, older siblings are responsible for caring for younger siblings (Weisner et al., 1977). This care may involve merely keeping a younger sibling occupied while a nearby parent is busy to full responsibility for feeding, bathing, and caring for a younger sibling (Maynard, 2004). In Western, industrialized countries such as the United States, siblings are generally not given these types of responsibilities.

Changes in sibling relationships in many ways mirror the changes we see in the relationships of adolescents and their parents. As adolescents spend more time with peers, they spend less time with siblings. Generally, and perhaps as a result of this, adolescents tend to be less close to siblings than to friends and are less influenced by them. This distance grows across adolescence (Laursen, 1996). Moreover, as children move through adolescence, their relationships with their siblings become progressively more equal (Campione-Barr, 2017), and sibling conflict generally declines (Jensen et al., 2019).

Siblings are important in part because social skills learned within the context of sibling relationships can be transferred to the peer group. For example, adolescents who have positive relationships with their siblings are liked better by their peers (Yucel et al., 2018). Moreover, those teens with high-quality peer relationships show more empathy for others, and are more likely to show concern for and understanding of others' emotions (Boeke et al., 2019). This link also exists for romantic relationships. Teens who have opposite-sex siblings report increases in their perceived romantic competence from early adolescence into adulthood (Doughty et al., 2015).

Sibling relationships also interact with parent-child relations and the parents' marital relationship. Indeed, a high-quality sibling relationship can buffer a teen against the negative consequences of parental conflict (Davies et al., 2018). For example, in one study, parent-child conflict was associated with sibling conflict. However, siblings became closer when fathers became less happy in their marriage and more intimate when their mothers were warm and accepting (Kim et al., 2006). Additionally, research has shown that differential treatment, in which teens perceive a parent as favoring their sibling, is associated with both externalizing and internalizing behavior problems (Buist et al., 2013).

A recent meta-analysis supports the strong connection between warm relationships with little conflict and healthier psychological adjustment in siblings (Buist et al., 2013). When siblings show increases in warmth and decreases in conflict over time, this predicts a decrease in depressive symptoms (Harper et al., 2016). However, although generally a warm relationship is protective and contributes to good outcomes, at times an emotionally close sibling relationship can lead to an increased risk of a child modeling the antisocial behavior of a delinquent sibling (Dirks et al., 2015). Older siblings may influence a younger one to smoke, drink, or use drugs (Pomery et al., 2005; Rende et al., 2005). For instance, younger siblings hanging out with an antisocial older brother are at serious risk for adolescent antisocial behavior, drug use, sexual behavior, and violence (Solvay et al., 2014).

*If you have one or more brothers or sisters, did your relationships with them change during adolescence?*



*Sibling relationships become more equal as younger siblings approach or reach adolescence and the relative age difference diminishes. Even so, younger siblings still look up to their older siblings and may try to emulate them.*

Kristy-Anne Glubish/Design Pics/Getty Images

### checkpoint can you...

- Identify typical changes in sibling relationships during adolescence and factors that affect these relationships?

## PEER RELATIONSHIPS

An important influence in adolescence is the peer group. The peer group is a source of affection, sympathy, understanding, and moral guidance. It is a place to form intimate relationships that serve as rehearsals for adult intimacy.

As an adolescent, were you part of a clique or crowd? If so, how did it affect your social relationships and attitudes?



In childhood, most peer interactions are dyadic, or one-to-one, though larger groupings begin to form in middle childhood. As children move into adolescence, the peer social system becomes more diverse. Cliques—structured groups of friends who do things together—become more important. A larger type of grouping, the crowd, which does not normally exist before adolescence, is based not on personal interactions but on reputation, image, or identity. Crowd membership is a social construction: for example, the jocks, the nerds, or the stoners. All three levels of peer groupings may exist simultaneously, and some may overlap in membership, which may change over time. Both clique and crowd affiliations tend to become looser as adolescence progresses (Brown & Klute, 2003).

The influence of peers normally peaks at ages 12 to 13 and declines during middle and late adolescence. Risk-taking, especially in early adolescence, is higher in the company of peers than when alone (Gardner & Steinberg, 2005), even when potential negative consequences are made clear (Smith et al., 2014). For example, at age 13 or 14, popular adolescents may engage in mildly antisocial behaviors, such as trying drugs or sneaking into a movie without paying, to demonstrate to their peers their independence from parental rules (Allen et al., 2005). However, attachment to peers in early adolescence is not likely to forecast real trouble unless the attachment is so strong that the young person is willing to give up obeying household rules, doing schoolwork, and developing their own talents in order to win peer approval and popularity (Fuligni et al., 2001).



*The increased intimacy of adolescent friendship reflects cognitive as well as emotional development. Closer intimacy means a greater ability and desire to share emotions and feelings.*

Image Source

Peers can influence spending decisions as well. Although retailers may not relish the sight of a group of teens descending upon their store, research shows teens in groups are likely to spend more than those shopping alone (Mangleburg et al., 2004).



**Friendships** The intensity and importance of friendships and the amount of time spent with friends are probably greater in adolescence than at any other time in the life span. Friendships tend to become more reciprocal, more equal, and more stable, although many friendships, especially low-quality ones, are still fleeting (Hiatt et al., 2015). Those that are less satisfying become less important or are abandoned. Often, differences in such areas as peer acceptance, physical aggression, school competence, and especially sex predict friendship dissolution (Hartl et al., 2016).

Greater intimacy, loyalty, and sharing with friends mark a transition toward adultlike friendships. Adolescents begin to rely more on friends than on parents for intimacy and support, and they share confidences more than younger friends do (Hartup & Stevens, 1999; Nickerson & Nagle, 2005). Girls' friendships tend to be more intimate than boys', with frequent sharing of confidences (Brown & Klute, 2003). Intimacy with same-sex friends increases during early to midadolescence,

after which it typically declines as intimacy with the other sex grows (Laursen, 1996).

The capacity for intimacy is related to psychological adjustment and social competence. Adolescents with high-quality friendships have a high opinion of themselves, do well in school, are sociable, and are less likely to be hostile, anxious, or depressed (Berndt & Perry, 1990; Hartup & Stevens, 1999; Hiatt et al., 2015). Overall, adolescents who are more intimate with their friends feel closer to and have less conflict with them (Chow et al., 2013). There are longer-term consequences as well. Children who are rejected by their peers in middle school are more likely to experience lower-quality romantic relationships in high school (Schacter et al., 2019), and the quality of friendships in adolescence is associated with romantic life satisfaction in young adulthood (Allen et al., 2020).

These interactions may be part of a more general process. When adolescents have high-quality friendships, those friendships tend to be deeply embedded within their other supportive social relationships, including other friends, romantic partners, and family

## CULTURE AND DISCRETIONARY TIME

One way to measure changes in adolescents' relationships with the important people in their lives is to see how they spend their discretionary time. Cultural variations in time use reflect varying cultural needs, values, and practices.

Young people in tribal or peasant societies spend most of their time producing necessities of life and have less time for socializing than adolescents in technologically advanced societies (Larson & Verma, 1999). In some postindustrial societies such as Korea and Japan, where the pressures of schoolwork and family obligations are strong, adolescents have relatively little free time. To relieve stress, they spend their time in passive pursuits, such as watching television and "doing nothing" (Verma & Larson, 2003). In India's family-centered culture, middle-class urban eighth graders spend 39 percent of their waking hours with family. Similar findings have been reported in Indonesia, Bangladesh, Morocco, and Argentina (Larson & Wilson, 2004).

By comparison, US adolescents have a good deal of discretionary time. Approximately half of teens' waking hours outside of school are spent in discretionary activities (Larson & Verma, 1999). Americans

spend a great deal of this time on electronic media or interacting with friends, increasingly of the other sex, and less of this time, in comparison to other countries, on homework (Larson, 2001; Rideout et al., 2010). Some students participate in extracurricular activities such as organized sports, community work, or school clubs. In general, participation in these activities is associated with positive academic outcomes, a decrease in risk for internalizing and externalizing behavior, less alcohol and drug use, and increases in civic engagement following graduation from high school (Fredericks & Eccles, 2010; Sharp et al., 2015).

Both our discretionary time as well as our preferred companions shift and change over the course of the lifespan. However, across all these time periods, cultural variations in time use reflect important cultural needs, practices, and values.



How do you spend your free time?  
What do you think this says about what  
you value?

members (Flynn et al., 2017). A bidirectional process seems to be at work: Good relationships foster adjustment, which in turn fosters good relationships.

**Social Media and Electronic Interaction** We live in a brave new world of electronically mediated communication. More than 99 percent of teens and young adults use the internet (Van den Eijnden et al., 2008; Pew Research Center, 2021), approximately 95 percent of teens own or have access to a smartphone, and 88 percent have access to a computer in their home (Anderson & Jiang, 2018). As a group, adolescents are the primary users of electronic technologies, spending more time online than adults (Pew Research Center, 2012; Window on the World). Moreover, adolescents are heavy consumers of social media, with YouTube, Instagram, Snapchat, and Twitter reported as the most commonly used sites (Auxier & Anderson, 2021). Adolescents who are active users of social media sites, especially if they are not guarded about their personal privacy, are more vulnerable to online harassment and cyberbullying (Ang, 2015).

In general, screen-based media usage is related to poorer physical health, life quality, and family relationships (Iannotti et al., 2009). However, what type of media is used appears to be important. For example, studies indicate that instant messaging (van den Eijnden et al., 2008) and video game usage (Mathers et al., 2009) are associated with depression, whereas television is associated with obesity, socio-emotional problems, and lower self-esteem (Russ et al., 2009). Additionally, some people can develop problematic internet usage, a condition akin to addiction, in which continued internet and electronic

### checkpoint can you...

- Identify and discuss age and cultural differences in how young people spend their time?

communication use can impact everyday functioning, relationships, and overall well-being (Akin, 2012). Men, perhaps because of their generally greater interest in video games and online gaming, are at higher risk of developing addiction-related behaviors, although there are some indications that when women do develop similar difficulties, they may be more profoundly affected (Anderson et al., 2017).

Social media and electronic communication can also be used for the exchange of sexually charged conversation or explicit photographs, often referred to as sexting. A large cross-national meta-analysis of 34 studies including more than 110,000 respondents from the United States, Europe, Canada, Australia, South Africa, and South Korea suggested that about 14.8 percent of teens at an average age of approximately 15 years engaged in sexting (Madigan et al., 2018). Adolescents who do so tend to be sexually active and intend to share photos privately with a romantic partner (Kletke et al., 2014). Sexting has been linked with other risky behaviors, such as higher substance use, having concurrent sexual partners, and having more current sexual partners (Ybarra & Mitchell, 2014).

However, not all access to the internet is harmful. As access to the internet increased and technology became more sophisticated and easy to use, studies began to show that at times, online communication can stimulate rather than reduce social connectedness (James et al., 2017). For example, studies have found instant messaging can have a positive effect on relationship quality in adolescence (Valkenburg & Peter, 2009), and social competence in lonely adolescents can be strengthened using the internet to communicate with others and experiment with their identities (Valkenburg & Peter, 2008). This has been particularly true for sexual-minority youth, possibly because they often have difficulty finding partners or safe, supportive places in which to be themselves in real life (Korchmaros et al., 2015). It also served as a lifeline to many teens during the COVID-19 pandemic, allowing them to remain socially connected to others despite restrictions on movement and socialization (Hamilton et al., 2020).

Individuals often become unusually intimate in an online environment and feel free to express themselves. Because adolescents connect self-disclosure with quality friendships, this is linked to friendship quality and formation (Valkenburg & Peter, 2009), which in turn elevates social connectedness and well-being. However, there is a dark side to this. One aspect of online communication that enhances intimacy—anonymity—has made it appealing for electronic bullies. This, in conjunction with limited contextual cues, especially for teens whose parents do not monitor their child's online activities, increases the risk of cyberbullying (Ang, 2015). Estimates for prevalence rates across middle and high school vary widely, with cyberbullying perpetration reported from 1 to 41 percent, victimization from 3 to 72 percent, and cyberbully/victim rates from 2.3 percent to 16.7 percent (Selkie et al., 2016). Most studies on cyberbullying have been conducted in North America, but cross-cultural work also shows variable estimates across different countries, with countries such as Canada (23.8 percent) and China (23 percent) showing higher median prevalence rates and countries such as Australia (5 percent), Sweden (5.2 percent), and Germany (6.3 percent) having lower levels (Brochado et al., 2017).

As with other social relationships, technology is playing an increasingly large role in adolescent romantic relationships (Vaterlaus et al., 2017). For example, while most teens meet their romantic partners at school, some relationships do develop online (Korchmaros et al., 2015). Moreover, information available online via social media sites is often used to “check out” new romantic interests, gauge and signal interest in potential partners, and initiate communication (Subrahmanyam & Greenfield, 2008; Van Oystel et al., 2016). Once a relationship is established, social media may also be used to communicate daily, to convey affection, to argue, to publicly broadcast relationship status, and to break up and make up (Vaterlaus et al., 2017; Van Oystel et al., 2016). LGBTQ+ adolescents have been identified as especially likely to initiate online relationships, possibly because of a lack of partners or safe, supportive spaces in which to be themselves in real life (Korchmaros et al., 2015).

**Romantic Relationships** Romantic relationships are a central part of most adolescents' social worlds. This is not limited to Western countries. A survey of the anthropo-

logical literature spanning 166 cultures documented the evidence of romantic love in 147 of the cultures (Jankowiak & Fischer, 1992).

With the onset of puberty, most heterosexual boys and girls begin to think about and interact more with members of the other sex. Romantic relationships tend to become more intense and intimate across adolescence. By age 16, adolescents interact with and think about romantic partners more than about parents, friends, or siblings (Bouchey & Furman, 2003). Typically, romantic relationships move from mixed groups or group dates to one-on-one romantic relationships that, unlike other-sex friendships, are described as involving passion and a sense of commitment (Lantagne & Furman, 2017). While teens practice interacting with the opposite sex within the context of friendships, opposite-sex friends are unlikely to become romantic partners. Rather, romantic partners tend to come from different friendship networks (Kreager et al., 2016).

Early adolescents think primarily about how a relationship might affect their status in the peer group and pay little attention to attachment or support needs (Bouchey & Furman, 2003). By midadolescence, most young people have had at least one exclusive partner lasting for several months to about a year, and the effect of partner choice on peer status tends to become less important. Not until late adolescence or early adulthood, though, do romantic relationships begin to serve the full gamut of emotional needs that such relationships can serve and then only in relatively long-term relationships (Furman & Wehner, 1997).

As discussed earlier, relationships between and within different groups mutually influence each other. Thus, relationships with parents affect the quality of romantic relationships. For example, those teens who have a good relationship with their parents as teens have higher self-esteem and better relationship quality as young adults (Johnson & Galambos, 2014). Additionally, parental divorce and marital conflict is associated with poorer relationship quality in teens, expressed as low commitment and high conflict (Cui & Fincham, 2010; Cui et al., 2011).

*Intimate Partner Violence* Intimate partner violence (IPV) varies widely across countries, with rates from approximately 4 to more than 40 percent. It is most likely to be experienced by women with less power and wealth, younger women, and women in rural areas (Coll et al., 2020). IPV is the most common form of gender-based violence perpetrated against young girls. Approximately 15 million girls aged 15 to 19 years worldwide have experienced rape or sexual assault, and almost 1 in 3 has been the victim of physical, sexual, or emotional violence at the hands of their husband or romantic partner (UNICEF, 2021). IPV includes physical, emotional, or sexual violence, as well as stalking.

Statistics indicate that about 1 in 11 adolescent women and 1 in 14 adolescent men in the United States have experienced physical violence in their dating relationship (Centers for Disease Control and Prevention, 2021). Young women (1 in 8) are at higher risk for sexual assault than are young men (1 in 26) (Centers for Disease Control and Prevention, 2021). White students generally report lower levels of teen dating violence than African American or Hispanic students (Vagi et al., 2015).

Same-sex relationships are also affected by IPV. Same-sex IPV rates are similar to those in heterosexual relationships (Edwards et al., 2015), and as many as 3 in 10 adolescents in same-sex relationships report being verbally or psychologically abused (Halpern et al., 2003), with women, transgender, and Black teens at higher risk (Reuter et al., 2017). National studies indicate lifetime prevalence of physical violence, rape, or stalking by an intimate partner as comparable among heterosexual and gay men. However, bisexual women have a significantly higher prevalence of physical violence, rape, or stalking by an intimate partner than either heterosexual or lesbian women (Black et al., 2011). Although these rates indicate IPV occurrence, much less is known about specific risk factors and patterns of IPV perpetration among sexual-minority couples (Edwards et al., 2015).

In addition to the physical harm caused by this type of abuse, teens who are victims of dating violence are more likely to do poorly in school and to engage in risky behaviors such as drug and alcohol use. These students are also subject to eating disorders, depre-



Interacting with someone of the opposite gender interferes with cognitive processes—but only for men (Karremans et al., 2009).

- List several functions of the peer group in adolescence, and discuss the role of peer influence?
- Identify important features of adolescent friendships?
- Trace developmental changes in romantic relationships?

sion, anxiety, and suicide. Girls are disproportionately victims of severe violence (Mulford & Giordano, 2008; Centers for Disease Control and Prevention, 2021).

Risk factors that may predict violence include substance abuse, conflict and/or abuse in the home, and living in neighborhoods with high rates of crime and drug use (Child Trends, 2010, 2010). Additionally, attitudes about the acceptability of violence within relationships, poor family relationship quality, mental health problems, and the use of aggressive media also predict violence (Vagi et al., 2013). Peers are a particularly important influence. A meta-analysis found that a variety of peer behaviors, but especially peer dating violence, peers' aggressive and/or antisocial behavior, and being victimized by peers, were all significantly related to both dating violence perpetration and victimization (Garthe et al., 2017).

In the same way healthy relationships between parents, friends, and intimate partners mutually influence each other, so do unhealthy relationships. Survivors or perpetrators or IPV carry patterns of violence into future relationships, making adolescent dating violence a predictor of adult partner violence (Exner-Cortens et al., 2017).

## Antisocial Behavior and Juvenile Delinquency

What influences young people to engage in—or refrain from—violence or other antisocial acts? By what processes do antisocial tendencies develop?

### BIOLOGICAL INFLUENCES

Antisocial behavior is genetically influenced. Meta-analyses have concluded that genes influence approximately 50 percent of the variation in antisocial behavior within a population. Moreover, genetic influences are stronger for more serious offenders. Genes influence as much as 70 percent of the variance for teen offenders who begin to engage in antisocial behavior at younger ages, who persist in such behaviors over time, and who engage in more serious offenses (Beaver et al., 2018).

Neurobiological deficits, particularly in the portions of the brain that regulate reactions to rewards and punishments, may help explain why some children become antisocial adolescents. As a result of these neurological deficits, children may not receive or heed normal warning signals to restrain impulsive or reckless behavior (van Goozen et al., 2007), and they tend to have abnormal or blunted responses to events that generally evoke fear in others (Marsh et al., 2011).

Part of this abnormal physiological profile may involve arousal processes. Specifically, individuals who have low arousal levels may be prone to antisocial behaviors as a form of sensation seeking to achieve arousal levels that a typical person experiences. In support of this, high frontal EEG power (which is associated with low brain arousal) is associated with adolescent aggressive antisocial behavior in male twins (Niv et al., 2015). Low heart rate has also been found to be repeatedly associated with antisocial behavior in both men and women (Portnoy & Farrington, 2015; Hammerton et al., 2018).

Attentional processes may also be involved. Children, especially boys, with attention-deficit/hyperactivity disorder (ADHD) are at higher risk for the development of comorbid oppositional defiant disorder (ODD) and conduct disorder (CD), which contribute to antisocial behavior (Azereedo et al., 2018). There is some dispute about whether or not ADHD by itself is a direct risk factor for the development of antisocial behavior, although more recent research does seem to indicate this is the case (Storebø & Simonsen, 2016). For example, research has associated impulsivity with greater reactivity during the anticipation of rewards and decreased reactivity to loss in the brains of people high in antisocial behavior (Murray et al., 2018).

Also, findings of an MRI investigation of empathetic response have indicated that youth with aggressive conduct disorders have atypical responses to seeing others in pain

Can you hold a giggle in while others are roaring with laughter around you? Most people have trouble doing this. However, teens at high risk for the development of psychopathy don't. They show less brain activation across multiple brain regions in response to the laughter of others and, moreover, don't particularly care to join in (O'Nions et al., 2017). The researchers suggest the reduced response to the joy of others may be related to why people high in psychopathy tend not to form healthy intimate relationships.

(Decety et al., 2009). This may be because adolescents at risk for developing psychopathy do not process emotional information in the same way as their unaffected peers. For instance, imaging research shows abnormalities in the limbic structures of the brains of these adolescents related to the expression of callous-unemotional traits typically associated with psychopathy (Blair & Zhang, 2020). Moreover, those individuals who have traits associated with psychopathy seem to have reduced gray matter volume in the anterior rostral prefrontal cortex and temporal poles, areas involved in the processing of empathy, moral reasoning, and emotions such as shame and guilt (Gregory et al., 2012).

A crucial variable appears to be the age at which antisocial behavior begins. Researchers have identified two types of antisocial behavior: an early-onset type, beginning by age 11, which tends to lead to chronic juvenile delinquency in adolescence, and a milder, late-onset type, beginning after puberty, which tends to arise temporarily in adolescence (Moffitt, 2003). Late-onset adolescents tend to commit relatively minor offenses (Schulenberg & Zarrett, 2006) and tend to come from families with standard family backgrounds (Collins et al., 2000). Evidence suggests that early-onset offenders are likely different from very early on and seem to be more strongly influenced by biological factors. For example, such adolescents show poor impulse control, are aggressive, and tend not to think about their future (Barker et al., 2010; Monahan et al., 2009).

Biological influences alone, however, are not by themselves predictive of antisocial behavior. Research suggests environmental influences, including family, friends, and school, also affect gene expression (Gard et al., 2019).

## ENVIRONMENTAL INFLUENCES

Parents of children who become chronically antisocial have been found to use more harsh parenting and psychological control techniques (Pinquart, 2017). As children, these teens may get payoffs for antisocial behavior by receiving attention or getting their way when they act up. These early negative patterns pave the way for negative peer influences that promote and reinforce antisocial behavior. When constant criticism, angry coercion, or rude, uncooperative behavior characterizes parent-child interactions, the child tends to show aggressive behavior problems, which worsen the parent-child relationship (Buehler, 2006).

However, when parents show high warmth and low hostility, even delinquent teens tend to reduce their problematic behavior and behave more positively (Williams & Steinberg, 2011). Parents can also inoculate their teens from delinquency by spending more time with them (Sarwar, 2016). Adolescents whose parents know where they are and what they are doing are less likely to engage in delinquent acts (Flanagan et al., 2019) or to associate with deviant peers (Lloyd & Anthony, 2003). Teens who are open with their parents and disclose information are less likely to engage in antisocial acts (Criss et al., 2015), although it may very well be the case that teens who are engaging in acts their parents would not approve of are less likely to disclose.

Antisocial adolescents tend to have antisocial friends, and their antisocial behavior increases when they associate with each other (Monahan et al., 2009). The way antisocial teenagers talk, laugh, or smirk about rule-breaking and nod knowingly among themselves seems to constitute a sort of “deviancy training” (Dishion & Tipsord, 2011). Not all children respond in the same way, however. Teens who are genetically predisposed to antisocial behavior respond more strongly to maladaptive peer group norms than other children (Brendgen et al., 2015). Notably, peer influences can also be positive. For example, exposure to altruistic peers can buffer adolescents against the negative effects of violent or dangerous neighborhoods (Criss et al., 2017; Rious & Cunningham, 2018).

Family economic circumstances also influence the development of antisocial behavior. Poor children are more likely than other children to commit antisocial acts, and those whose families are continuously poor tend to become more antisocial with time (Piotrowska et al., 2015; Macmillan et al., 2004). Even within individual children,



*What are the chances this young man will become a hardened criminal? Teenagers who don't have positive alternatives are more likely to adopt antisocial lifestyles.*

garetswkshop/Shutterstock

those whose families rose out of poverty showed more delinquent behavior when their families had less money than when they were financially well off (Rekker et al., 2015). Gender matters as well. Boys, but not girls, who live in poor neighborhoods that border wealthier areas are at greater risk of antisocial behaviors than boys who live in areas of concentrated poverty, perhaps as a result of the feelings of unfairness the obvious social disparities may bring about (Odgers et al., 2015).

Weak neighborhood social organization in a disadvantaged community can influence delinquency through its effects on parenting behavior and peer deviance (Chung & Steinberg, 2006) as well as on norms about antisocial or violent acts (Stewart & Simons, 2010). For example, exposure to community violence and living in a dangerous community are strong predictors of future antisocial behavior

(Slatterly & Meyers, 2014; Criss et al., 2017). By contrast, collective efficacy—the strength of social connections within a neighborhood and the extent to which residents monitor or supervise each other's children—can positively influence outcomes (Odgers et al., 2009).

Culture might also be predicted to influence antisocial tendencies in youth as well. However, broadly conceived, the factors that influence the development of juvenile delinquency are similar across countries. Generally, when comparing high-, middle-, and lower-income countries, psychological factors (such as hyperactivity or conduct problems) are most important, followed by proximal risk factors (such as poverty and parenting practices). Distal risk factors (such as individualism versus collectivism) have the weakest associations with antisocial outcomes (Murray et al., 2018).

The vast majority of young people who engage in juvenile delinquency do not become adult criminals (Kosterman et al., 2001). Delinquency peaks about age 15 and then declines. Those most likely to persist in violence are those who had early antisocial influences. For example, teens who show antisocial behavior before the age of 15 are at higher risk of death, substance abuse, self-inflicted harm, crime, and poverty (Samuelson et al., 2010). Academic problems, school suspensions, and truancy in childhood and adolescence are also strongly associated with violent criminal offending in early adulthood (Katsiyannis et al., 2013).

## PREVENTING AND TREATING DELINQUENCY

Adolescents who have taken part in well-designed early childhood intervention programs are less likely to get in trouble than their peers who did not experience such programs (Piquero et al., 2016; Reynolds et al., 2011). Effective programs target high-risk urban children and last at least 2 years during the child's first 5 years. They influence children directly, through high-quality day care or education, and at the same time indirectly, by offering families assistance and support geared to their needs (Yoshikawa, 1994; Loeber et al., 2003). Once children reach adolescence, especially in poor, crime-ridden neighborhoods, interventions need to focus on spotting troubled adolescents and preventing gang recruitment (Tolan et al., 2003). Successful programs boost parenting skills through better monitoring, behavioral management, and neighborhood social support.

Programs such as teen hangouts and summer camps for behaviorally disturbed youth can be counterproductive because they bring together groups of deviant youth who tend to reinforce each other's deviancy. Similarly, programs such as Scared Straight, in which at-risk teens visit prisons and speak with inmates, tend to result in higher levels of delinquency and thus have fallen out of favor (Petrosino et al., 2013). Moving juveniles through the juvenile court system rather than diversion programs (such as counseling referrals) also tends to increase future offending (Petitclerc et al., 2013; Petrosino et al., 2013). More effective programs—scouts, sports, and church activities—integrate deviant youth into the nondeviant mainstream. Structured, adult-monitored, or school-based activities after school, on weekend evenings, and in summer, when adolescents are most likely to be idle and to get in trouble, can reduce their exposure to settings that encourage antisocial behavior (Dodge et al., 2006).

Fortunately, the great majority of adolescents do not get into serious trouble. Those who show disturbed behavior can—and should—be helped. With love, guidance, and support, adolescents can avoid risks, build on their strengths, and explore their possibilities as they approach adult life.

## checkpoint can you...

- Explain how parental, peer, and neighborhood influences may interact to promote antisocial behavior and delinquency?
- Identify characteristics of programs that have been successful in preventing or stopping delinquency and other risky behavior?

# summary and key terms

## The Search for Identity

- A central concern during adolescence is the search for identity, which has occupational, sexual, and values components. Erik Erikson described the psychosocial conflict of adolescence as *identity versus identity confusion*. The virtue that should arise from this conflict is *fidelity*.
- James Marcia, in research based on Erikson's theory, described four identity statuses: identity achievement, foreclosure, moratorium, and identity diffusion.
- Researchers differ on whether girls and boys take different paths to identity formation. Although some research suggests that girls' self-esteem tends to fall in adolescence, later research does not support that finding.
- Ethnicity, sexuality, and gender identity are important parts of identity. Minority adolescents seem to go through stages of identity development much like Marcia's identity statuses.

- identity** (353)
- identity versus identity confusion** (353)
- psychosocial moratorium** (353)
- fidelity** (353)
- crisis** (354)
- commitment** (354)
- identity diffusion** (354)
- foreclosure** (354)
- moratorium** (354)
- identity achievement** (354)
- sexual orientation** (354)
- LGBTQ+** (354)
- transgender people** (354)
- cultural socialization** (356)

## Sexuality

- Sexual orientation appears to be influenced by an interaction of biological and environmental factors and to be at least partly genetic.
  - Because of the lack of social acceptance, the course of homosexual identity and relationship development may vary.
  - Teenage sexual activity involves risks of pregnancy and sexually transmitted infections. Adolescents at greatest risk are those who begin sexual activity early, have multiple partners, do not use contraceptives, and are ill-informed about sex.
  - Regular condom use is the best safeguard for sexually active teens.
- Comprehensive sex education programs delay sexual initiation and encourage contraceptive use. Abstinence-only programs have not been as effective.
  - Teenage pregnancy and birthrates in the United States have declined.
  - Teenage childbearing often has negative outcomes. Teenage mothers and their families tend to suffer ill health and financial hardship, and the children often suffer from ineffective parenting.

**sexual orientation** (357)

**sexting** (359)

**sexually transmitted infections (STIs)** (360)

## Relationships with Family, Peers, and Adult Society

- Full-scale adolescent rebellion is unusual. For the majority of teens, adolescence is a fairly smooth transition. For the minority who seem more deeply troubled, it can predict a difficult adulthood.
- Adolescents spend an increasing amount of time with peers, but relationships with parents continue to be influential.
- Conflict with parents tends to be greatest during early adolescence. Authoritative parenting is associated with the most positive outcomes.
- Effects of family structure and maternal employment on adolescents' development may depend on such factors as economic resources, the quality of the home environment, and how closely parents monitor adolescents' whereabouts.
- Relationships with siblings tend to become more distant during adolescence, and the balance of power between older and younger siblings becomes more equal.
- The influence of the peer group is strongest in early adolescence. The structure of the peer group becomes more elaborate, involving cliques and crowds as well as friendships.
- Friendships, especially among girls, become more intimate, stable, and supportive in adolescence.
- Social media and electronic communication can be used in positive ways to establish social connections and increase intimacy, but they can also lead to negative effects, such as addiction-like behaviors or bullying.
- Romantic relationships meet a variety of needs and develop with age and experience.

**adolescent rebellion** (367)

**individuation** (367)

## Antisocial Behavior and Juvenile Delinquency

- Chronic delinquency generally stems from early-onset antisociality. It is associated with multiple, interacting risk factors, including ineffective parenting, school failure, peer and neighborhood influence, and low socioeconomic status.
- Programs that attack risk factors from an early age have had success.

## outline

Emerging Adulthood

### PHYSICAL DEVELOPMENT

Health and Fitness

Sexual Issues

### COGNITIVE DEVELOPMENT

Perspectives on Adult Cognition

Moral Reasoning

Education and Work

## learning objectives

Describe the transition from adolescence to adulthood.

Summarize physical development in young adults.

Discuss sexuality in young adults.

Characterize cognitive changes in early adulthood.

Identify examples of the roles of experience, culture, and gender in adult moral development.

Explain how emerging adults make the transitions to higher education and work.

# Physical and Cognitive Development in Emerging and Young Adulthood



Six\_Characters/E+/Getty Images

## did you know?

- US adults ages 20 to 40 are the most likely to be poor and the least likely to have health insurance.
- The tendency to engage in reflective thinking seems to emerge between ages 20 and 25.
- For both immediate and long-term cognitive benefits, going to college—any college—is more important than which college a person attends.

*In this chapter, we look at emerging and young adults' physical functioning and factors that can affect health, fitness, sexuality, and reproduction. We also discuss features of cognition and how education can stimulate its growth. We examine moral development and how that looks across different cultures. Finally, we discuss entering the world of work.*



**I**n a gentle way, you can shake the world.

—Gandhi, 1883–1944

## Emerging Adulthood

When does a person become an adult? Before the mid-twentieth century, a young man just out of high school typically would seek a stable job, marry, and start a family. For a young woman, the usual route to adulthood was marriage, which occurred as soon as she found a suitable mate.

Since the 1950s, the technological revolution has made specialized training increasingly essential. The ages at first marriage and childbirth shifted sharply upward as both women and men pursued higher education or vocational opportunities and as cohabitation, single parenthood, and gay and lesbian relationships became more socially acceptable (Lundberg & Pollack, 2014; Daugherty & Copen, 2016).

For many young people in industrialized societies, the late teens through the mid- to late-twenties has become a distinct period of the life span now known as **emerging adulthood**. It is a time during which young people are no longer adolescents but have not yet settled into adult roles. This period of the life span is marked by identity exploration and a focus on the self. Young adults commonly feel between life stages, and although life is often unstable, most acknowledge the possibilities the future may hold for them (Arnett, 2014).

This exploratory process is largely tied to development in Western countries, especially among relatively affluent young people. For example, in the United States, young adults from lower social classes generally report they attain adult status a few years earlier than those from higher social classes. This may be because poorer young adults experienced a more difficult childhood or the shouldering of adult responsibilities at a younger age, pushing them into maturity. Others, often due to financial constraints, do not attend college and so settle into a stable working life at an earlier age than do their wealthier counterparts (Arnett, 2016).

In Europe, high unemployment rates make one common marker of adult status, economic self-sufficiency, difficult to attain. This may delay perceived entry into adulthood (Arnett, 2014). In Japan, which before the COVID-19 pandemic had a more robust employment rate than Europe, young people reported reaching adulthood earlier (Crockett et al., 2015). Cultural values may also affect this process. Some of the concepts linked with emerging adulthood in Western countries, such as independence from parents and the establishment of a separate home, are viewed as less desirable in collectivistic cultures (Zhong & Arnett, 2014). Moreover, the negative impact of the COVID-19 pandemic on the global economy may alter this marker of adulthood.

Despite these differences, research across European countries, North America, and Asia suggests many commonalities in the paths young people take as they move toward adulthood (Arnett, 2014; Buhl & Lanz, 2007). Still, as we discuss aspects of emerging adulthood in this chapter, we must remember that, as with adolescence, emerging adulthood is a stage of the life span whose definition relies upon cultural context.



What criteria for adulthood do you consider most relevant? Do you think those criteria are influenced by the culture in which you live or grew up in?

### emerging adulthood

Proposed transitional period between adolescence and adulthood commonly found in industrialized countries.

### checkpoint can you ...

- Explain how entrance to adulthood has changed in industrialized societies?

# PHYSICAL DEVELOPMENT

## Health and Fitness

Young adults in the United States generally enjoy the benefits of good health, but they increasingly suffer from a range of health-related risks tied to modern lifestyles.

### HEALTH STATUS

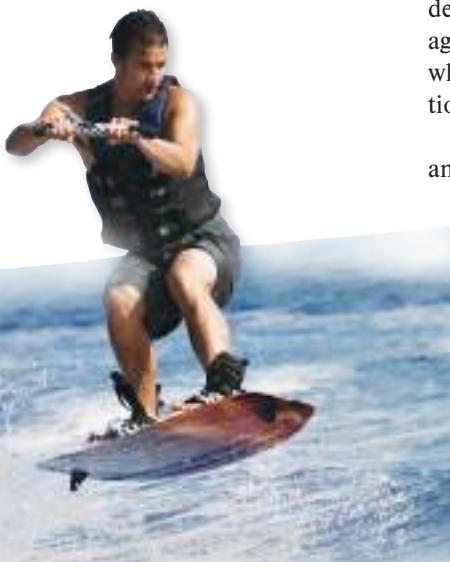
Globally, most young adults are in good health. Although in previous decades, death in younger populations was driven primarily by infectious diseases, more recently social causes—such as accidents, homicide, war, and interpersonal violence—have become more common (Blum & Nelson-Mmari, 2004).

In the United States, approximately 96 percent of adults 19 to 24 years of age report that they are in good to excellent health (National Center for Health Statistics, 2020). The habits that young adults develop during this time in the life span tend to become ingrained over time and are highly predictive of the likelihood they will experience good health at older ages (Liu et al., 2012).

Whites and Asians are the young adults most likely to be in good physical health. African Americans and Latinos report higher levels of obesity and are more likely to report poor health than Whites and Asians. These effects are mirrored if, rather than self-reported race, skin color is used as a metric. Darker individuals, especially women, report higher obesity, poorer health, and higher levels of depression, presumably as a response to perceived discrimination and the consequent stress. When respondents carry the intersectional characteristics of minority racial status as well as female gender, these effects are magnified (Perreira et al., 2019).

Lower socioeconomic status is consistently, although not invariably, associated with poor health (Braveman et al., 2010), and additional disparities are conferred by living in rural versus urban areas of the United States (Caldwell et al., 2016). Accidents, most commonly car accidents, are the leading cause of death for Americans age 15 to 24. Closely following this are suicides and homicides, both of which overwhelmingly occur via the use of firearms (Centers for Disease Control and Prevention, 2021).

Although the risk of death or severe complications such as respiratory distress and stroke as a result of COVID-19 infection is lower in younger adults than in older adults, it does exist (CDC COVID-19 Response Team, 2020; Oxley et al., 2020). A small percentage of young adults become seriously ill after infection, and this risk may increase when high blood pressure, cardiac disease, diabetes, or obesity is present (Wolff et al., 2021). Additionally, there are emerging indications that a proportion of people infected with COVID-19 will develop long COVID, a condition in which symptoms such as fatigue, shortness of breath, smell and taste dysfunction, and cognitive issues persist for an extended period of time (Yong, 2021). Young adults are not immune from this. In several studies conducted with young adults, approximately half of infected individuals continued to experience symptoms of COVID-19 for up to 6 months after infection (Walsh-Messinger et al., 2020; Blomberg et al., 2021). The young adult population, in which vaccination rates are relatively low, is predicted to experience a greater proportion of long COVID cases in the coming years. Although much remains unknown, it is increasingly likely the pandemic will be followed by increases in long-term disabilities (Briggs & Vassall, 2021). Estimates are that 1 in 5 young adults hospitalized with COVID-19 will develop a new disability (Evans et al., 2021). Disabilities, especially when they are not outwardly apparent, can have a significant impact on well-being (Research in Action).



*Wakeboarding takes strength, energy, endurance, and muscular coordination. Most young adults, like this young man, are in prime physical condition.*

Digital Vision/Getty Images

## HIDDEN DISABILITY: RHEUMATOID ARTHRITIS IN YOUNG ADULTS

When 25-year-old Camila shares that she has rheumatoid arthritis, she is often met with a skeptical look and a comment insinuating that arthritis is for old people. Although some disabilities and health conditions are readily apparent, many young adults suffer from hidden disabilities such as autism, neurological variations, or medical issues. Rheumatoid arthritis (RA), a painful chronic inflammatory disorder, is one such condition. RA generally presents as bilateral joint swelling and pain, localized and widespread stiffness, fatigue, and reduced quality of life (Halls et al., 2015; Wasserman, 2011).

Although onset of RA is most common between ages 30 and 50, it can affect individuals of all ages (Wasserman, 2011). Young adults diagnosed with RA face a unique set of challenges. Since arthritis is typically seen as an “old person’s disease,” dismissive comments such as “you’re young” and “you don’t look sick” can lead young adults to ignore early symptoms and delay seeking medical help and getting a diagnosis. Promptness of the initial diagnosis is essential to treating RA aggressively to prevent joint damage and preserve function.

Once diagnosed, young patients have to quickly make decisions that they did not anticipate making for several years. For one, a person living with an invisible illness has the added stress of deciding if, when, and how to disclose the disability in social and workplace settings (Valeras, 2010). Moreover, at what is often the height of sexual exploration, 36 to 70 percent of RA patients report decreased sexual desire, arousal, and

satisfaction due to fatigue, painful sexual positions, decreased physical ability, negative body image from increased weight, and depression and anxiety (Josefsson & Gard, 2010). Women of childbearing age with RA also face the difficult decision of deciding whether or not to have children because most RA medications can be detrimental to pregnancy (Wasserman, 2011).

In comparison with older adults, young adults who juggle several responsibilities such as school, work, housekeeping, child care, and social commitments are more likely to report feeling restricted by RA fatigue (Nikolaus et al., 2010). They also are more likely to report negative impact on relationships due to reduced social interaction and ability to participate in sports and outdoor activities (Lapsley et al., 2002). Finally, young adults with RA, who are likely still in the early stages of their careers and are not yet financially stable, are subject to the financial burden of costly disease-modifying antirheumatic drugs and frequent rheumatologist visits. Complementary therapies such as yoga (Evans et al., 2013) and changes to diet can pile on to the expenses.



What accommodations in educational and workplace settings should be made for individuals with rheumatoid arthritis? Can you think of other hidden disabilities that might impact how people function in daily life?

## GENETIC INFLUENCES ON HEALTH

Mapping the human genome has enabled us to examine more clearly the genetic roots of many disorders. The expression of any disorder—obesity, certain cancers, asthma—is the product of an interaction between genes and environment (Ritz et al., 2017).

For example, a number of genetic variants increase the likelihood of major depressive disorder in adulthood in response to early life stress. When raised in a supportive environment, a child with these variants is at no additional risk when compared to a child without the variants. However, in the absence of a supportive early environment, depression risk is elevated (Heim & Binder, 2012). The mechanism of action for increased depression risk is likely via genetic influences on neurobiological factors. In other words, genes that affect the action of hormone receptors, stress response systems, and synaptic plasticity may influence a person’s ability to respond adaptively to stressful events. This sensitivity may then make that person more reactive to the influence of environmental stress, especially when it occurs early in development (Hornung & Heim, 2014). Thus, it is not the gene in isolation nor is it the environment in isolation that leads to depression. Rather, it is the interaction of the two that is key. Similarly, genetic variants have been

The average American eats fast food about twice a week (Periera et al., 2005).



found to influence the outcomes of child maltreatment, the death of a parent early in life, and stressful life events in adulthood (Uher, 2014; Agid et al., 1999; Caspi et al., 2003).

## BEHAVIORAL INFLUENCES ON HEALTH

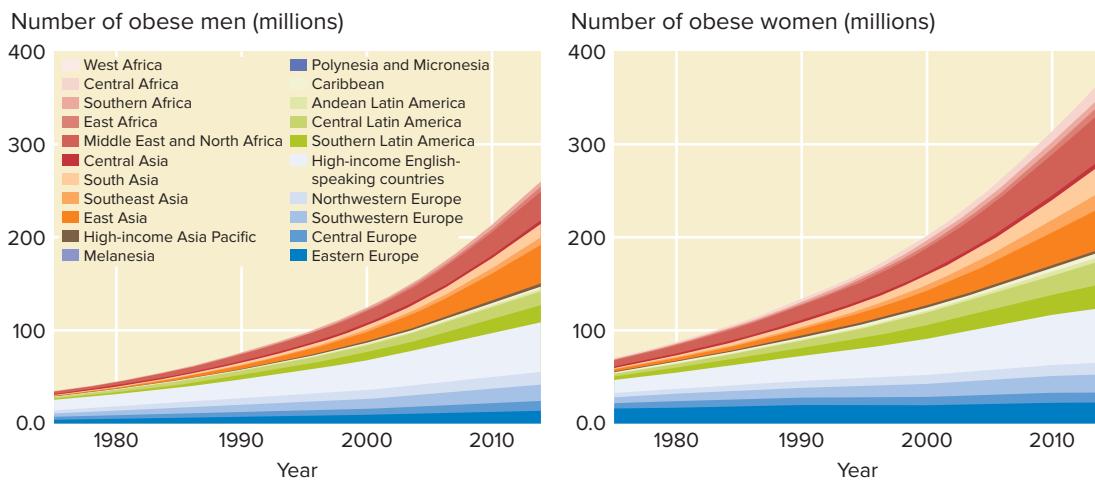
Many health risks are affected by modifiable behavioral factors. Unfortunately, knowing about good (and bad) health habits is not enough, and people do not always do what they should.

**Diet and Nutrition** What people eat and how much they move their bodies affect how they look, how they feel, and how likely they are to get sick and even die. Worldwide, poor diets and a lack of physical activity are among the leading causes of preventable diseases, overweight, and obesity (World Health Organization, 2021). In the United States, estimates are that half of premature deaths could be prevented via modifiable lifestyle factors, including improvements in diet and exercise, and quitting smoking (Yoon et al., 2014).

The World Health Organization recommends a diet rich in fruits, vegetables, whole grains, and unsaturated fats. Unfortunately, a healthy diet is not the norm across the globe. In 2017, 11 million deaths across the world could be attributed to dietary risk factors, including high salt intake, low consumption of whole grains, and a failure to include fruits in the diet (Afshin et al., 2019).

**Obesity and Overweight** Research on overweight and obesity in emerging adulthood is an important area of research as people are most likely to become obese at this time (GBD 2015 Obesity Collaborators, 2017). This is particularly true in the early twenties and especially so for those young adults who are already overweight (Lanoye et al., 2017). Factors such as moving out of the family home, decreases in income, and establishing independence make this stage of the life span a critical juncture for health.

Since 1975, the global obesity rate has nearly tripled. In 2016, there were 1.9 billion overweight adults, 650 million of whom were obese. Much of this increase can be attributed to unintended consequences of globalization, including increases in the availability of nutrient-poor, high-calorie processed foods and urbanization of the environment. While many countries now must address twin scourges of overweight and infectious diseases and undernutrition, overweight and obesity are linked to more deaths globally than underweight (UNICEF/WHO/World Bank Group, 2019; Figure 1).



**FIGURE 1**

### Global Trends in Body Mass Index, 1975–2015

Worldwide, obesity is growing. In 1975, approximately 34 million men and 71 million women were medically obese. By 2014, that number rose to 266 million men and 375 million women.

Source: NCD Risk Factor Collaboration (2016).

In the United States, the average man or woman is more than 24 pounds heavier than in the early 1960s but only about 1 inch taller (Flegal et al., 2010). In 2018, 42.4 percent of US adults were obese. If overweight and obesity are considered together (BMI greater than 25), some 73.6 percent of the US population meets the criteria (Fryar et al., 2020).

What explains the increases in obesity? Experts point to an increase in snacking, availability of inexpensive fast foods, supersized portions, labor-saving technologies, high-fat diets including highly processed foods, and sedentary recreational pursuits, such as television and computers. As in childhood and adolescence development, an inherited tendency toward obesity may interact with environmental and behavioral factors (Chouquet & Meyre, 2011; Albuquerque et al., 2015).

Obesity carries risks of high blood pressure, heart disease, stroke, diabetes, gallstones, arthritis and other muscular and skeletal disorders, and some cancers, and it diminishes quality and length of life. It is also associated with mental illness, most notably anxiety and depression. Notably, obesity significantly increases the risk of severe illness, hospitalization, and death for individuals infected with COVID-19 (Centers for Disease Control and Prevention, 2020). Estimates are that in 2018, obesity cost the United States approximately \$1.7 trillion a year in total health care spending and loss of productivity (Milken Institute, 2018). In addition to physical consequences, obesity also carries a risk of psychosocial consequences. People who are overweight or obese are more likely to experience stigma, low self-esteem, body dissatisfaction, anxiety, and depression (Williams et al., 2015; Papadopoulos & Brennan, 2015).

Lifestyle changes (dietary change plus exercise) or drug treatments can result in weight loss (LeBlanc et al., 2018; Khera et al., 2016), but such losses are difficult for many people to sustain for long periods of time. People who lose weight must fight both their physiology, which includes altered satiety and metabolic influences, as well as their propensity to return to earlier behaviors that contributed to their weight in the first place (MacLean et al., 2015). Weight-loss maintenance is possible but requires permanent lifestyle changes (Dombrowski et al., 2014; Montesi, et al., 2016). Only about 1 in 6 people is able to successfully lose and keep off 10 percent of their body weight (Kraschnewski et al., 2010).

Another option available for weight loss for obese adults is bariatric surgery. Bariatric surgery is any surgery that is carried out to induce weight loss, and it generally involves rerouting or removing parts of the stomach or small intestine. Bariatric surgery results in more consistent and sustained weight loss and a reduction in risk profile for obesity-related disease in most adults than diet or lifestyle changes. However, 10 to 17 percent of adults experience complications as a result of the surgery (Chang et al., 2014). Generally, bariatric surgery is an effective route only for the most obese adults (Williams et al., 2015). Current trends suggest that obesity and overweight will continue to be major health risk factors in the coming years.

**Food Insecurity** Estimates are that 1 in 3 people—or 2.37 billion individuals—did not have enough food to eat in 2020. Although in the previous 5 years, global food insecurity plateaued, the COVID-19 pandemic brought about a 1.5 percent increase in 2020 that was experienced by almost all low- and middle-income countries. Climate change, conflict, and economic downturns are also major drivers of food insecurity (World Health Organization, 2021).

Food insecurity exists in developed countries as well. In the United States, one representative study found 11 percent of adults 24 to 32 years old were food insecure. Food insecurity in young adults was associated with poor health, high blood pressure, obstructive airway disease, depression, anxiety, and sleep disorders (Nagata et al., 2019; Arenas et al., 2019).

**Physical Activity** In addition to helping maintain healthy body weight, physical activity builds muscles; strengthens heart and lungs; lowers blood pressure; protects against heart disease, stroke, diabetes, several cancers, and osteoporosis (a thinning of the bones that is most prevalent in middle-age and older women); relieves anxiety and depression; and lengthens life (Reiner et al., 2013). Moreover, research suggests that exercise is



Food tastes better if you look at it first  
(Biswas et al., 2021).

### checkpoint can you...

- Summarize the typical health status of young adults in the United States, and identify the leading cause of death in young adulthood?
- Give reasons for the obesity epidemic?
- Summarize the incidence and causes of food insecurity in different countries?



*Incorporating more activity into daily life, say, by biking to work instead of driving, can be as effective as structured exercise.*

LarsZ/Shutterstock

*Approximately 1 in 4 young Americans cannot join the military because they exceed the weight standards (Centers for Disease Control and Prevention, 2020).*



*Stressed out? Having a good laugh over a bad day might be helpful. Although the research is still equivocal, there are indications that humor can be an effective strategy for managing stress (Moran & Hughes, 2006).*



strongly related to cognitive functioning and that a healthy body is one of the variables related to the establishment and maintenance of a healthy mind (Guiney et al., 2015; Kramer et al., 2006).

Even moderate exercise has health benefits. Incorporating more physical activity into daily life—for example, by walking instead of driving short distances—can be as effective as structured exercise. Health benefits accrue from exercise no matter how much a person weighs. However, weight loss generally requires calorie restriction (Swift et al., 2018), and maintaining a healthy weight requires permanent physical activity and diet changes.

Unfortunately, although people are aware of the need to monitor their weight and establish healthy habits, this is easier said than done. Generally, adults ages 18 to 64 should engage in 75 to 150 minutes per week of aerobic exercise (depending on intensity levels) and muscle-strengthening activities, preferably spread across a week for substantial health benefits. Additional health benefits are gained by engaging in more than 300 minutes of physical activity a week, including muscle-strengthening activities on 2 or more days a week (Centers for Disease Control and Prevention, 2020). Despite the fact that the minimum guidelines represent less than half an hour a day of exercise, only about half of Americans meet these guidelines, slightly over 77 percent do not meet aerobic and strength training guidelines, and 15.2 percent report no physical activity at all (Centers for Disease Control and Prevention, 2018; Blackwell & Clark, 2018).

**Stress** A growing body of research suggests that our psychological health affects our physical health and that high levels of chronic stress are related to a host of physical and immunological impairments (Ho et al., 2010). Although most (70 percent) adults feel confident about their long-term ability to handle stress, approximately a third of adult respondents, the bulk of them young adults, report increased stress due to the COVID-19 pandemic and overall higher daily levels of stress than other age groups. This is particularly true for BIPOC, especially Hispanic adults. Most adults also report feeling stressed about work- and housing-related costs, family responsibilities, and personal health and safety (American Psychological Association, 2021).

Some young adults are more reactive to negative events than others (Howland et al., 2017). Young adults who have high self-esteem, are high in extraversion and low in neuroticism, or are religious may be better able to handle negative aspects of stressful events (Balgiu, 2017; Schwalm et al., 2021). In some cases, stress may lead young adults to engage in risky behaviors such as drinking or smoking (Pedersen, 2017; Suzuki et al., 2016). Also, stressed-out college students are more likely to eat junk food and less likely to exercise (Hudd et al., 2000), they tend to have poor quality or insufficient sleep (Lund et al., 2010), and their grades and health tend to suffer (Leppink et al., 2016).

There are also gender differences in how young adults typically cope with stress. Emotion-focused coping consists of attempts to manage the emotions associated with experiencing a particular event by such tactics as refusing to think about an issue or reframing the event in a positive light. Problem-focused coping involves addressing an issue head-on and developing action-oriented ways of managing and changing a bad situation (Lazarus & Folkman, 1984). College-age women are more likely to use emotion-focused strategies than are college-age men (Crăciun, 2013; Nolen-Hoeksema & Aldao, 2011). At the same time, college-age women experience overall higher levels of stress (Broughan et al., 2009).

**Sleep** Many emerging and young adults often go without adequate sleep. Among college students, family life stress, together with academic stress, is associated with high levels of insomnia (Lund et al., 2010). In a recent study of more than 1,300 undergraduate college students, 47 percent reported mild insomnia and 22.5 percent reported moderate to severe insomnia (Gress-Smith et al., 2015).

Sleep deprivation affects not only physical health but cognitive, emotional, and social functioning as well. A lack of sleep affects executive control (Lowe et al., 2017) and attentional processes, including the ability to inhibit (Anderson & Platten, 2011) or sustain (Lowe et al., 2017) attention, as well as the ability to rapidly shift attention from

# Window on the world

## INTERNET ADDICTION

About half of the global population—4.9 billion people—use the internet (United Nations, 2021). In 2008, global statistics for the average internet use for adults was 2.7 hours per day.

By 2017, that number had more than doubled, to 5.9 hours per day (Meeker, 2018). Although access to the internet and to the information available there has undoubtedly benefits, it also carries risks. Internet addiction (IA) is one such risk. IA is characterized by a compulsive need to engage in nonwork online activities to the point where such activities are interfering with family, social life, or work (Cash et al., 2012).

The prevalence of IA is estimated to be about 6 percent worldwide. However, countries with lower life satisfaction, more pollution and traffic, and a lower median income generally have higher rates of IA. The highest rates are found in the Middle East (10.9 percent) and the lowest in Northern and Western Europe (2.6 percent) (Cheng & Li, 2014). Overall, Asian countries have higher rates of IA than Western countries (Kuss et al., 2014), and IA is more common in men than women (Su et al., 2019). Data are not currently available for the African continent as a whole; however, internet access is rapidly increasing there. Thus, IA is predicted to become an issue there as well in the coming years (Cheng & Li, 2014).

Examples abound of the relationship between excessive internet use and poor outcomes. For example,

American college students who show signs of IA are more likely to have low life satisfaction, and American, Italian, Brazilian, Portuguese, and Turkish students who show signs of IA have lower self-esteem (Blachnio et al., 2019; Seabra et al., 2017; Bozoglan et al., 2013). In Hong Kong, IA is associated with poor academic performance, depression, and suicidal ideation (Chung et al., 2019). A study of nine European countries showed an association between obsessive-compulsive behaviors and paranoid ideation with problematic internet usage and, in men, phobic anxiety (Laconi et al., 2018).

As the use of technology spreads beyond the borders of the developed world, we can expect to see the influence of this new risk spread. Indeed, use of the internet surged during the COVID-19 pandemic with an additional 782 million people accessing the internet since 2019 and is predicted to continue rising (United Nations, 2021). Although this is vital to modernization efforts, the introduction of these technologies is a double-edged sword.



What do your internet habits look like?  
Are there things you need to change to live a healthier life?

one task to another (Whitney et al., 2017). Sleep deprivation also affects working (Frenda & Fenn, 2016), long-term (Lowe et al., 2017), and prospective (memory for future events) memory (Grundgeiger et al., 2014). Not surprisingly, sleep deprivation is associated with poor academic performance (van der Heijden et al., 2018). Perhaps of even more concern, adults are 3 times more likely to get into a car crash if sleep impaired, and driving after not sleeping for 20 hours is equivalent to having a 0.08 blood alcohol level—the legal limit (National Safety Council, 2020). Adults 18 to 24 years, who are already in the highest accident risk group, are also the most likely to show declines in driving performance after not sleeping (Shekari Soleimanloo et al., 2017).

Sleep deprivation also feels bad. Sleep deprivation is associated with enhanced emotional reactivity to negative events and a dampened response to positive events (Kahn et al., 2013; O'Leary et al., 2017). Sleep-deprived people also report feeling sleepy, stressed, cold, confused, hungry, and irritable, and this effect is larger in younger than in older adults (Schwarz et al., 2019). It is also the case that negative emotions, especially stress, can negatively impact sleep quantity and quality in a bidirectional fashion (Yap et al., 2020; Konjarski et al., 2018).

Sleep deprivation is associated with mental illness and psychological disorders, including excessive use of electronics (see Window on the World). For instance, sleep depriva-



Poor cognitive performance due to sleep deprivation is why pulling an all-nighter for an exam is a bad idea.

tion has been linked to depression (Murphy & Peterson, 2015). Although sleep deprivation results in heightened negative responses to specific negative events in healthy people, in people with mood disorders, sleep deprivation results in a generalized negative emotional response to almost all events (O'Leary et al., 2017). Sleep deprivation has also been linked to anxiety disorders (Soehner & Harvey, 2012) and an increase in psychotic symptoms in healthy, sleep-deprived adults (Reeve et al., 2018).

Adequate sleep improves learning of complex motor skills and consolidates previous learning (Tucker et al., 2017). Compared to adults who did not sleep well the previous night, adults who had a good night's sleep were more engaged with their work the next day (Kühnel et al., 2017). Even a short nap can prevent burnout—oversaturation of the brain's perceptual processing systems (Mednick et al., 2002).



*Because smoking is addictive, it is hard to quit despite awareness of health risks. Smoking is especially harmful to African Americans, whose blood metabolizes nicotine rapidly, heightening their risk of lung cancer.*

Ryan McVay/Photodisc/Getty Images

**Smoking** Smoking causes cancer, stroke, lung disease, diabetes, and chronic obstructive pulmonary disease, as does second-hand smoke (Centers for Disease Control and Prevention, 2021). Tobacco smoking is the leading preventable cause of death worldwide, and it kills half of smokers. Globally, approximately 1.3 billion people smoke, over 80 percent of whom live in low- and middle-income countries. Direct tobacco use kills approximately 8 million people a year, and another 1.2 million people die as a consequence of exposure to second-hand smoke (World Health Organization, 2021).

Health care expenditures that result from smoking account for 5.7 percent of total global health care costs, and when both health care and productivity are considered together, they account for 1.8 percent of the global annual gross domestic product (Goodchild et al., 2018). Smoking also exerts an economic burden on individuals, particularly those from poor countries, who divert their income to tobacco products rather than essential needs such as food (World Health Organization, 2021).

Approximately 15.3 percent of men and 12.7 percent of women over age 18 in the United States are current smokers. Smoking rates are higher among Native Americans/Alaska Natives (20.9 percent), Whites (15.5 percent), and African Americans (14.9 percent) and lower in Hispanic adults (8.8 percent) and Asian Americans (7.2 percent). Smoking is strongly associated with socioeconomic level as well. Adults who are poor, lack health insurance, or have low levels of education are more likely to smoke (Centers for Disease Control and Prevention, 2020). In recent years, e-cigarettes have become more popular, and currently 4.5 percent of adults smoke e-cigarettes (Centers for Disease Control and Prevention, 2021).

Smoking causes more than 480,000 deaths each year in the United States, and it has killed 10 times more Americans than were killed in all the wars fought by the United States (Centers for Disease Control and Prevention, 2021). Smoking is expensive, not just for individuals but for governments too. More than \$225 billion a year are spent in direct medical care for smokers, and lost productivity accounts for an additional \$156 billion (Centers for Disease Control and Prevention, 2021).

The primary reason people continue to smoke even when they would prefer to stop is the addictive nature of nicotine, a substance found in tobacco. Nicotine is as addictive as heroin and cocaine (National Institute on Drug Abuse, 2012; Centers for Disease Control and Prevention, 2010). A tendency to addiction may be genetic (Ware & Munafo, 2015), and the link between genetic susceptibility and likelihood of addiction is strongest for those who begin to smoke at a young age (Weiss et al., 2008).

Giving up smoking reduces the risks of heart disease, cancer, and stroke. Nicotine chewing gum, nicotine patches, drugs such as bupropion (Zyban) or varenicline (Chantix), and nicotine nasal sprays and inhalers, especially when combined with counseling, can help addicted persons quit smoking (Centers for Disease Control and Prevention, 2021). Although early research on the effectiveness of replacing cigarettes with e-cigarettes as part of a smoking cessation program was somewhat promising (Cahn & Siegel, 2011), more recent research suggests that people who switch to e-cigarettes are less likely to quit smoking (Kalkhoran & Glantz, 2016).

Quitting smoking is difficult, and many smoking cessation programs have low success rates. Still, almost 60 percent of US adults who had ever smoked have quit. However,

fewer than one-third of smokers who try to quit use proven smoking cessation therapies, and only 1 in 10 manages to quit over the course of a year (Babb, 2017). Media campaigns, especially graphic pictorials, have been shown to reduce smoking in countries in which they have been instituted, as have bans on promoting and advertising tobacco products. Increasing the price of cigarettes, generally via taxation, is another method that has been shown to reduce smoking. For every 10 percent increase in tobacco product prices, there is a 4 to 5 percent drop in smoking rates (World Health Organization, 2021).

**Alcohol Use** Approximately 2.3 billion people in the world drink alcohol, although rates vary by region. The average drinker consumes 32.8 grams of alcohol a day, but this number is 20 percent higher in Africa and 20 percent lower in Southeast Asia (Poznyah & Rekve, 2019).

The United States is a drinking society, and alcohol use peaks in emerging adulthood. Among adults ages 18 to 25, 54.3 percent reported drinking alcohol in the past month, and almost 34 percent had an episode of binge drinking in the past month (SAMHSA, 2021; Figure 2). Binge drinking is generally defined as five or more drinks on one occasion for a man and four or more drinks on one occasion for a woman.

College is a prime time and place for drinking, and college students tend to drink more frequently and more heavily than their noncollege peers. In 2017, nearly 52.5 percent of full-time college students ages 18 to 22 had used alcohol in the past month as compared to 44 percent of their noncollege peers. Moreover, 8.2 percent of college students drank heavily, and 33 percent engaged in binge drinking (NIAAA, 2021).

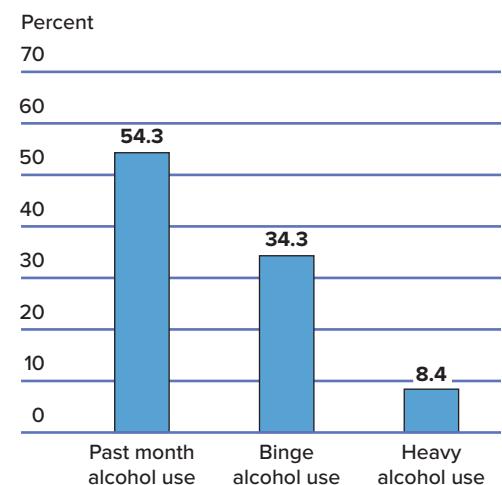
Individual variables affect the likelihood of alcohol consumption. For example, race and ethnicity can affect drinking patterns. The group reporting the highest consumption of alcohol is Native Americans, followed by Whites, and the lowest levels of use are reported by Central Americans, African Americans, and Asian Americans (Wallace et al., 2005). Gender affects consumption patterns as well, with females generally consuming less alcohol overall as well as having lower levels of binge drinking (National Institute on Alcohol Abuse and Alcoholism, 2021).

There are both short- and long-term risks to alcohol use. Short-term health risks include injuries and accidents, such as falls, car accidents, and drowning. Additionally—not surprisingly given alcohol’s tendency to lower inhibitions—its use is also associated with homicide, suicide, sexual risk-taking, sexual assault, and intimate partner violence. Although light to moderate alcohol consumption is not harmful, heavy drinking over the years may lead to high blood pressure, cardiac disease, stroke, various cancers, cirrhosis of the liver, damage to the nervous system, psychoses, and other medical problems (Centers for Disease Control and Prevention, 2021). Academic consequences are common for college students (National Institute on Alcohol Abuse and Alcoholism, 2021). One-third of vehicle fatalities are alcohol-related, and estimates are that there are 121 million alcohol-impaired driving events annually (Jewett et al., 2015).

## INDIRECT INFLUENCES ON HEALTH

Apart from the things people do, or refrain from doing, that affect their health directly, there are indirect influences on health. Among these are income, education, and race/ethnicity as well as health care access, which varies across these groups, and the potentially buffering effects of relationships.

**Socioeconomic Status** The connection between socioeconomic status (SES) and health has been widely documented (Williams et al., 2016). Higher-income people rate their health as better and live longer than lower-income people (National Center for Health Statistics, 2020). This finding exists across a wide variety of countries and is most marked in countries with high income inequality (Lago et al., 2018). Education is important too. The less



**FIGURE 2**  
Current (Past Month)  
Alcohol Use, Binge Drinking,  
and Heavy Alcohol Use  
among Adults Ages 18 to 25,  
2019

Source: SAMHSA (2020).

## checkpoint can you ...

- Cite the benefits of exercise?
- Explain why sleep deprivation is harmful?
- Discuss trends and risks involved in smoking and alcohol use?



*Living in poverty, as do these young women in a shelter, can affect health through poor nutrition, substandard housing, and inadequate health care.*

Stockbroker/MBI/Alamy Stock Photo

schooling people have had, the greater the chance that they will develop and die from communicable diseases, injuries, or chronic ailments, or that they will become victims of homicide or suicide (National Center for Health Statistics, 2020).

This does not mean that income and education cause good health; instead, they are related to environmental and lifestyle factors that do. Better-educated and more affluent people tend to have healthier diets and better preventive health care and medical treatment. They exercise more, are less likely to be overweight, smoke less, are less likely to use illicit drugs, and are more likely to use alcohol in moderation (National Center for Health Statistics, 2020; SAMHSA, 2020). The less affluent are also more likely to live close to a polluting facility (Mohai et al., 2009) and show elevated levels of lead and other toxins in their blood (Bellinger, 2008).

**Race and Ethnicity** Although the differences are somewhat smaller than in the past, there are still vast disparities in health and health care access as a function of race and ethnicity (Zimmerman & Anderson, 2019). However, because many minorities in the United States also tend to have a lower SES, many health issues stem from that rather than from minority status per se. But factors associated with SES do not tell the whole story.

For example, even when controlling for SES, African Americans are more likely to suffer from and die of heart disease (Williams et al., 2016). Moreover, African Americans are more likely to be diagnosed with diabetes and more likely to eventually die from the disease as well (Kirk et al., 2006). African Americans are also over 60 percent more likely than White people to die in young adulthood, in part because young Black men are far more likely to be victims of homicide (NCHS, 2017). Although African Americans smoke less than White Americans, they metabolize more nicotine in the blood, face higher risks of lung cancer, and have more trouble breaking the habit. Similarly, given equal alcohol consumption, African Americans have more liver damage and higher alcohol-related mortality (Williams, 2012; Caraballo et al., 1998). BIPOC are also more likely to test positive for COVID-19, be admitted to intensive care, and have worse outcomes than White people (Magesh et al., 2021; Hooper et al., 2020).

Why do these differences exist? Some of the explanation may be found in the discrimination levied against people of color, both at the individual and the systemic levels. For example, the repeated experience of discrimination and the subsequent elevations of stress hormones over time can lead to declines in health (Williams et al., 2019). Moreover, unconscious biases on the part of physicians can negatively impact health care. Research shows BIPOC tend to receive lower-quality health care, fewer referrals, and less treatment than White people do, even when insurance status, income, age, and severity of conditions are similar (Smedley et al., 2003). Moreover, when physicians score higher on measures of implicit racial bias, these tendencies are exaggerated (Van Ryn et al., 2011).

Some influences exist at the systemic level. For instance, a large body of research links racial segregation to health disparities (White & Borrell, 2011). This relationship may exist in part because BIPOC tend to live and be clustered in areas of concentrated poverty. Such neighborhoods tend to have poor-quality housing, (e.g., increased exposure to environmental toxins), social conditions (e.g., crime, violence), and other characteristics (e.g., lack of safe parks and outdoor space, high stress) that make it more difficult for people to enjoy the benefits of a healthy lifestyle (Williams et al., 2019).

**Health Care Access** The pandemic has put the importance of health care in sharp relief. In the past, young people had the lowest levels of health insurance of any age group, in part because young adults generally age out of many social service programs

at the same time they move away from home and begin living independently (Callahan & Cooper, 2005; Park et al., 2006). The implementation of the Affordable Care Act in 2010 resulted in sharp increases in health care access, health care utilization, and reported health indicators in young adults (Barbaresco et al., 2015; Sommers et al., 2015) until the individual mandate was repealed by the Trump administration in 2017. As a result of the repeal, the percentage of young adults without health insurance began to rise once again (Griffith, 2020).

The long-term effects of the changes in the health care system were eclipsed by the COVID-19 pandemic. Because of the resultant historic job losses and high unemployment, many previously insured people lost health insurance. Given continuing effects of the pandemic and because most health insurance coverage is tied to employment, it is likely the percentage of uninsured people will continue to be high, particularly in those states that opted not to expand Medicaid and particularly so in young adults (Bureau of Labor Statistics, 2020; Garfield et al., 2020).



*This happily married couple is the picture of good health. Although there is a clear association between relationships and health, it's not clear which is the cause and which is the effect.*

Don Hammond/Design Pics

**Relationships and Health** Social relationships seem to be vital to health and well-being. For example, social integration—active engagement in a broad range of social relationships, activities, and roles—has repeatedly been associated with lower mortality rates (Holt-Lunstad et al., 2010; Holt-Lunstad et al., 2015) and with increases in well-being over time (Chopik, 2017). A recent multicountry meta-analysis of 51 studies found wide friendship networks were protective against depression (Santini et al., 2015). Moreover, having a wide social network and multiple social roles is associated with a reduced risk of high blood pressure (Cuffee et al., 2014) and even a decreased susceptibility to colds (Cohen et al., 2015). In contrast, loneliness, social isolation, and low-quality relationships are associated with increased risk of heart disease, stroke, depression, and anxiety (Valtorta et al., 2016; Teo et al., 2013; Teo et al., 2013). Online social networking sites, such as Instagram, can provide some of these benefits of social interaction and support (Hobbs et al., 2016; Ellison et al., 2007).

Why does social support affect well-being and health? Some of the processes may be mediated by stress hormones such as cortisol. In other words, the beneficial effects of social integration may in part be due to the decreases in stress levels that strong social ties can engender (Grant et al., 2009). Additionally, in highly stressful situations, people who are in touch with others are more likely to eat and sleep sensibly, get enough exercise, and avoid substance abuse, and are less likely to be distressed, anxious, depressed, or even to die (Cohen, 2004; Thoits, 2011).

It is important to note that relationships can also be a source of stress. Negative interactions, as a whole, are damaging. For instance, strain in relationships has been found to be predictive of chronic illness and lower well-being (Chopik, 2017; Walen & Lachman, 2000), and negative social exchanges are predictive of declines in physical health (Edwards et al., 2001). Relationship stress may also lead to unhealthy behavior patterns—such as smoking or drinking—in attempts to manage the unpleasant arousal that can result (Cacioppo & Cacioppo, 2014).

Marriage tends to benefit health (Robles et al., 2014). Married people, particularly in young adulthood, tend to be healthier physically and psychologically than those who are never-married, cohabiting, widowed, separated, or divorced (Schoenborn, 2004). Dissolving a marriage or a cohabitation tends to have negative effects on physical or mental health or both—but so, apparently, does remaining in a bad relationship (Wu & Hart, 2002). People in an unhappy marriage have poorer health than single adults, and even a supportive network of friends and family does not buffer this effect (Holt-Lunstad et al., 2008). High conflict, in particular, is associated with a host of negative outcomes, including poor immune system functioning, higher blood pressure, poor cardiovascular health, and even death (Segrin & Flora, 2017).

### checkpoint can you . . .

- Point out differences in health and mortality that reflect income, education, and race/ethnicity?
- Discuss how relationships may affect physical and mental health?

## MENTAL HEALTH PROBLEMS

The freedom to make life decisions and choose diverse paths is often liberating, but the responsibility to rely on oneself and to become financially self-supporting can be overwhelming. Let's look at some specific disorders that can occur in young adulthood: alcoholism, drug abuse, and depression.

### alcoholism

Chronic disease involving dependence on use of alcohol, causing interference with normal functioning and fulfillment of obligations.

**Alcoholism** Alcohol consumption is responsible for 5.3 percent of deaths worldwide, numbering some 3 million people every year. This number is even more striking with adults age 20 to 39; 13.5 percent of deaths for this stage in the life span are attributable to alcohol. Moreover, alcohol is a causal factor in more than 200 diseases and injuries (World Health Organization, 2018).

Alcohol dependence, or **alcoholism**, is a long-term physical condition characterized by compulsive drinking that a person is unable to control. The heritability of a tendency to alcoholism is about 50 percent (Verhulst et al., 2015). In the United States, estimates are that approximately 8 percent of adults aged 18 to 22 years meet the criteria for alcohol use disorder, with somewhat higher numbers found in college students than in working adults (National Institute on Alcohol Abuse and Alcoholism, 2021).

Alcoholism, like other addictions, seems to result from long-lasting changes in patterns of neural signal transmission in the brain. Exposure to the addictive substance (in this case, alcohol) creates a euphoric mental state accompanied by neurological changes that produce feelings of discomfort and craving when the substance is no longer present. Alcoholics, like drug addicts, develop a tolerance for the substance and need more and more to get the desired high (National Institute on Alcohol Abuse and Alcoholism, 1996).

Treatment for alcoholism may include detoxification (removing all alcohol from the body), hospitalization, medication, individual and group psychotherapy, and referral to a support organization, such as Alcoholics Anonymous. Although not a cure, treatment can give alcoholics new tools to cope with their addiction and lead productive lives.

**Drug Use and Abuse** Use of illicit drugs peaks at ages 18 to 25; 24.9 percent of this age group report using illicit drugs during the past month. Usage rates drop sharply during the twenties and then continue to decline, albeit more slowly as people enter later adulthood and old age (SAMHSA, 2021).

As in adolescence, marijuana is by far the most popular illicit drug among young adults. In 2020, 34.5 percent of 18- to 25-year-olds had used marijuana within the previous year (SAMHSA, 2021). In general, although a substantial proportion of young adults will experiment with alcohol, cigarettes, or marijuana, a much smaller proportion will try other drugs such as ecstasy, methamphetamines, or heroin, and an even smaller number will become chronic and heavy users of illegal drugs (Johnston et al., 2013). The most common habit-forming drugs include marijuana and prescription painkillers, followed by cocaine and heroin (Lipari & Van Horn, 2017). Despite the relatively moderate prevalence numbers for heavy abuse, drug abuse nonetheless results in significant costs to the user personally and to society at large.

People with substance use disorders are likely to also have mood or anxiety disorders (Hunt et al., 2020; Hunt et al., 2016; Lai et al., 2015). The causal relationship here is unclear. It may be that the use of illegal drugs puts young people at risk for the development of a variety of psychopathologies. Alternatively, it could be the case that those people who suffer from psychological distress self-medicate and thus are more prone to addiction and other risky behaviors.

People who score high on androgyny—those who have both masculine and feminine attributes—are less likely to experience depression (Lin et al., 2021).



**Depression** Adolescence and emerging adulthood appear to be sensitive periods for the onset of depressive disorders. Starting about age 13, rates of depression begin to rise, first in girls and then in boys. Rates continue to increase through adolescence and early adulthood, with the early gender difference peaking in adolescence and then declining somewhat in adulthood (Salk et al., 2017; Salk et al., 2016). Globally, the prevalence of depression appears to be on the rise (Moreno-Agostino et al., 2021).

A recent meta-analysis including data from 90 nations indicated young women are more likely to suffer from a major depressive episode. This difference in prevalence begins about age 12, peaks in adolescence, and then declines slightly. Somewhat paradoxically, gender differences in depression rates are largest in countries with more gender equity (Salk et al., 2017). Women are also more likely than men to show atypical symptoms, to have an additional psychopathology along with their depressive disorders, and to attempt (but not succeed in) suicide (Gorman, 2006). In addition, women and men may respond to antidepressants differently, with women showing a greater likelihood of adverse drug reactions (Franconi et al., 2007).

## checkpoint can you... ...

- Discuss mental health problems common in emerging and young adulthood?

# Sexual Issues

Sexual and reproductive activities are often a prime preoccupation of emerging and young adulthood. Sexual behaviors and attitudes have changed, and there is more diversity and freedom in experiences now than in the past. Still, emerging adults are at risk for sexually transmitted infections (STIs), and young women may suffer from menstrual disorders.

## SEXUAL BEHAVIOR AND ATTITUDES

Sexual behaviors and attitudes across different nations vary widely. Generally, extramarital affairs, homosexuality, and abortion are viewed the most negatively (Pew Research Center, 2014), although younger and more educated adults are more likely to accept homosexuality and same-sex marriage. Still, adults in most countries, especially with a majority orthodox (i.e., religiously conservative) population, do not hold positive views about same-sex marriage (Pew Research Center, 2017).

Premarital sex is more likely to be considered acceptable in developed than developing countries. In some countries, including Iran, Morocco, Pakistan, Saudi Arabia, Somalia, and Sudan, premarital sex is illegal. Nonetheless, the number of adults who have premarital sex appears to be rising, with changes in China serving as a particularly striking example. Even in countries with negative views about premarital sexual activity, such as India, Indonesia, and Iran, prevalence is rising (Chamie, 2018). Some of this change is likely due to the increase in availability of and knowledge about contraceptives. Across different countries, most adults view contraception as morally acceptable, and only about 14 percent of adults say the use of contraceptives is immoral (Pew Research Center, 2014).

Today almost all never-married, noncohabitating U.S. adults—81.5 percent—have had vaginal intercourse before marriage (Copen et al., 2016). Increasingly, American adults agree with statements about the acceptability of premarital sex for adults over the age of 18 and cohabitation (Daugherty & Copen, 2016). According to a nationally representative in-person survey of men and women ages 18 to 44 years, 86.2 percent of women and 87.4 percent of men have had oral sex, 35.9 percent of women and 42.3 percent of men have had anal sex, and 94.2 percent of women and 92 percent of men have had vaginal intercourse (Copen et al., 2016).

Emerging adults tend to have more sexual partners than in older age groups, but they have sex less frequently. People who become sexually active during emerging adulthood rather than adolescence tend to engage in fewer risky behaviors—those that may lead to STIs or unplanned pregnancies (Lefkowitz & Gillen, 2006). The most common contraceptives are the birth control pill, female sterilization, and condoms. There has been a recent rise in the use of the IUD and a decline in the use of male sterilization (Kavanaugh & Jerman, 2018).

Casual sex (hooking up) is fairly common, especially on college campuses. Sexual assaults on women are also a problem in this age group. Both are often associated with other, nonsexual risky behaviors such as drinking and drug use (Santelli et al., 2007). Although college students are becoming less judgmental and more open-minded about sexual activity, a double standard still exists: Men are expected to have more sexual freedom than women (Kreager et al., 2016).



Kissing occurs in over 90 percent of cultures. When kissing, men tend to prefer wetter kisses using more tongue. Furthermore, research has shown that 66 percent of women can be put off by a bad kisser (Hughes et al., 2007).



Sexting is common in emerging adulthood. Approximately 38 percent of young adults send sexts. And 41.5 percent of young adults report receiving sexts from others, approximately 15 percent of which are nonconsensual (Mori et al., 2020).

The acceptability of homosexual unions is growing, especially in younger cohorts and in women (Daugherty & Copen, 2016), although religious adults, especially evangelical Protestants, are less likely to be supportive of same-sex relationships (Pew Research Center, 2019). With respect to sexual orientation, 1.3 percent of women and 1.9 percent of men reported they were homosexual, and 5.5 percent of women and 2 percent of men reported they were bisexual (Copen et al., 2016). Although estimates of the transgender population are more difficult to determine, roughly 0.10 to 0.39 percent of the US population is transgender (Flores et al., 2017; Meerwijk & Sevelius, 2017).

By emerging adulthood, most lesbian, gay, bisexual, and transgender persons are clear about their sexual identity (Pew Research Center, 2013). In general, more recent generations in the United States are coming out at an earlier age, and men are more likely to come out at an earlier age (by approximately 2 years) than women. Ethnic-minority youth are equally likely to be open about their sexual orientation to their friends, but they are more likely to keep this information secret from their parents (Grov et al., 2006).

## SEXUALLY TRANSMITTED INFECTIONS

Sexually transmitted infections (STIs), also known as sexually transmitted diseases (STDs), are illnesses that are transmitted by having sex. Every day, 1 million people are infected with an STI.

There are roughly 30 bacteria and viruses that can cause STIs. Four of the most common STIs—syphilis, gonorrhea, chlamydia, and trichomoniasis—are currently curable with antibiotics. The other four common STIs—hepatitis B, herpes, human immunodeficiency (HIV), and human papillomavirus (HPV)—are viral, and although some of their symptoms can be controlled, they cannot be cured (World Health Organization, 2021).

Worldwide, approximately 37.9 million adults are living with HIV, 62 percent of whom have access to some form of medical treatment. Over two-thirds of people infected with HIV live in Africa (World Health Organization, 2021). Key populations at risk include men who have sex with men, people who inject drugs, prison inmates, sex workers, and transgender people (World Health Organization, 2021). With highly active anti-viral therapy, death rates of persons diagnosed with HIV have dropped dramatically, although a person diagnosed with HIV who receives medical treatment is still likely to live about 7 fewer years than an uninfected person (Marcus et al., 2020).

By far, the highest rates of STIs in the United States are among emerging adults ages 18 to 25 (Centers for Disease Control and Prevention, 2018). People age 15 to 24 years account for 20 percent of the total prevalence rate and about half of all new infections (Satterwhite et al., 2013). The risk has been rising: For 5 years in a row, chlamydia, gonorrhea, and syphilis all showed increases in prevalence and are currently at an all-time high. Moreover, the risk is higher among certain ethnic groups. For example, there are elevated rates of STIs in African American men and women, and the lowest rates are found in Asian Americans (Centers for Disease Control and Prevention, 2019).

In 2020, reported STI rates showed a sharp decline. Given this decline was then followed by a surge in reported cases later in the year, it was most likely due to the disruption of monitoring and medical services due to COVID-19 rather than a true decline in the incidence of STIs (Pagaoa et al., 2021).

A variety of interventions have been used to try to stem the tide of STI infections, particularly with respect to HIV. Unfortunately, interventions providing information, education, and peer interventions have not generally been successful. However, interventions providing male circumcision (which reduces risk of transmission), pre-exposure prophylaxis (a vaccine reducing risk of transmission), and the provision of condoms and needle and syringe exchange programs have shown more success (Krishnaratne et al., 2016).

### **premenstrual syndrome (PMS)**

Disorder producing symptoms of physical discomfort and emotional tension for up to 2 weeks before a menstrual period.

## MENSTRUAL DISORDERS

**Premenstrual syndrome (PMS)** is a disorder that produces physical discomfort and emotional tension for up to 2 weeks before a menstrual period. Symptoms may include

fatigue, headaches, swelling and tenderness of the breasts, swollen hands or feet, abdominal bloating, nausea, cramps, constipation, food cravings, weight gain, anxiety, depression, irritability, mood swings, tearfulness, and difficulty concentrating or remembering (ACOG, 2021). Cross-culturally, women report PMS at a rate of about 50 percent, with a range of 10 to 98 percent (Direkvard-Moghadam et al., 2014).

The cause of PMS is not fully understood, but it appears to be a response to normal monthly surges of the female hormones estrogen and progesterone as well as to levels of the male hormone testosterone and of serotonin, a brain chemical (Biggs & Demuth, 2011). Smoking and alcohol consumption may put women at increased risk for the development of PMS (Choi & Hamidovic, 2020; del Mar Fernández et al., 2018). Caffeine, which women are sometimes counseled to avoid, does not appear to be associated with PMS (Purdue-Smithe et al., 2016).

The symptoms of PMS can sometimes be alleviated through aerobic exercise, eating frequent small meals, a diet high in complex carbohydrates and low in salt, and regular sleep routines. Calcium, magnesium, and vitamin E supplements may help. Medications may relieve specific symptoms; for example, a diuretic for bloating and weight gain (ACOG, 2021). There are also indications that vitamin D supplementation may help alleviate symptoms (Arab et al., 2019).

PMS may include the presence of cramps, but it is not the same thing. PMS can be confused with dysmenorrhea (painful menstruation, or cramps). Cramps tend to affect younger women, whereas PMS is more typical in women in their thirties or older. Dysmenorrhea is caused by contractions of the uterus, which are set in motion by prostaglandin, a hormonelike substance; it can be treated with prostaglandin inhibitors, such as ibuprofen (Wang et al., 2004). Dysmenorrhea is found cross-culturally and estimated to affect up to 91 percent of women. Depending on country, 2 to 28 percent of women report experiencing severe symptoms that interfere with activities (Ju et al., 2014).



Aerobic exercise has many benefits, among them, the alleviation of PMS.

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# COGNITIVE DEVELOPMENT

## Perspectives on Adult Cognition

Developmentalists have studied cognition from a variety of perspectives. Here, we address different perspectives on cognition in young adulthood.

### PIAGETIAN APPROACHES

Piaget believed the pinnacle of cognitive development was formal operations thought. However, some developmental scientists maintain that changes in cognition extend beyond that stage.

**Postformal Thought** Research and theoretical work since the 1970s suggest that mature thinking is more complex than the formal operations reasoning Piaget described. This higher stage of adult cognition, which tends to emerge in early adulthood and is associated with higher education, is sometimes called **postformal thought** (Labouvie-Vief, 2006).

Postformal thought is characterized by the ability to deal with inconsistency, contradiction, and compromise. Life is messy and complex, and some people are better able to deal with its inherent uncertainty. Thus, postformal thinking is in some ways as much a personality style as it is a mode of thinking.

#### postformal thought

Mature type of thinking that relies on subjective experience and intuition as well as logic and allows room for ambiguity, uncertainty, inconsistency, contradiction, imperfection, and compromise.

Why is it so much more irritating to listen to a cell phone conversation than a conversation between two physically present people? Well, as we only hear half the conversation, it takes more work to interpret and understand this "halfologue"—which is why it's more distracting (Emerson et al., 2010).

#### reflective thinking

Type of logical thinking that becomes more prominent in adulthood, involving continuous, active evaluation of information and beliefs in the light of evidence and implications.

Ever see seminars or classes offered that claim to be able to help you think with your right brain and therefore release your creative juices more effectively? Although it sounds nice, unfortunately, there doesn't seem to be any scientific basis for these types of claims. A review of 72 neuroimaging studies showed no relationship between creativity and right brain activation (Dietrich & Kanso, 2010).

#### checkpoint can you . . .

- Differentiate between reflective and postformal thinking?
- Tell why postformal thought may be especially suited to solving social problems?

Another characteristic of postformal thought is its flexibility. At times, formal logical thought is the appropriate tool to solve a problem. But other times, especially in ambiguous circumstances, the fruits of experience can help us understand a situation more effectively. Postformal thought draws on intuition and emotion as well as logic to help people cope with situations such as social dilemmas, which are often less clearly structured and are fraught with emotion (Berg & Klaczynski, 1996; Sinnott, 2003).

Postformal thought is also relativistic. Immature thinking tends to be black and white: There is one right answer and one wrong one. Relativistic thought, by contrast, acknowledges that there may be more than one valid way of viewing an issue. Relativistic thinking often develops in response to events or interactions that open up unaccustomed ways of looking at things and challenge a simple, polarized view of the world. Research has found a progression toward postformal thought throughout young and middle adulthood (Blanchard-Fields & Norris, 1994).

**Reflective Thinking** Reflective thinking was first defined by the American philosopher and educator John Dewey (1933) as "active, persistent, and careful consideration" of information or beliefs. Reflective thinkers continually question facts, draw inferences, and make connections. Reflective thinkers can also create complex intellectual systems that reconcile apparently conflicting ideas or considerations; for example, by putting together various theories of human development into a single overarching theory that explains many different kinds of behavior (Fischer & Pruyne, 2003).

Reflective thinking comes online slowly and in predictable stages. First, young adults engage in dualism and see the world in black and white with little subtlety. Authorities are viewed as having the answers, and ambiguity is not well tolerated. This is followed by multiplicity, in which different viewpoints are seen as potentially all having value. Now, the world is full of gray areas. Next is the development of contextual relativism, where the merits of different solutions to problems are considered with an understanding that some answers may be better than others. Last is commitment within contextual relativism, in which young adults become skilled at using evidence to evaluate solutions or answers but also understand that the best answer may depend on context and value systems.

What drives this change? Overall, exposure to diversity, especially with respect to race (often the most salient dimension), leads to increases in cognitive complexity. This influence is strongest when it takes the form of interpersonal interactions rather than, for example, coursework or workshops (Bowman, 2010; 2013). For example, discussions that include mixed-race participants produce greater novelty and complexity of ideas than all-White discussions (Antonio et al., 2004).

These findings have implications for affirmative action and enrollment decisions. Some have argued that a diverse group of students and high academic quality are competing priorities (Bowman, 2010). Research suggests, by contrast, a different story. Those campuses with more diverse student bodies tend to show greater amounts of interracial friendships rather than continued or increased segregation (Fischer, 2008). This integration then contributes to academic achievement and intellectual gains (Gurin et al., 2003).

Although American college students do seem to pass through these stages of logical thinking, later research has shown they are not a human universal. For instance, research with Chinese students shows an opposite pattern of cognitive development than American students, with relativistic thinking highest in freshmen and lowest in seniors (Zhang, 2004). Additionally, several programs of research have shown the tendency to engage in reflective thought is more a characteristic of educational experiences than age and is also contingent upon the domain in which the question is asked and the knowledge a young person has of important components of the domain (King & Kitchener, 2004).

## TRIARCHIC THEORY OF INTELLIGENCE

The triarchic theory argues intelligence is comprised of three elements: componential, experiential, and contextual knowledge (Sternberg, 1985, 1987). Componential knowl-

edge includes analytical abilities or “book smarts,” which can help students sail through examinations and receive high grades when in school. However, componential knowledge is not always sufficient to do well in life. Also important are experiential elements (how insightful or creative a person is) and contextual knowledge (the practical aspect of intelligence). When original thinking is expected, experiential intelligence—including fresh insights and original ideas—may be more important. Practical, contextual intelligence, or “street smarts,” is also important outside of academic settings. Practical knowledge allows people to do well across a variety of contexts and adapt to new conditions.

An important aspect of practical intelligence is **tacit knowledge**: “inside information,” “know-how,” or “savvy” that is not formally taught or openly expressed. Tacit knowledge is commonsense knowledge of how to get ahead—how to win a promotion or cut through red tape. It is not well correlated with measures of general cognitive ability, but it may be a better predictor of managerial success (Sternberg et al., 2001).

Tacit knowledge may include self-management (knowing how to motivate oneself and organize time and energy), management of tasks (knowing how to write a term paper or grant proposal), and management of others (knowing when and how to reward or criticize subordinates) (Smith, 2001). Tacit knowledge, seems to be unrelated to IQ and predicts job performance better than do psychometric tests (Herbig et al., 2001; Sternberg et al., 1995).

## EMOTIONAL INTELLIGENCE

Peter Salovey and John Mayer (1990) coined the term **emotional intelligence (EI)**. It refers to four related skills: the abilities to perceive, use, understand, and manage, or regulate, emotions—our own and those of others—so as to achieve goals. Emotional intelligence enables a person to harness emotions to deal more effectively with the social environment. It requires awareness of the type of behavior that is appropriate in a given social situation.

To measure emotional intelligence, psychologists use the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) (Mayer et al., 2002), a 40-minute battery of questions that generates a score for each of the four abilities, as well as a total score. The test includes such questions as, “Tom felt anxious and became a bit stressed when he thought about all the work he needed to do. When his supervisor brought him an additional project, he felt (a) overwhelmed, (b) depressed, (c) ashamed, (d) self-conscious, or (e) jittery. While mean scores for these four categories differ by country, the test is valid cross-culturally (Karim & Weisz, 2010).

Emotional intelligence affects the quality of personal relationships. Studies have found that college students with high emotional intelligence are more likely to report positive relationships with parents and friends (Lopes et al., 2003), provide emotional support to their close friends in time of need (Lopes et al., 2004), and score higher on well-being measures (Lanciano & Curci, 2015). Emotional intelligence is also protective against risky behaviors such as smoking, drinking, and drug use (Rivers et al., 2013). College-age couples in which both partners have high emotional intelligence report the happiest relationships, whereas couples who are low in emotional intelligence are the most unhappy (Brackett et al., 2005). Generally, women score higher on emotional intelligence measures than do men (Lanciano & Curci, 2015).

Emotional intelligence also affects occupational success and is associated with constructive conflict management, especially among subordinates (Schlaearth et al., 2013); higher salaries and more promotions (Lopes et al., 2006); lower job stress, especially for married men (Naseem, 2018); psychological attachment to the workplace (Akomolafe & Olatomide, 2013); and going over and above job duties by choice (Miao et al., 2017). Low levels of emotional intelligence have been associated with engaging in nonwork activities while at work, boredom, procrastination, and undermining the goals or interests of an organization (Wan et al., 2014; Miao et al., 2017).



We remember more events from our young adult years than at any other point in the life span, a phenomenon known as the *reminiscence bump* (Janssen et al., 2007).

### tacit knowledge

Sternberg's term for information that is not formally taught but is necessary to get ahead.

### checkpoint

can you...

- Tell why Sternberg's three kinds of intelligence may be especially applicable to adults?

### emotional intelligence (EI)

Salovey and Mayer's term for the ability to understand and regulate emotions; an important component of effective, intelligent behavior.



Generally, we think of the capacity to empathize with others as a good thing. But what if you work in a job where you frequently see people in pain? Research has shown that doctors suppress this empathetic response, allowing them to focus on treatment more effectively (Decety et al., 2010).

- Explain the concept of emotional intelligence and how it is tested?

Ultimately, acting on emotions often comes down to a value judgment. Is it smarter to obey or disobey authority? To inspire others or exploit them? “Emotional skills, like intellectual ones, are morally neutral. . . . Without a moral compass to guide people in how to employ their gifts, emotional intelligence can be used for good or evil” (Gibbs, 1995, p. 68). Let’s look next at the development of that “moral compass” in adulthood.

## Moral Reasoning

Recall that Kohlberg broke moral development into three stages. In the final stage, postconventional morality, Kohlberg believed that people became capable of fully principled moral reasoning and that they made moral decisions on the basis of universal principles of justice. Kohlberg argued that most people did not reach this level until their twenties, if at all (Kohlberg, 1973). He believed that the acquisition of this style of thinking was primarily a function of experience. In particular, when young people encounter values that conflict with their own (as might happen in college or foreign travel) and when they are responsible for the welfare of others (as in parenthood), their development of moral reasoning abilities increases.

There is some support for the view that experience may lead adults to reevaluate their criteria for what is right and wrong. Students who attend church are less likely to cheat on a task than those who attend church less regularly (Bloodgood et al., 2008). On the other hand, people exposed to war (Haskuka et al., 2008) or who suffer from posttraumatic stress disorder as a result of combat experience (Taylor, 2007) show a reduced tendency to reach Kohlberg’s higher levels of moral reasoning. In short, personal experiences can affect the likelihood of engaging in certain types of moral reasoning.

Shortly before his death, Kohlberg proposed an additional seventh stage of moral reasoning. He believed it was possible for people to achieve “a sense of unity with the cosmos, nature or God,” which enabled them to see moral issues from “the standpoint of the universe as a whole” (Kohlberg & Ryncarz, 1990, pp. 191, 207). Rather than seeing morality as tied to justice, adults at this stage might instead reflect on the question, “Why be moral?”

A critique leveled at Kohlberg’s approach involves his belief that people from certain cultures were more likely to attain the highest levels of moral reasoning (Jenson, 1997). This underlying belief in the superiority of a particular worldview has been criticized as being biased toward Western cultural norms of individuality and a nonreligious mindset. For example, many cultures provide moral dictates focused on divine authority and tradition, and there is no reason for these beliefs to be viewed as morally inferior or as reflecting a less sophisticated form of reasoning (Shweder et al., 2006).

### THE THREE ETHICS

Cultures affect moral reasoning because important cultural values and goals, including those associated with religion, are reflected in the dominant ethical system of a culture. Cultures like that of the United States tend to focus on individual autonomy, whereas cultures like that of China are more concerned with group dynamics and harmony. This may help explain some of the cultural differences in moral reasoning. Whereas Kohlberg’s system is based on justice, the Chinese ethos leans toward conciliation and harmony. In Chinese society, people faced with moral dilemmas are expected to discuss them openly, be guided by community standards, and try to find a way of resolving the problem to please as many parties as possible. In the West, even good people may be harshly punished if, under the force of circumstances, they break a law. The Chinese are unaccustomed to universally applied laws; they are taught to abide by the decisions of a wise judge (Dien, 1982).

Some research has focused on the ways in which the varying world views present within different cultures shape the dominant ethical system. Richard Shweder has inves-

Which, if either, do you consider to be higher moral priorities: justice and rights, or compassion and responsibility?



Have you ever observed or had an experience with a person from another culture that revealed cultural differences in moral principles?



tigated clusters of moral themes and argues cultures are shaped by three major ethical systems (Shweder et al., 1997): the ethics of autonomy, community, and divinity.

The ethic of autonomy is characteristic of individualistic cultures, and it focuses on the rights of the individual and abstract concepts of justice. The ethic of community, more characteristic of collectivistic cultures, focuses on social connections, duty to others, group harmony, and respect for the structures that maintain social harmony. Last, the ethic of divinity views the person as a temporary vessel for a divine soul or sacred being. Moral dictates, in this view, center upon attaining holiness and endorse concepts related to sanctity or purity.

All three ethics exist in individuals from different cultures and have been documented, for example, in Brazil, Israel, Japan, New Zealand, and the United Kingdom (Guerra & Giner-Sorolla, 2015). However, their centrality varies by country, worldview, and age. For example, Americans are more likely to use the ethic of autonomy than people from Brazil or India (Haidt et al., 1993; Jensen, 1998). Additionally, both within and across countries, religiously liberal people are more likely to endorse the ethic of autonomy than are more religiously conservative people. Religiously conservative people as a whole are more likely to use the ethic of divinity than are religiously liberal people, although both groups frequently use the ethic of community (Jensen, 2011).

There are separate developmental trajectories for each ethic. The ethic of autonomy is present early in childhood, and a person's tendency to use it generally remains stable over time in all but the most collectivistic cultures. However, the type of autonomy reasoning may change with age. The ethic of community generally shows a slow and steady rise from childhood through adolescence and adulthood, perhaps as a consequence of an individual's primary interactions moving outside of the family to include friends, the formation of their own family, and the wider social world. The ethic of divinity, because it often consists of abstract religious principles, shows a different pattern. Here, at least in countries in which this ethic is common in adults, there are generally low levels in childhood and a sharper rise in adolescence and emerging adulthood that is concurrent with increased cognitive capabilities (Jensen, 2011).

### checkpoint can you...

- Give examples of the roles of experience and culture in adult moral development?
- Provide two critiques of Kohlberg's approach?
- Describe the Shweder's three ethics?

## Education and Work

Unlike young people in past generations, who typically could expect to move directly from school to work and financial independence, many emerging adults today do not have a clear career path. Some alternate between education and work; others pursue both at the same time. Most of those who do not enroll in postsecondary education or do not finish enter the job market, but many return later for more schooling (Furstenberg et al., 2005; Hamilton & Hamilton, 2006; NCES, 2005). Many enter non-degree credential or work experience programs (McFarland et al., 2018). And some combine college with marriage and child rearing (Fitzpatrick & Turner, 2007).

### COLLEGE

Access to higher education has not been and is not always available to everyone. It was not until 1823 that the first African American man in the United States graduated from college (Harper et al., 2009). Historically, women have generally also had less access. In colonial America, literacy was valued for women but only insofar as it allowed them



College enrollments in the United States are at an all-time high. More than 2 out of 3 high school graduates go right to college.  
Oleksii Didok/Shutterstock



Fewer than one-third of young adults have basic knowledge of interest rates, inflation, and risk diversification. Going to college helps: Higher education is associated with increases in financial literacy (Lusardi et al., 2009).



Despite increases in tuition and fees, data by the College Board suggests that long-term benefits of going to college still exist and are in fact growing (Ma et al., 2016).

to read religious texts. At Oberlin College in 1837, when women were for the first time admitted, their presence was as much for the purposes of doing the male students' laundry as it was for their own benefit (Conway, 1974). It took another 25 years until the first African American woman attended college in 1862 (Harper et al., 2009). In the United States today, socioeconomic status remains a key factor in whether or not young people attend and graduate from college (Walpole, 2003).

College is an increasingly important path to adulthood, though it is only one such path and, until recently, not the most common one (Montgomery & Côté, 2003). Between 1975 and 2019, the proportion of US high school graduates who went straight into a 2- or 4-year college grew from about half (51 percent) to more than two-thirds (66 percent) (Irwin et al., 2021).

College courses and even complete degree or certificate programs are now widely available by distance learning, in which courses are delivered via mail, email, the internet, or other technological means. About 6.35 million students took at least one online course during the fall of 2016, representing a third of all students (Seaman et al., 2018). In fact, online enrollment is now growing faster than traditional higher education enrollment numbers (Allen & Seeman, 2010). Colleges also are increasingly experimenting with hybrid courses, which utilize a mixture of both online and in-person techniques. In general, although students prefer to learn face-to-face (Aguilera-Hermida, 2020), research seems to suggest that learning outcomes are similar for online, hybrid, and traditional students, although a wide variety of variables can affect outcomes (Tallent-Runnels et al., 2006). It is likely the COVID-19 pandemic will necessitate continuing use of online and remote-learning technologies.

**Gender, Socioeconomic Status, and Race/Ethnicity** US college enrollment rates increased from 2000 to 2019. By fall of 2021, the second fall semester in the COVID-19 pandemic, undergraduate enrollment dropped by 5.8 percent from prepandemic levels (National Student Clearinghouse Research Center, 2021). In a continuing reversal of the traditional gender gap, a larger percentage of 18- to 24-year-old women (44 percent) enrolled in college than men (37 percent) (McFarland et al., 2019). Similarly, women have higher postsecondary enrollment rates than men in most European countries, as well as in Australia, Canada, New Zealand, Japan, and the Russian Federation (Buchmann & DiPrete, 2006; Sen et al., 2005). Since the mid-1980s, more US women have earned associate's, bachelor's, and master's degrees than men, and since 2005–2006, this has also become true for doctoral degrees (McFarland et al., 2019).

Still, gender differences are evident within some fields at the highest educational levels and, following graduation, within jobs in science, technology, engineering, and math (STEM) (Funk & Parker, 2018). In the United States, women remain more likely than men to major in traditionally women's fields, such as education, nursing, English literature, and psychology, whereas men are more likely to major in business and engineering (Wang & Degol, 2017; McFarland et al., 2019). Even so, women have made gains in almost every field, with math-intensive fields the only remaining fields where women have not attained equal or greater graduation rates with men (Wang & Degol, 2017).

In explaining the persistent disparities between men and women, a variety of factors appears to be important. Some researchers have pointed to cognitive differences in men and women at the upper end of the mathematical, visual, and spatial ability range, and to the more varied choices available to those women who are both mathematically and verbally skilled (Halpern et al., 2007; Wang et al., 2013). Other explanations center on women's interests and preferences, including those around work and family balance (Wang & Degol, 2017). The influence of gender stereotypes has also been proposed as important (Miller et al., 2015). Last, attention has also been drawn to women's persistent reports of gender discrimination in those fields in which the largest disparities between men and women can be found (Pew Research Center, 2018).

Socioeconomic status and race/ethnicity affect access to postsecondary education. In 2017, 78 percent of high school students from the highest family income quartile enrolled in college shortly after finishing high school. By contrast, only 46 percent of high school

students from the lowest family income quartile enrolled in college during a similar time period (Cahalan et al., 2018). College is expensive. In the 2017–2018 academic year, the average total net price of attendance at a public, four-year college or university for a full-time undergraduate was \$24,300. Private, nonprofit institutions were roughly double the cost at \$50,300, and private, for-profit institutions cost an average of \$32,200 (McFarland et al., 2019). From the 2004–2005 academic year to the 2014–2015 academic year, prices for tuition, room, and board rose 33 percent at public institutions and 26 percent at private, not-for-profit institutions (Snyder et al., 2016), making the attainment of higher education increasingly difficult for low- and middle-income families. Thus, many students from more modest circumstances are likely to work while attending college, which often serves to slow their progress (Dey & Hurtado, 1999). In addition, students from wealthier families are less likely to drop out of college before graduating (Hamilton & Hamilton, 2006).

Currently, the 6-year graduation rate is approximately 60 percent; however, the rate differs by ethnicity. The highest graduation rate is that of Asian students (73.3 percent), followed by White (64.3 percent), mixed race (57.1 percent), Hispanic (55 percent), and African American (39.8 percent). Minority college participation has risen at all levels. The percentage of college students who are minorities is rising, primarily due to increased numbers of Latinos, Pacific Islanders, and Asian Americans (McFarland et al., 2019). It is likely, given the current demographic composition of the United States, that this trend will continue.

Whether a person completes college may depend not only on motivation, academic aptitude and preparation, and ability to work independently but also on social integration and social support. Intervention programs for at-risk students have improved college attendance rates by creating meaningful bonds between students and teachers, finding opportunities for students to work while in college, providing academic assistance, and helping students see how college can move them toward a better future (Montgomery & Côté, 2003).

**Cognitive Growth in College** College can be a time of intellectual discovery and personal growth. In terms of both immediate and long-term benefits, going to college—any college—is more important than which college a person attends (Montgomery & Côté, 2003).

Many students come to college with rigid ideas about the world. They tend to believe there is a “right” answer that can be found and defended. As they begin to encounter a wider range of ideas and viewpoints, they are forced to examine their assumptions about the “truth.” As students gain more experience and think more deeply and from a greater wealth of accumulated knowledge, they begin to realize that much of knowledge and many values are somewhat relative. They realize that different individuals or cultures may hold different values than they do and thus see the world in different ways.

How do they decide what to believe? Ultimately, students achieve what has been called commitment within relativism. At this point, students decide for themselves what, ideally, they want to believe. They give credence to the inherent uncertainty of belief but feel confident in their choices and values and trust in their own opinions (Perry, 1970).

*Is social media good for you? It depends. Studies show that lurking—looking at other people's posts but rarely commenting—is associated with jealousy, social comparison, and declines in well-being. However, actively engaging with others is more likely to increase social connectedness and well-being (Verduyn et al., 2017).*



The future looks bright for this young woman. A college education is often the key to a successful career and a healthy, satisfying life.

SDI Productions/Getty Images

### checkpoint can you...

- Discuss factors affecting who goes to college and who finishes?
- Tell how college can affect cognitive development?

## ENTERING THE WORLD OF WORK

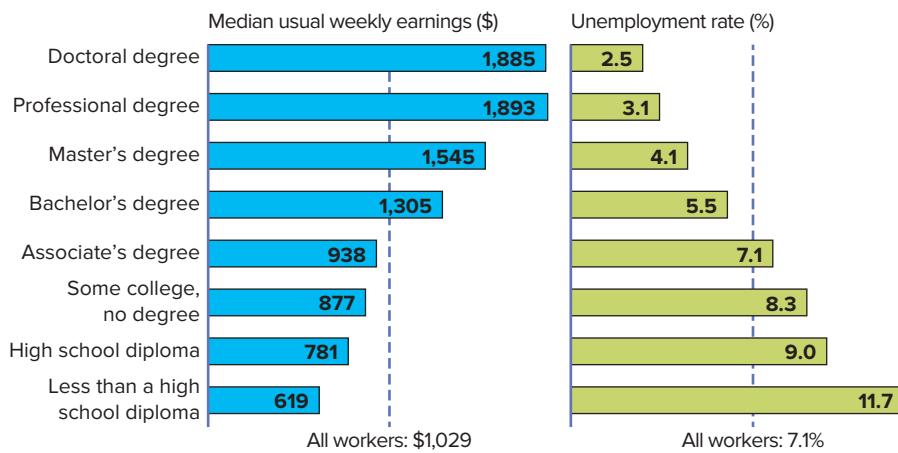
By their midtwenties, most emerging adults are either working or pursuing advanced education or both (McFarland et al., 2019). Those who enter the workforce face a rapidly shifting landscape. Whereas previous generations of employees often could expect to remain at a company from their start date until retirement, that pattern of employment is becoming increasingly rare. More and more adults are self-employed, working at home, telecommuting, on flexible work schedules, or acting as independent contractors. Moreover, the COVID-19 pandemic resulted in high unemployment rates, with workers under the age of 25 most likely to experience reductions in income or lose their jobs (US Bureau of Labor Statistics, 2022; Sternberg, 2020).

In the United States in 2017, adults age 25 to 34 who had a master's or higher degree and who were working full-time had a median income of \$65,000, a full 26 percent higher than those with a bachelor's degree (\$51,800) and 62 percent higher than those who had completed high school but had not attended college (\$32,000) (Figure 3). Moreover, for adults without sufficient education, unemployment rates are high. Young adults with a bachelor's degree or higher had an employment rate of 86 percent in 2017, whereas those who had not completed high school had an employment rate of 56 percent (McFarland et al., 2019).

These challenges may make it difficult to earn enough to establish an independent household. A cross-national survey in Belgium, Canada, Germany, and Italy found a decline in economic self-sufficiency among 18- to 34-year-old men and among women in their early twenties between the mid-1980s and 1995–2000 (Bell et al., 2007). And workers in their twenties, especially their early twenties, tend to be concentrated in low-wage, low-skilled positions and frequently change jobs (Hamilton & Hamilton, 2006).

Although income differentials between male and female workers exist at all levels of educational attainment, these gaps have narrowed considerably. Still, the median earnings of young men are higher than those of young women at every educational level (National Center for Education Statistics, 2019). In 1979, women earned 62 percent of what men did. In 2020, women earned 82 percent of men's income, and this gender gap in wages was greater for older women than for younger women (US Bureau of Labor Statistics, 2021).

**Unemployment rates and earnings by educational attainment, 2020**



**FIGURE 3**

### Median Weekly Earning by Highest Educational Attainment, 2020

*Even considering the cost of an education, higher educational levels mean more lifetime earnings.*

Source: US Bureau of Labor Statistics (2021).

### Combining Work and Schooling

In 2019, about 43 percent of full-time college students and 81 percent of part-time college students worked while attending college (McFarland et al., 2019). While part-time work has been found to have either few or positive effects on academic performance as long as a student does not work more than 15 hours a week, working more than 20 hours a week tends to have a negative impact (Pascarella et al., 1998) and is associated with a failure to graduate. Generally, there is a trade-off such that the more time students spend working, the less time they spend on academic pursuits (Greene & Maggs, 2015).

Working during college may also affect the likelihood of attending graduate programs. Although grants and loans are available to some students, many students must work to help support their educational aspirations. Such work cuts into the time they have available to engage in other activities, such as participation

in research groups, unpaid internships, and volunteer work. These activities are optional but allow students a more competitive application into graduate school. Therefore, although work itself may not be detrimental to an undergraduate education, it may be related to difficulties meeting criteria for graduate programs.

**Cognitive Growth at Work** Do people change as a result of the kind of work they do? Some research says yes: people seem to grow in challenging jobs, the kind that are becoming increasingly prevalent today. This research has revealed a reciprocal relationship between the **substantive complexity** of work—the degree of thought and independent judgment it requires—and a person's flexibility in coping with cognitive demands (Kohn, 1980).

A great deal of development in the frontal lobes occurs in young adulthood (Luciana, 2010). Magnetic resonance imaging shows that the most forward part of the frontal lobes has a special function and plays a major role in problem solving and planning. This portion of the brain springs into action when a person needs to put an unfinished task on hold and shift attention to another task. It permits a worker to keep the first task in working memory while attending to the second; for example, to resume reading a report after being interrupted by the telephone (Koechlin et al., 1999). Other aspects of brain development also influence why, as young people enter adulthood, they become less likely to take risks and are better able to control their behaviors (Luciana, 2010).

Cognitive growth need not stop at the end of the workday. According to the **spillover hypothesis**, cognitive gains from work carry over to nonworking hours. Studies support this hypothesis: substantive complexity of work strongly influences the intellectual level of leisure activities (Kohn, 1980; Miller & Kohn, 1983). This type of positive spillover is more likely when there are more resources at work, such as the latitude to make independent decisions and support from colleagues. (Grzywacz & Marks, 2000). Spillover such as this is associated with increased well-being (Sirgy et al., 2020).

#### substantive complexity

Degree to which a person's work requires thought and independent judgment.

#### spillover hypothesis

Hypothesis that there is a carryover of cognitive gains from work to leisure that explains the positive relationship between activities in the quality of intellectual functioning.

### checkpoint can you...

- Summarize recent changes in the workplace?
- Discuss the impact of combining work and schooling?
- Explain the relationship between substantive complexity of work and cognitive development?

## summary and key terms

### Emerging Adulthood

- For many young people in advanced technological societies, entrance into adulthood is not clearly marked; it takes longer and follows more varied routes than in the past. Some developmental scientists suggest that the late teens through the midtwenties has become a transitional period called emerging adulthood.
- Emerging adulthood consists of multiple milestones or transitions, and their order and timing varies. Passage of these milestones may determine when a young person becomes an adult.

**emerging adulthood** (383)

### PHYSICAL DEVELOPMENT

#### Health and Fitness

- Physical and sensory abilities are typically at their peak in emerging and young adulthood.
- Accidents are the leading cause of death in this age group.
- The mapping of the human genome is enabling the discovery of genetic bases for certain disorders.
- Lifestyle factors such as diet, obesity, exercise, sleep, smoking, and substance use or abuse can affect health, and survival, and may have epigenetic consequences for the regulation of when genes turn on and off.
- Good health is related to higher income and education. African Americans and some other minorities tend to be less healthy than other Americans. Although much of this is due to SES, there also are indications that people of different ethnicities might respond differently to some environmental influences on health.
- Social relationships, especially marriage, tend to be associated with physical and mental health.
- Mental health is generally good in early adulthood, but certain conditions, such as depression, become more prevalent.

**alcoholism** (394)

## Sexual Issues

- Almost all US young adults have sexual relations before marriage.
- Sexually transmitted infections and menstrual disorders can be concerns during young adulthood.
- The highest rates of STIs in the United States are among emerging adults, particularly among young women.  
**premenstrual syndrome (PMS)** (396)

## COGNITIVE DEVELOPMENT

### Perspectives on Adult Cognition

- Some investigators propose distinctively adult forms of cognition beyond formal operations. Reflective thinking emphasizes complex logic; postformal thought involves intuition and emotion as well.
- According to Sternberg's triarchic theory of intelligence, the experiential and contextual elements become particularly important during adulthood. Tests that measure tacit knowledge can be useful complements to traditional intelligence tests.
- Emotional intelligence plays an important part in life success.  
**postformal thought** (397)  
**reflective thinking** (398)  
**tacit knowledge** (399)  
**emotional intelligence (EI)** (399)

## Moral Reasoning

- According to Kohlberg, moral development in adulthood depends primarily on experience, though it cannot exceed the limits set by cognitive development. Experience may be interpreted differently in various cultural contexts, and not all cultures support Kohlberg's more advanced stages of moral development.
- The three ethics of autonomy, community, and divinity can be found cross-culturally, although their importance varies with cultural context.

## Education and Work

- A majority of emerging adults now go to college. More women than men now go to college, and an increasing percentage pursue advanced degrees even in traditionally male-dominated fields. Minority participation is growing. Many students enter college, but fewer graduate with a degree.
- College students' thinking tends to progress from rigidity to flexibility to freely chosen commitments.
- Research has found a relationship between substantive complexity of work and cognitive growth.
- Changes in the workplace call for higher education or training. Higher education greatly expands workplace opportunities and earnings.  
**substantive complexity (405)**  
**spillover hypothesis (405)**

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chapter

# 14

## outline

- Developmental Tasks of Emerging Adulthood
- Personality Development: Four Views
- Relationships in Emerging Adulthood
- Marital and Nonmarital Lifestyles
- Parenthood
- When Marriage Ends

## learning objectives

- Describe identity development and the relationship with parents in emerging adulthood.
- Summarize theoretical perspectives on adult personality development.
- Identify key aspects of intimate relationships and love.
- Characterize marital and nonmarital lifestyles.
- Discuss parenthood and the pressures on dual-income families.
- Identify trends in divorce and remarriage.

# Psychosocial Development in Emerging and Young Adulthood



Karol Moraes/Shutterstock

## did you know?

- Historically and across cultures, marriages arranged by parents or professional matchmakers are the most common means of finding a mate.
- Marital satisfaction typically declines after a couple has children.
- The sharpest decline in divorce rates is found in young adult couples.

*Personal choices made in emerging and young adulthood establish a framework for the rest of life. In this chapter, we examine the choices that frame personal and social life: adopting a sexual lifestyle; marrying, cohabiting, or remaining single; having children or not; and establishing and maintaining friendships. Although most research has been conducted with heterosexual, cisgender couples, when possible, we include information of a more diverse nature.*



**Y**ou have brains in your head. You have feet in your shoes. You can steer yourself any direction you choose.

—Theodor Geisel (1904–1991)

## Developmental Tasks of Emerging Adulthood

### PATHS TO ADULTHOOD

Paths to adulthood are more varied now than they have ever been (Arnett, 2014). Traditionally, adulthood was defined by markers such as moving out of the family home, marriage, children, full-time employment, or the establishment of a career. Today, although a wide variety of paths may be followed on the way to adulthood, three primary pathways increasingly characterize the trajectory of young adulthood in the United States (Scales et al., 2016).

The first group includes those young adults who begin families early and generally do not go to college. Early marriage and family formation are associated with poverty and substance use (Oesterle et al., 2010; Oesterle et al., 2011). Early parenthood, in particular, limits future prospects (Boden et al., 2008; Dariotis et al., 2011), especially for women who do not marry (Assini-Meytin & Green, 2015; Driscoll, 2014). However, not all consequences of teen pregnancy are negative. Sometimes a pregnancy can become a catalyst for change. Some young mothers who choose to carry an unintended pregnancy to term report fewer sexual partners and less substance use when compared to women who terminated an unintended pregnancy or women who had never been pregnant (Gomez-Scott & Cooney, 2014).

The second pathway includes those young adults who delay having children until young adulthood but who, rather than investing in college, move into full-time work. When compared to college graduates, these young adults bear more children by their thirties, work more hours, reach an income plateau, and depend more on government aid (Mitchell & Syed, 2015).

The third group involves emerging adults who delay parenthood and other traditional markers of adulthood in pursuit of educational or career goals (Oesterle et al., 2010; Eliason et al., 2015). This group tends to start in the most privileged place and have the most positive outcomes. In a longitudinal study that followed a nationally representative sample of high school seniors each year since 1975, emerging adults with the highest well-being were those who were not yet married, had no children, attended college, and lived away from their childhood home (Schulenberg et al., 2005).

*The occupational path you take when young can affect your outcomes decades later. For instance, financial stress during early to mid adulthood, in one study, led to increased physical pain 27 years later, an effect presumably mediated by the loss of control experienced by those under financial strain (Wickrama et al., 2021).*



### checkpoint can you...

- Give examples of various paths to adulthood?
- Discuss influences on paths young people take to adulthood?

## IDENTITY DEVELOPMENT

Emerging adulthood offers a moratorium, or time out, from developmental pressures and allows young people the freedom to experiment with various roles and lifestyles. However, it also represents a turning point during which adult role commitments gradually crystallize.

**The Contemporary Moratorium** Identity status research has found that only about a third of Western youth seem to go through what Marcia named the moratorium status, a self-conscious crisis that ideally leads to a resolution and identity achievement status. Approximately 15 percent seem to regress during emerging adulthood, and about half show no significant changes (Kroger et al., 2009). Rather than actively and thoughtfully exploring their identity, many young adults seem to do little active, conscious deliberation, instead taking a passive (diffused) approach or taking the lead from their parents (foreclosure). Nevertheless, about 3 out of 4 eventually settle on some sort of occupational identity by the end of their twenties. Identity confusion persists for 10 to 20 percent, who lack what Erikson called fidelity: faith in something larger than themselves (Côté, 2006). Religious and community involvement (for example, with volunteer activities or political campaigns) is associated with general increases in identity formation in emerging adults (Hardy et al., 2011), perhaps by giving young adults something to believe in.

**Ethnic and Cultural Factors in Identity Formation** The approach to the study of identity development was conceptualized within the United States, with its emphasis upon individualism and personal autonomy. However, in countries where the emphasis is on collectivism and focused more strongly on group membership, this model may not apply in the same fashion. For example, in a study conducted with China, Taiwan, Japan, and the United States, identity was accepted without much distress, exploration, or questioning in the less Westernized samples, yet still held a great deal of interpersonal meaning (Berman et al., 2011). While we might find this strategy—foreclosure—less adaptive in the United States, it may confer benefits in a different cultural context (Cheng & Berman, 2012). Gender also interacts with identity formation processes across cultures. Although in Western countries, men's and women's identity formation processes are relatively similar, this is not the case cross-culturally. In some indigenous cultures and developing countries, women are more often expected to marry shortly after puberty, whereas men are accorded more time before beginning a family (Schlegel, 2013).

Identity exploration is also different for racial/ethnic minorities within the bounds of the United States than for the majority White population. Ethnic identity can be defined as one's identity as a member of a particular ethnic group (Phinney, 2003), and it is part of the wider social identity of an individual (Tajfel, 1981). For majority-group youth, this process is often taken for granted. However, minority youth must come to understand themselves both as part of an ethnic group and as part of the wider, diverse society, and ideally to have a positive view of both the minority and majority cultures in which they live. Multiracial young people have the added challenge of figuring out where they fit in.

Many minority youth, often out of economic concerns, must take on adult responsibilities earlier than their peers. At the same time, they tend to value close and interdependent family relations and may feel obligated to assist their families financially. They may be under pressure to marry and have children at an early age or to enter the workforce immediately rather than spending years in higher education. Thus, for them, some of the processes of emerging adulthood may be curtailed (Phinney, 2006).

The formation of an achieved and positive ethnic identity has beneficial effects on variables such as depression, perceived stress, coping, social competence, self-esteem, well-being, internalizing and externalizing symptomatology, academic achievement, and health risks. These effects are generally small to moderate in size but have been found across a multitude of studies, especially for Black adults (Rivas-Drake et al., 2014; Rivas-Drake et al., 2014; Smith & Silva, 2011). Because a secure ethnic identity involves positive feelings about both one's own personal identity (Yip, 2014) and the wider cul-

ture (Phinney, 1989), it is not surprising to find that secure ethnic identity is also related to greater acceptance of other groups (Phinney et al., 1997). Presumably, then, such feelings might result in more positive interactions between different groups and reductions in discrimination (Phinney et al., 2007). Moreover, a strong sense of ethnic identity may help young adults weather discrimination and stereotyping (Schwartz et al., 2013).

**Religious Identity Formation** Although almost all adults endorse a religious identity for themselves, a recent study of 106 countries showed young adults are less likely to report affiliation with a religious identity or belief system than older adults, especially in North America, Europe, and predominantly Christian countries (Pew Research Center, 2018). In the United States, religiosity, particularly if measured by church attendance, declines from adolescence to young adulthood (Koenig et al., 2008).

However, despite declines, religiosity remains an important feature of life for many people. A survey of young adults across eight countries found that although many did not attend religious services or participate in structured religious activities, most emerging adults reported actively seeking a sense of meaning in religion and making attempts to live in accordance with religious principles (Benson et al., 2012). The inner lives of young adults—for example, frequent prayer and strong relational ties to faith—have a stronger influence on religious identity development than do external factors such as attending church regularly or going on missions (Smith et al., 2010). Moreover, emerging adults report a belief in God as being more important than necessarily following all of a formal religion's dictates (Smith & Snell, 2009).

**Sexual and Gender Identity Formation** Sexual identity can be defined as the cognitive and emotional underpinnings of people's understanding of and meaning ascribed to their sexuality (Savin-Williams, 2011). Generally, sexual-minority children first realize there is something different about them in childhood. In early adolescence, they often recognize they are attracted to, for example, others of the same sex, and by late adolescence, many have given themselves a label such as "gay" or "lesbian." In emerging adulthood, sexual identity becomes further solidified (Morgan, 2013).

This process is tied to cultural beliefs and attitudes about different sexualities. For example, the greater acceptance of diverse sexualities in recent decades has led to a downward shift in the age at which sexual identity is consolidated (Floyd & Bakeman, 2006; Halpern & Kaestle, 2014). For heterosexual adults, sexual identity often halts at a foreclosed identity status—meaning many young adults assume their sexuality is the norm and do not question or think deeply about it (Eliason, 1995).

It is often assumed that the primary identity crisis for transgender people involves a mismatch between psychological gender and biological sex and that identity achievement thus consists of changing the physical body such that gender and biology match and the person feels either fully male or fully female. However, many transgender people show shifts in their understanding of themselves over time and actively resist a binary gender classification (Diamond et al., 2011; Katz-Wise et al., 2017). Moreover, many transgender people must also weigh the social consequences of changing gender and consider the risks to their existing relationships with others, jobs, and safety (Levitt & Ippolito, 2014).

Transgender people have higher rates of depression, suicidality, self-harm, and eating disorders (Connolly et al., 2016), not as a direct consequence of being transgender but in response to societal pressures, rejection, stigma, and discrimination. Pride in a transgender identity, gender-affirming medical therapy, and support from family and friends are protective factors (Bockting, 2014; Connolly et al., 2016). Key features appear to be whether others use correct identity labels (many transgender people change their names once they transition) and the correct use of pronouns, in part because this is indicative of respect and support from others (Katz-Wise et al., 2017). The successful identification and resolution of transgender identity is associated with positive feelings about congruency, resilience and personal growth, enhanced empathy for others, and, when their identity is accepted by friends and family, improved and more authentic relationships (Riggle et al., 2011).



*Individuals go through identity processes not just for race/ethnicity, gender, sexual orientation, and religious identity but also for any other important dimension of the self. This might include identity processes focused on dimensions of identity such as political identity, disability status, and occupational identity.*

## checkpoint can you . . .

- Discuss identity status research on emerging adults in postindustrial societies?
- Explain why identity development of racial/ethnic minorities is complex?
- Discuss two other areas of identity development?

# Personality Development: Four Views

## normative-stage models

Theoretical models that describe psychosocial development in terms of a definite sequence of age-related changes.

## intimacy versus isolation

Erikson's sixth stage of psychosocial development, in which young adults either form strong, long-lasting bonds with friends and romantic partners or face a possible sense of isolation and self-absorption.

Most people with disabilities very much want intimate relationships but can experience barriers to their formation. For instance, caregivers—whether staff or family—may reprimand them for or forbid physical intimacy with others. Thus, disabled people are at higher risk for loneliness and isolation (English et al., 2018). More research is needed in this area.



What is personality? The answer depends in part on how we study and measure it. Four approaches to adult psychosocial development are represented by normative-stage models, the timing-of-events model, trait models, and typological models (Table 1).

## NORMATIVE-STAGE MODELS

At what age should people marry? Have children? Decide on a career? Every culture has norms about the “right” time for major life events to occur. **Normative-stage models** are theoretical approaches that hold that adults follow a basic sequence of age-related psychosocial changes. The changes are normative in that they are common for most members of a population at a particular time. However, what is normative is dependent upon the expectations about the timing of life events in that particular cultural group.

One normative-stage model is Erikson's psychosocial approach. The normative crisis of young adulthood is **intimacy versus isolation**. Recall that Erikson argued that successful resolution of a psychosocial crisis puts people in a good position to successfully address the next one. The psychosocial crisis in adolescence, according to Erikson, is identity formation. He believed that young people who develop a strong sense of self during adolescence are in a better position, in early adulthood, to fuse their identity with that of another. In other words, knowing who you are and what you want makes it more likely you will end up with a compatible partner who fulfills your needs.

Why is intimacy a trait to strive for? According to Erikson, this is important because if adults cannot make deep personal commitments to others, they risk becoming isolated and self-absorbed. Resolution of this stage results in the virtue of love: mutual devotion between partners who have chosen to share their lives and have children. Erikson believed that a failure to fulfill what he believed to be a natural procreative urge has negative consequences for development. Quite rightly, his theory has been criticized for excluding people who are single, celibate, childless, and/or members of the LGBTQ+ community.

Moreover, research has indicated that people of different genders may follow different developmental trajectories. For example, identity status achievement for men appears

**TABLE 1** Four Views of Personality Development

Models	Questions Asked	Methods Used	Change or Stability
Normative-stage models	Does personality change in typical ways at certain periods throughout the life course?	In-depth interviews, biographical materials	Normative personality changes having to do with personal goals, work, and relationships occur in stages.
Timing-of-events model	What if important life events occur earlier or later than usual?	Statistical studies, interviews, questionnaires	Nonnormative timing can cause stress and affect personality development.
Trait models	Do personality traits fall into groups or clusters? Do these clusters of traits change with age?	Personality inventories, questionnaires, factor analysis	Personality changes substantially until age 30, more slowly thereafter.
Typological models	Can basic personality types be identified, and how well do they predict the life course?	Interviews, clinical judgments, Q-sorts, behavior ratings, self-reports	Personality types tend to show continuity from childhood through adulthood, but certain events can change the life course.

to be related to initiation of relationships, whereas for women it is more strongly related to the stability of relationships (Kahn et al., 2014). Additionally, at least early in marriages, women tend to report higher intimacy than do men, which has implications for the health of the marriage later (Boden et al., 2010).

Last, the early work on normative life stages was based on small groups of men and women born in the 1920s, 1930s, and 1940s. Today, young adults follow much more diverse developmental paths and, as a result, may develop differently than did the people in these studies. In addition, the findings of normative-stage research may not apply to other cultures, some of which have very different patterns of life-course development.

Despite these critiques, normative-stage research has had an impact on the field. Psychologists, drawing on the work of Erikson, have identified developmental tasks that need to be accomplished for successful adaptation to each stage of life (Roisman et al., 2004). Among the typical developmental tasks of young adulthood are leaving the childhood home for advanced schooling, work, or military service; developing new and more intimate friendships and romantic relationships; and developing self-reliance and independence (Arnett, 2004; Scharf et al., 2004).

## TIMING-OF-EVENTS MODEL

Instead of looking at adult personality development purely as a function of age, the **timing-of-events model** (Neugarten et al., 1965; Neugarten & Neugarten, 1987) holds that the course of development depends on when certain events occur in people's lives. **Normative life events** (also called normative age-graded events) are those that typically happen at certain times of life—such events as marriage, parenthood, grandparenthood, and retirement. According to this model, people usually are keenly aware of both their timing and the **social clock**—their society's norms or expectations for the appropriate timing of life events.

If events occur on time, development proceeds smoothly. Stress may come from an unexpected event (such as losing a job), an event that happens off time (being widowed at age 35), or the failure of an expected and wanted event to occur at all (being unable to have a child). Personality differences influence the way people respond to life events and may even influence their timing. For example, a resilient person is likely to experience an easier transition to adulthood and the tasks and events that lie ahead than an overly anxious person.

The typical timing of events varies from culture to culture and from generation to generation. Indeed, more recent cohorts of young adults are completing the developmental tasks of this period at later ages than were previously normative, indicating that the timing of the social clock in US culture has shifted somewhat in recent years (Arnett, 2010). The rise in the average age when adults first marry in the United States (US Census Bureau, 2019) and the trend toward delayed first childbirth (Martin et al., 2021) are two examples of events for which timing has shifted. A timetable that seems right to people in one cohort or cultural group may not seem so to the next.

Since the mid-twentieth century, the social clocks in many Western societies have become more widely age-graded. Today people are more accepting of 40-year-old first-time parents and 40-year-old grandparents, 50-year-old retirees and 75-year-old workers, 60-year-olds in jeans and 30-year-old college presidents. This widened range of age norms undermines the predictability on which the timing-of-events model is based.

The timing-of-events model has made an important contribution to our understanding of adult personality by emphasizing the individual life course and challenging the idea of universal, age-related change. However, its usefulness may well be limited to cultures and historical periods in which norms of behavior are stable and widespread.



Young adults who have a strong sense of self are likely to be ready for the demands of an intimate relationship, according to Erikson.

David Lok/Purestock/SuperStock

### timing-of-events model

Theoretical model of personality development that describes adult psychosocial development as a response to the expected or unexpected occurrence and timing of important life events.

### normative life events

In the timing-of-events model, commonly expected life experiences that occur at customary times.

### social clock

Set of cultural norms or expectations for the times of life when certain important events, such as marriage, parenthood, entry into work, and retirement, should occur.

## TRAIT MODELS

When most people are asked to describe themselves, they often provide a list of adjectives. They might describe themselves as shy or outgoing, as friendly or neurotic, or as honest and hardworking. All of these descriptions focus on what psychologists call traits. **Trait models** are psychological models that focus on the measurement and examination of these different traits. One of the best known of these models is the **five-factor model** consisting of factors, or dimensions, that seem to underlie five groups of associated traits, known as the “Big Five” (see Figure 1).

The Big Five factors appear to be linked to various aspects of health and well-being. Big Five traits have been associated with marital satisfaction (Gattis et al., 2004), parent-infant relationships (Kochanska et al., 2004), work-family conflict (Wayne et al., 2004), and personality disorders. With respect to specific factors, openness to experience has been related to verbal intelligence and creative achievement (DeYoung et al., 2014; Kaufman et al., 2016) as well as better health (Strickhouser et al., 2017). Conscientiousness has been linked most strongly with health-related behaviors that contribute to long life (Bogg & Roberts, 2013; Strickhouser et al., 2017). People low in extraversion are prone to agoraphobia (fear of open spaces) and social phobias (Bienvenu et al., 2001), while those high in extraversion tend to be high in well-being (Soto, 2015) but are more likely to engage in more substance use (Atherton et al., 2014). Agreeableness has been associated with less negative responses to stress; however, it also appears associated to greater declines in positive affect following a stressor (Leger et al., 2016). Last, people high in neuroticism tend to be subject to anxiety and depression (Bienvenu et al., 2001) and are more likely to be dependent on drugs and low in well-being (Valero et al., 2014; Soto, 2015).

*Fake news—often spread virally on social media—has become a major issue. Why do people share misinformation and conspiracy theories? One factor that has been identified is political ideology. Overall, conservative people are more likely to share fake news than those who are more liberal. However, personality is important too. When people are low in conscientiousness, both liberals and conservatives are equally likely to share misinformation (Asher & Kakkar, 2021).*



**Continuity and Change in the Big Five** Do people change or stay the same? Overall, average personality changes are small (Cobb-Clark & Schurer, 2012). Analyses of longitudinal and cross-section data in US adults have found considerable continuity within people (Costa & McCrae, 2006; McCrae, 2002; McCrae et al., 1986).

The observation that people’s personalities, on average, remain similar does not mean no change occurs (Roberts & Mroczek, 2008). There is normative developmental change in all five dimensions between adolescence and age 30, with much slower change thereafter. Change is almost exclusively in a positive direction, with increases in social dominance (assertiveness, a facet of extraversion), conscientiousness, emotional stability, and agreeableness and decreases in neuroticism, extraversion, and openness to experience (Soto et al., 2011; McCrae et al., 2000; Specht et al., 2011; Borghuis et al., 2017).

When personality change does occur, it may be influenced by life experiences. While onetime events appear to have little influence on personality change, increasing evidence suggests long-term stressors such as chronic health problems do appear to exert an influence (Elkins et al., 2017). Positive events matter too; people with successful, satisfying careers in young adulthood tend to show disproportionate increases in emotional stabil-



**FIGURE 1**

### The Big Five Factors of Personality

*Each factor, or dimension, of personality represents a cluster of related traits. Use the acronym OCEAN to remember the Big Five: openness, conscientiousness, extraversion, agreeableness, and neuroticism.*

ity and conscientiousness over time (Roberts & Mroczek, 2008). Moreover, getting married, divorced, or having a baby can also affect levels of the Big Five traits (Specht et al., 2011). Last, heritability estimates for personality decline with age, suggesting increasingly important environmental influences (Briley & Tucker-Drob, 2017).

It is important to remember that while life events affect personality, personality also affects the probability of particular events occurring. Moreover, effects are interactive. For example, adolescents who are sociable and affable tend to rise faster in their early careers; in turn, those who are in higher-status, more satisfying jobs tend to become more sociable and affable over time (Roberts et al., 2003).

## TYPOLOGICAL MODELS

Jack Block (1971; Block & Block, 2006) was a pioneer in the **typological approach**. Typological research seeks to complement and expand trait research by looking at personality as a functioning whole.

Researchers have identified three personality types: ego-resilient, overcontrolled, and undercontrolled. These three types differ in **ego resiliency**, or adaptability under stress, and **ego control**, or self-control. Ego-resilient people are well-adjusted: self-confident, independent, articulate, attentive, helpful, cooperative, and task-focused. Overcontrolled people are shy, quiet, anxious, and dependable; they tend to keep their thoughts to themselves and to withdraw from conflict, and they are the most subject to depression. Undercontrolled people are active, energetic, impulsive, stubborn, and easily distracted. These or similar personality types seem to exist in both sexes, across cultures and ethnic groups, and in children, adolescents, and adults (Caspi, 1998; Hart et al., 1997; Pulkkinen, 1996; Robins et al., 1996; van Lieshout et al., 1995).

Ego resiliency interacts with ego control to determine whether or not behavior is adaptive or maladaptive. For example, undercontrol can lead to creativity and resourcefulness or, if it is excessive, to externalizing and antisocial behaviors. By the same token, overcontrol can help make a person highly focused and planful, or it can lead to an inflexible and inhibited style of behavior.

Many of the positive effects of ego resilience are likely due to its association with positive emotions and self-efficacy beliefs, which are themselves associated with positive outcomes. For example, ego resiliency has been associated with self-efficacy beliefs and the expression of positive emotions during adolescence and early adulthood (Alessandri et al., 2016). In turn, positive emotions have been found to be predictive of ego resiliency (Vulpe & Dafinoiu, 2012; Milioni et al., 2016). Additionally, ego resiliency has been associated with perceptions of support from both family and friends (Alessandri et al., 2016; Taylor et al., 2014) and is predicted by effortful control (Alessandri et al., 2014).

Which of the models presented here seems to you to most accurately describe psychosocial development in adulthood?



The Big Five factors are related to what type of vacation you might most enjoy. Extraverts enjoy being social and communicating, so are more likely to enjoy places where they speak the local language. People high on openness to experience are willing and eager to accept change and novelty, and thus prefer places with cultures distinct from their own (Westgate, 2021), whereas those low on openness to experience might prefer the familiarity of lying on a sunny beach (Dani, 2014). People high on neuroticism, who are more anxious and fearful, prefer locations visited previously by others, such as crowded tourist sites (Kahle et al., 2005).

### typological approach

Theoretical approach that identifies broad personality types, or styles.

### checkpoint can you ...

- ▶ Compare four theoretical approaches to adult psychosocial development?

#### ego resiliency

(1) Dynamic capacity to modify one's level of ego-control in response to environmental and contextual influences. (2) The ability to adapt flexibly and resourcefully to potential sources of stress.

#### ego control

Self-control and the self-regulation of impulses.

# Relationships in Emerging Adulthood

Erikson saw the development of intimate relationships as the crucial task of young adulthood. The need to form strong, stable, close, caring relationships is a powerful motivator of human behavior, and indeed, strong relationships with parents, peers, and others are associated with good social and emotional functioning (Holt et al., 2018).

People with larger and better connected amygdalae—a part of the brain involved in emotions—tend to have larger social circles (Bickart et al., 2014).





*Although emerging adults may no longer rely on parents for basic sustenance, they still benefit from parental companionship and social support.*

Jupiterimages/Thinkstock/Alamy Stock Photo

## RELATIONSHIPS WITH PARENTS

Even though they are no longer children, emerging adults still need parental acceptance, empathy, and support, and attachment to the parents remains a key ingredient of well-being (Lindell & Campione-Barr, 2017). Positive parent-child relationships during early adolescence predict warmer and less conflicted relationships with both parents when the children reach age 26 (Belsky et al., 2001). Moreover, when emerging adults have parents who are closely involved, warm, and loving, they have higher levels of self-worth (Nelson, et al., 2015). Additionally, emerging adults who report high relationship satisfaction with their parents are less likely to become depressed and report higher life satisfaction (Chopik et al., 2021).

However, a balance must be struck between supporting young adults' emerging autonomy without at the same time undermining their growing independence. Too much involvement is unhealthy, but so is too little. For example, indulgent parenting in adolescence and helicopter parenting in emerging adulthood are associated with emerging adults' depression and anxiety symptoms (Cui et al., 2019). However, at the same time, poor communication in adolescence with their same-sex parent is also associated with depressive symptoms in emerging adulthood (Finan et al., 2018), and those young adults who report less satisfying relationships with their parents are more likely to report depression symptoms (Chopik et al., 2021).

Generally, parents and young adult children get along best when the young adult is following a normative life course and has deferred the responsibility of parenthood until other adult roles are well established (Belsky et al., 2003). Financial support from parents, especially for education, enhances emerging adults' chances of success in adult roles (Aquino, 2006).

Parents of disruptive or conflictual young adults may experience increased distress as a result of their child's actions (McClelland & McKinley, 2016), particularly given the shifting balance of power as young adults become more independent and are less subject to parental control.

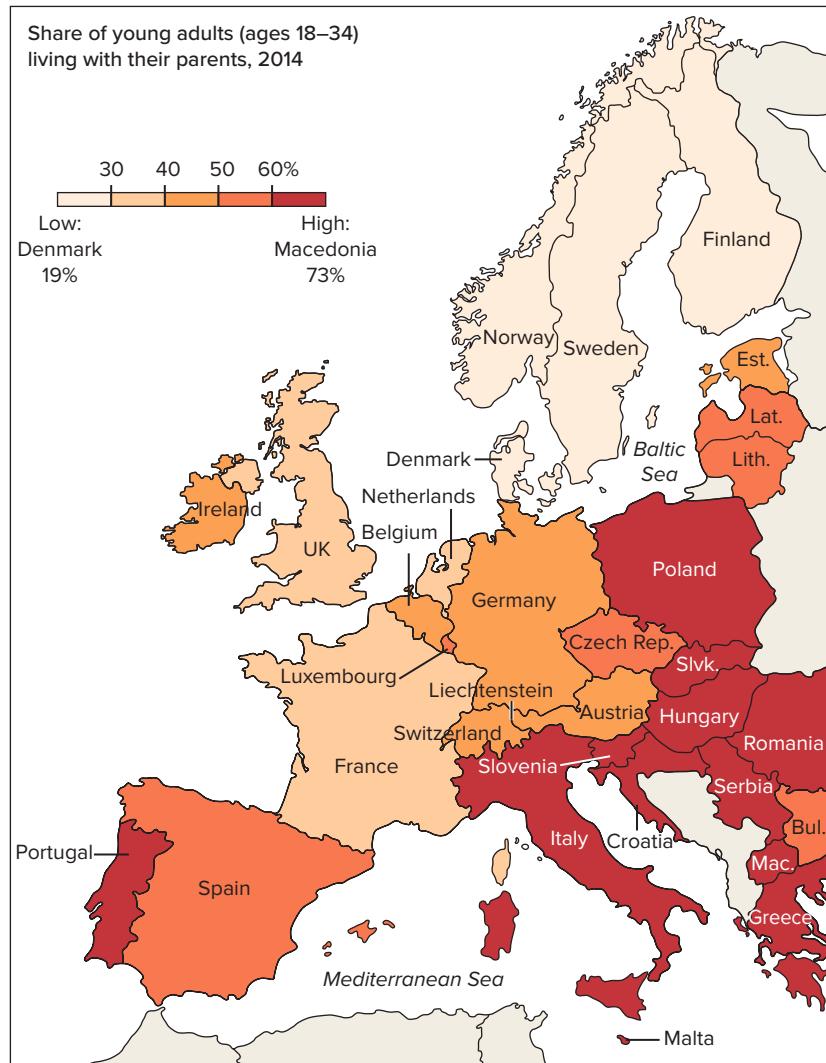
**Failure to Launch** Economic and social changes in the United States—including automation, globalization, and technological change—have made it more difficult for young adults to establish an economically viable independent household. In 2021, more than half of (58 percent) of 18- to 24-year-olds and 17 percent of 25- to 34-year-olds lived with their parents (US Census Bureau, 2019). Although staying in the family home can afford the opportunity to continue to work on occupational advancement, it also can result in threats to autonomy and independence (Burn & Szoek, 2016). For example, young adults who are less likely to receive parental assistance, including African Americans, Hispanics, and those with household incomes less than \$50,000 a year, believe financial independence should begin at ages 16 to 18 years (Country Financial Security Index, 2018).

In contrast to high-income cultures, middle- and low- cultures tend not to view the establishment of a separate household, either before or after marriage, as an essential step on the path to adulthood (Arnett, 2015). Despite this, the trend for increasing numbers of emerging adults to live in the parents' home for economic reasons also exists in other countries. Young adults from the ages of 18 to 24 years are the most likely to suffer the effects of an economic recession (Aasve et al., 2013). Across much of Europe, as well as in Hong Kong, the global financial crisis, weak employment and wages, and high housing costs led to an increase in the proportion of emerging adults remaining in the parental home (Lennartz et al., 2016; Victor, 2015; see Figure 2). Economic projections suggest this trend will continue (Seiffge-Krenke, 2016), and the projected continuing negative influence of the COVID-19 pandemic on the global economy (Jackson et al., 2020) suggests it may accelerate.

### checkpoint can you ...

- Explain how relationships with parents affect adjustment to adulthood and how emerging adults renegotiate their relationships with their parents?
- Discuss the trend of young adults living in the parental home?

**Many young Europeans live with their parents, especially in southern and eastern Europe.**



**FIGURE 2**

Share of European Young Adults (18–34 Years) Living with Their Parents, 2014

*For the first time in the modern era, living with parents edges out other living arrangements for 18- to 34-year-olds.*

Source: DeSilver (2016).

## FRIENDSHIP

Young adults generally have the largest friendship networks; however, friendships during this time are often less stable than in either adolescence or later adulthood, primarily because people in emerging adulthood relocate more frequently (Wrzus et al., 2015; Collins & Van Dulmen, 2006). Nonetheless, many young adults manage to maintain high-quality, committed, long-distance friendships (Johnson et al., 2009), sometimes using social networking sites to keep in touch across geographical distance (Subrahmanyam et al., 2008). But regardless of whether the friendships are virtual or not, they tend to center on work and parenting activities, sharing confidences, and advice.

Over the course of young adulthood, the number of friends and the amount of time spent with them gradually decrease as leisure time decreases and responsibility to others increases. For example, having a child is associated with a sharp decrease in the size of the friendship network (Wrzus et al., 2013). Still, friends remain important. Adults who report receiving support from friends are less likely to have depressive symptoms (Finan et al., 2018) and have a higher sense of well-being—although it is unclear if friendship causes well-being or if people who feel good about themselves have an easier time making friends (Myers, 2000).



*During the COVID-19 pandemic, many interactions moved online for safety. However, research suggests that although spending time with friends in person is associated with an increase in positive affect and a decrease in negative affect, interactions over Zoom do not have the same effect (Kesselring et al., 2021).*



*Intimate relationships involve self-awareness, empathy, and the ability to communicate. Such skills are pivotal as young adults decide whether to marry or form partnerships.*

Creatas Images/Getty Images

#### fictive kin

Friends who are considered and behave like family members.

#### triangular theory of love

Sternberg's theory that patterns of love hinge on the balance among three elements: intimacy, passion, and commitment.

*Do you like love stories? What about tearjerkers? Well, such movies may have an unintended effect. Women's tears have been shown to lead to lower levels of sexual arousal in men. Researchers believe that close contact sends an olfactory chemical message to the man's brain, and the message the tears are sending is "back off" (Gelstein et al., 2011).*



Women typically have more intimate friendships than men do (Hall, 2011). Women are more likely to share confidences with friends (Rosenbluth & Steil, 1995), to talk with their friends about marital problems, and to receive advice and support (Helms et al., 2003). Men, by contrast, are more likely to share information and activities (Rosenbluth & Steil, 1995). However, when men do share intimate details, as with women, this results in increased closeness (Bowman, 2009).

Close, supportive friendships are sometimes incorporated into family networks. These types of friends are known as **fictive kin**—they are treated as family members despite a lack of blood relationship. For example, fictive kinship relationships often develop for gay and lesbian people who have straight friends of the opposite sex, particularly if those friends are unmarried or have an unconventional lifestyle (Muraco, 2006). Single adults without children are also more likely to develop stronger fictive kin relationships than are married adults with families (Casper et al., 2016). Generally, high-quality bonds with nonkin are associated with increases in happiness for both single and dating emerging adults (Demir et al., 2018).

In recent years, young adults' use of social networking sites has increased dramatically. Currently, 90 percent of adults age 18 to 29 years use social media, with broad similarities in usage patterns between racial and ethnic groups and gender (Perrin, 2015). Studies have found the use of social media is associated with negative effects on well-being, depression, and body image (Kross et al., 2013; Primack et al., 2017; Holland & Tiggemann, 2016), and the more sites used, the greater the degree of anxiety, depression, alcohol, and drug use reported by young adults (Vanuccci et al., 2019). However, social networking sites can also have advantages. For example, recent research indicates that social networking sites

are often used to maintain and strengthen ties to others (Hampton et al., 2011; Subrahmanyam et al., 2008; Manago et al., 2012), and they are related to increased participation in political discussion and activities (Boulianne, 2015; Skoric et al., 2016). They have also been associated with increases in perceived social support, decreases in stress and loneliness, and better health outcomes (Nabi et al., 2013; Deters & Mehl, 2013; Korda & Itani, 2013).

Why people use social networking sites may help determine their effects. Some people use electronic communication as a means by which to augment and extend their interactions with others. However, other people use electronic communication as a means by which to avoid social interactions. In these cases, social media may be displacing face-to-face interactions and have negative effects on well-being (Ahn & Shin, 2013).

## LOVE

Relationships are important; young adults who are in romantic relationships report being happier, more satisfied with their lives, show less mental and physical illness, and have higher self-esteem (Gómez-López et al., 2019; Research in Action).

According to **Sternberg's triangular theory of love** (1995), the three elements, or components, of love are intimacy, passion, and commitment. **Intimacy**, the emotional element, involves self-disclosure, which leads to connection, warmth, and trust. For example, new lovers might share stories of their childhood or their hopes for the future. **Passion**, the motivational element, is based on inner drives that translate physiological arousal into sexual desire. Passion might include feelings of sexual attraction, intrusive thoughts of the romantic partner, or sexual activity itself. **Commitment**, the cognitive element, is the decision to love and to stay with the beloved. So, for example, commitment might include a decision to make the relationship exclusive or to marry. The degree to which each of the three elements is present determines what type of love people feel (Table 2).

## INTERRACIAL DATING

One Thanksgiving, Jess brought home her new boyfriend, Nate, to join the family for a holiday dinner. Initially, her family was shocked to see Jess was seriously dating a man who was not Asian as they were but Black. This type of situation—famously portrayed in the classic 1967 film *Guess Who's Coming to Dinner*—has been repeated in the homes of a growing number of families. As many parents do, after the initial shock, the family embraced Nate and accepted his relationship with their daughter. Jess and Nate's story is common: As of 2015, 24 percent of Black men and 36 percent of Asian women married in the United States have married someone of a different race (Livingston & Brown, 2017).

In 1967, the US Supreme Court decision in *Loving v. Virginia* legalized interracial dating, and such marriages are on the rise (Gillmer, 2017). Interracial and interethnic marriages increased from 7.4 percent to 10.2 percent from 2000 to 2010 (Johnson & Kredier, 2013), rising again to 17 percent by 2015 (Livingston & Brown, 2017).

As people begin to emerge as adults, many explore the possibilities of dating outside of their race (Ranzini & Rosenbaum, 2020). One factor making it easier for people to date individuals of other races is the increased availability of mobile dating applications. Thirty-eight percent of US adults have used some form of online dating service (Gatter & Hodkinson, 2016). In particular, evidence shows that Tinder, because of its

use of pictures and names, focuses more on nonverbal communicative cues rather than written responses and descriptions. In line with other research, White individuals are perceived to be more attractive than those in other racial groups but interestingly in this case, not by members of their own race (Ranzini & Rosenbaum, 2020). This suggest that BIPOC people who are interested in dating outside of their race tend to desire White profiles more than others, whereas White people show no clear desire to date within their own race.

Although stigma and prejudice are still prevalent, those negatives do not seem to keep people from dating and marrying people outside of their race. Even religious-cultural divides appear to not be as hindering as most people thought (Brym & Lenton, 2020). People are venturing beyond racial barriers to form intimate relationships, and indeed interracial relationships are on a path to becoming more common than same-race relationships.



Do you see interracial relationships around you? Have you ever thought of dating someone outside of your race and, if so, why?

**TABLE 2** Patterns of Loving

Type	Description
<b>Nonlove</b>	All three components of love—intimacy, passion, and commitment—are absent. This describes most interpersonal relationships, which are simply casual interactions.
<b>Liking</b>	Intimacy is the only component present. There is closeness, understanding, emotional support, affection, bondedness, and warmth. Neither passion nor commitment is present.
<b>Infatuation</b>	Passion is the only component present. This is “love at first sight,” a strong physical attraction and sexual arousal, without intimacy or commitment.
<b>Empty love</b>	Commitment is the only component present. Empty love is often found in long-term relationships that have lost both intimacy and passion or in arranged marriages.
<b>Romantic love</b>	Intimacy and passion are both present. Romantic lovers are drawn to each other physically and bonded emotionally. They are not, however, committed to each other.
<b>Companionate love</b>	Intimacy and commitment are both present. This is a long-term, committed friendship, often occurring in marriages in which physical attraction has died down but in which the partners feel close to each other and have made the decision to stay together.
<b>Fatuous love</b>	Passion and commitment are present without intimacy. This often leads to a whirlwind courtship in which a couple make a commitment without allowing themselves the time to develop intimacy. This kind of love usually does not last.
<b>Consummate love</b>	All three components are present in this “complete” love. It is easier to achieve than to hold onto.

Source: Based on Sternberg (1986).

## checkpoint can you... List skills that promote and maintain intimacy? Identify characteristic features of friendship in young adulthood? Identify the three components of love, according to Sternberg?

- ▶ List skills that promote and maintain intimacy?
- ▶ Identify characteristic features of friendship in young adulthood?
- ▶ Identify the three components of love, according to Sternberg?

As adolescents move into adulthood, they tend to feel an increasing amount of intimacy, passion, and commitment in their romantic relationships (Sumter et al., 2013). Romantic love, dominated by passion, does not appear to be a Western invention. An anthropological survey of 166 cultures found evidence of romantic love in 88.5 percent of the accounts, suggesting that romantic love is a near-universal (Jankowiak & Fischer, 1992).

Although they are more alike than different, men and women show modest differences in intimacy, passion, and commitment within their romantic relationships. Generally, women report greater intimacy in their relationships, whereas men report greater passion. Levels of commitment, however, appear to be similar in both genders (Sumter et al., 2013). The length of the relationship affects the dynamics of the relationship. **Generally, passion is higher at the beginning of the relationship and declines over time as commitment increases** (Ahmetoglu et al., 2010).

# Marital and Nonmarital Lifestyles

More and more, people are using online sites to meet potential dates and romantic partners. But can we trust what people say? For the most part, it seems we can, but people do tend to lie about (in order) weight, age, and height (Toma et al., 2008).



Venus Williams is just one of many women who remain single through young adulthood.

Cameron Spencer/Getty Images

In many Western countries, today's rules for socially acceptable lifestyles are more flexible than they were during the twentieth century. People marry later, if at all; more people have children outside of marriage, if at all; and more people end their marriages. Some people remain single, some remarry, and others live with a partner of either sex. In this section, we look more closely at marital and nonmarital lifestyles. In the next section, we examine parenthood.

## SINGLE LIFE

Across Europe and North America, many single adults are postponing marriage and children (Geist, 2017). Globally, approximately 12.5 percent of households consist of a single adult, with the highest rates (27.1 percent) found in high income areas of Europe and North America (UN Women, 2019).

In the United States, the proportion of young adults age 18 to 34 who have not yet married has similarly increased over the past decades, from 41 percent in 1978 to 71 percent in 2018 (US Census Bureau, 2018). In 1960, the age at first marriage was 20 years for women and 23 years for men. In 2021, this number rose to 28.6 years for women and 30.4 years for men (US Census Bureau, 2021). This decline in marriage has occurred across all age groups but is most prominent in young adults (Cohn et al., 2011) and among African Americans (Fry & Parker, 2021; Wang & Parker, 2014).

About half of single adults in the United States are happy being alone; they are not searching for a partner (Brown, 2020). Some young adults stay single because they have not found the right mate; others are single by choice. At the same time, many single adults are postponing marriage and children due to economic instability (Cohn, 2018), a desire to coordinate career goals with long-term relationship goals (Shulman & Connolly, 2013), or out of a desire for self-fulfillment. Unfortunately, there are consequences to singlehood. Unpartnered adults do not fare as well as married couples. They make less money, are less likely to have a job, have lower educational attainment, and are more likely to live with parents (Fry & Parker, 2021).

Despite being single, many adults enjoy sexual and intimate relationships with others. Since the 1960s, Americans have become more likely to have more sexual partners and casual sex, and are more accepting of premarital sex (Twenge et al., 2015). One pattern that has become increasingly common in single adults is that of "friends with benefits" (FWB), relationships in which there is a blend of friendship and physical intimacy but little commitment. Men are more likely to seek FWB out of a desire for sexual activity, whereas women are more likely to express a desire for an emotional connection and for the relationship to eventually progress to a committed romantic relationship (Lehmiller et

al., 2011; Gusharova et al., 2012). Given these different motivations, it is perhaps not surprising that women report greater levels of deception in FWB relationships (Quirk et al., 2014). Despite this, both men and women generally report positive emotions about their FWB relationships, although men are more likely to do so (Owen & Fincham, 2011).

## NONHETEROSEXUAL RELATIONSHIPS

Forty-five years ago, same-sex couples were not legally recognized in any country (Saez, 2011). However, shifting attitudes have led to great changes. Currently, 31 countries and territories have legalized same-sex marriage (Human Rights Campaign, 2022). Most countries are in Western Europe and the Americas, where acceptance of homosexuality and other variations is high (Poushter & Kent, 2020).

However, much discrimination still exists. Countries in Eastern Europe, the Middle East, and sub-Saharan Africa as well as Russia and Ukraine tend to be less tolerant of homosexuality (Poushter & Kent, 2020). For example, in Russia, it is a crime to distribute “propaganda of nontraditional sexual relationships among minors.” Same-sex relations between men are banned in some areas of Indonesia, Malaysia, Myanmar, and much of the African continent, and in Brunei, Mauritania, Sudan, and parts of Nigeria, sexual acts between same-sex people are punishable by death (Council on Foreign Relations, 2017).

Overall, acceptance of alternative sexualities has increased in the last four decades. For example, when asked if homosexuality should be accepted by society, 54 percent of South Africans responded affirmatively, a 21-point increase from when similar data was collected 20 years ago (Poushter & Kent, 2020). However, at the same time, polarization has increased. The trend toward increased acceptance was driven by countries that were already accepting and that then became more so. However, countries that were not accepting of alternative sexualities, such as Ethiopia, Azerbaijan, Senegal, Tajikistan, and Somaliland, showed decreases in their level of acceptance (Flores, 2019). Generally, countries with greater wealth and more developed economies tend to show more acceptance of homosexuality (Poushter & Kent, 2020).

In the United States, greater social acceptance of alternative sexualities has led to more gay and lesbian adults coming out and living openly. Approximately 87 percent of Americans know someone who is gay or lesbian, and about half report a close family member or friend is gay or lesbian, although only 30 percent know someone who is transgender (Cooperman et al., 2016). It may be that the increasing openness with which sexual and gender identity minorities are living their lives is affecting public opinion. Those who are close to a gay or lesbian person are more likely to be supportive of gay marriage and antidiscrimination laws (Neidorf & Morin, 2011), and a current high of 70 percent of Americans now support gay marriage (McCarthy, 2021).

In 2019, approximately 75 percent of Democrats supported same-sex marriage. By contrast, only 44 percent of Republicans supported it. Religion also plays a role. Of those people who characterize themselves as unaffiliated with any religion, 79 percent support gay marriage. Although religiously affiliated people are less likely to endorse gay marriage, the number that are in favor of it has also increased. For example, in 2004, approximately 11 percent of White evangelical Christians were in favor of gay marriage. In 2017, that number rose to 29 percent. In addition, age has been implicated in the debate, with younger generations becoming increasingly accepting of same-sex marriage (Pew Research Center, 2019).

In the United States, gays and lesbians struggled for decades to obtain legal recognition of their unions, arguing that same-sex marriage offered benefits that civil unions did not. Research supported their assertion: Gay and lesbian people in those states that had legalized gay marriage and who were thus able to marry showed lower levels of depression, stress, and internalized homophobia, and they felt they had more meaning in their lives (Riggle et al., 2010). On June 26, 2015, the US Supreme Court legalized gay marriage, ruling that bans on same-sex marriage were unconstitutional. Prior to the Supreme Court decision, approximately 8 percent of gay, lesbian, bisexual, or transgender people



*Gay and lesbian couples without children are more likely than either gay or lesbian people who are single or gay and lesbian couples with children to have pets (Gabb, 2019).*

were married to a same-sex partner. Currently, approximately 58 percent of same-sex couples in the United States are married, with lesbians somewhat more likely to marry than gay men (Walker & Taylor, 2021).

In most ways, gay and lesbian relationships mirror heterosexual relationships. Gay and lesbian couples tend to be at least as satisfied with their relationships as heterosexual couples (Farr et al., 2010). The factors that predict the quality of both homosexual and heterosexual relationships—personality traits, perceptions of the relationship by the partners, ways of communicating and resolving conflicts, and social support—are similar (Kurdek, 2005, 2006). Indeed, committed same-sex relationships are hardly distinguishable in quality from committed heterosexual relationships (Roisman et al., 2008). Just as with heterosexual relationships, support from family and friends is related to how well and how long the relationship lasts (Kurdek, 2008). Likewise, variables related to breakups are similar and include poor relationship quality and infidelity (Balsam et al., 2017).

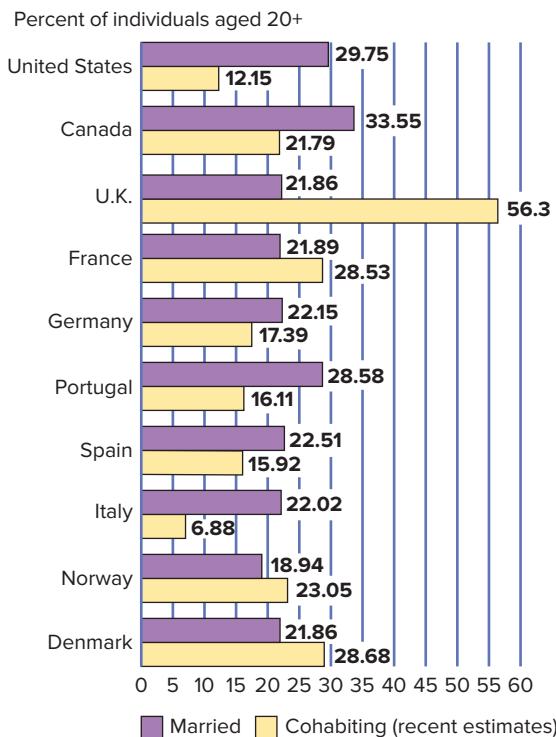
Differences between gay and lesbian couples and heterosexual couples have also emerged from research. First, gay and lesbian couples are more likely than heterosexual couples to negotiate household chores on a more egalitarian basis. Second, they tend to resolve conflicts in a more positive atmosphere than heterosexual couples do. Third, gay and lesbian relationships tend to be less stable than heterosexual relationships, perhaps due to the lack of institutional supports (Pope et al., 2010). With respect to relationship dissolution, lesbian couples are more likely to divorce than gay couples (Balsam et al., 2017).

## COHABITATION

Cohabitation is an increasingly common lifestyle in which an unmarried couple involved in a sexual relationship live together. The prevalence of cohabitation varies widely across countries (see Figure 3). For example, within the Americas, rates are relatively low in Mexico and the United States, and higher in Central America, the Caribbean, and Amazonian areas (Lopez-Gay et al., 2014). Across democratic countries with market economies and high economic development, approximately 10 percent of partnered young adults are living with an unmarried partner. However, there are wide variations in rates. For example, approximately 20 percent of adults over 20 years old in Sweden cohabit, but in Poland and Greece, only about 2 percent do (Organisation for Economic Co-operation and Development, 2016). Cohabitation is also more rare in East Asia, Japan, and South Korea (United Nations, 2011; Lesthaeghe, 2010; Raymo et al., 2015).

In many countries, cohabitation is viewed as an alternative to marriage and not, as is often found in the United States, a stepping stone on the road to matrimony. Cohabitation may also be viewed as a compatibility test for potential marriage partners or as providing an easy escape route in the event a relationship sours (Hiekel & Keizer, 2015; Mynarska et al., 2014). There is some evidence that attitudes regarding cohabitation are changing, with younger adults across a variety of countries showing greater acceptance for cohabitation and other marital alternatives (Treas et al., 2014). For example, in many countries, including China, Spain, and Canada, more recent cohorts are cohabitating at higher rates than older adults (Yu & Xie, 2015; Dominguez-Folgueras & Castro-Martin, 2013; Le Bourdais & Lapierre-Adamcyk, 2004).

In 2021, approximately 8 percent of American adults were living with an unmarried partner. As in other countries, cohabitation rates are higher in younger adults with 17 percent—roughly double the overall adult rate—of men and women aged 25 to 34 years reporting living with an unmarried partner (US Census Bureau, 2021). While the cohabitation numbers dipped slightly in 2016, perhaps due to the increased availability of marriage for gay and lesbian couples (US Census Bureau, 2016), cohabitation is now more common in adults age 18 to 24 years than



**FIGURE 3**

Marriage and Cohabitation Rates of Individuals Aged 20-34 Years by Country

Source: Organisation for Economic Co-operation and Development (2016).

marriage. The overall increase in cohabitation in the United States has occurred among all racial/ethnic groups and at all educational levels, but couples who cohabit, on average, are still more likely to be younger and less religious, to be African-American, and to have less education (Manning, 2013; Gurrentz, 2018; Horowitz et al., 2019). Cohabitors also are likely to be less traditional, less confident in their relationships, more accepting of divorce, more negative and aggressive in their interactions with their romantic partners, and less effective communicators (Jose et al., 2010). Another important variable has to do with economics. As men—the traditional breadwinners for the family—experienced wage stagnation and became less able to independently support a family, they became less attractive as a marriage partner. Additionally, women's entry into the workforce gave them more financial independence and presumably led to a decreased motivation on their part to enter into marriage (Dew, 2021; Sassler & Lichter, 2020).

Cohabiting relationships tend to be less satisfying and less stable than marriages. Cohabitating couples report lower levels of relationship satisfaction and less trust in their partners, and are less likely to stay together than married couples (Graf, 2019; Lau, 2012). Generally, the lowest relationship quality is reported by cohabitants without plans to marry or in relationships in which one partner wishes to marry and the other does not (Brown et al., 2017; Willoughby & Belt, 2016). However, both married couples and cohabiting couples who plan to marry report higher relationship satisfaction in comparison to cohabiting couples who do not plan to marry (Tai et al., 2014). This suggests there may be fundamental differences in types of cohabiting couples, with those couples who eventually marry having more stable and happier relationships than those who do not (Jose et al., 2010). These young adults are not using cohabitation to replace marriage but view it as one step along the way to marriage (Graf, 2019). Another common stressor involves divergent expectations about the division of household labor; cohabitating couples in this situation are highly likely to break up (Hohmann-Marriott, 2006).

Although US family law currently gives cohabitators few of the legal rights and benefits of marriage, the argument has been made that this situation should change in order to provide relationship partners as well as any resulting children legal protection in the event of relationship dissolution (Waggoner, 2016). Other countries, including the United Kingdom, Australia, Canada, and New Zealand, have enacted legislation giving committed cohabitating couples rights similar to those of married couples (Waggoner, 2015).



*In the United States, cohabitating couples were more likely to have jobs in 2020 than were opposite-sex married couples (Washington, 2021).*

## checkpoint can you ...

- State reasons why people remain single?
- Compare gay and lesbian relationships with heterosexual relationships?



*American adults are more likely to marry someone of a different race, ethnicity, or religion than they are to marry someone from a different political party (Geiger & Livingston, 2019).*

## MARRIAGE

All cultures have some means by which people marry and form permanent partnerships. The transition to married life brings major changes in sexual functioning, living arrangements, rights and responsibilities, attachments, and loyalties.

**Cultural and Contextual Influences on Marriage** Marriage customs vary widely across cultures (see Window on the World). The largest differences are found between lower- and higher-income countries. In general, marriage rates are higher in lower-income countries, especially in Asia or the Middle East. Moreover, in lower-income countries, cultural norms for gender roles are stronger and have more of an effect on spousal interactions (Anukriti & Dasgupta, 2017).

Marriage is sometimes linked to economic transactions. In some cultures, primarily those concentrated in Africa and Asia, marriage is associated with either a bride price or a dowry. A bride price is a payment made by a groom or his family to the bride's family. A dowry is a payment by a bride's family to the newly married couple or to the groom's family (Conteh, 2016). More rarely, a bride service is a service provided to the family of a bride in exchange for the marriage (Dean, 2018).

If a girl marries and a bride price is paid to her family, the family has one fewer member to support and simultaneously receives a financial boon. This may be why marriage in cultures in which a bride price is paid tends to happen, for girls, at earlier ages (Corno & Voeva, 2016). By contrast, if a young woman's parents must pay a dowry to find her a husband, she becomes an economic burden. Thus, in cultures such as these,



## POPULAR WEDDING TRADITIONS ACROSS CULTURES

Most cultures have long-standing wedding traditions. Often these traditions were designed to ward off evil spirits and bring luck and good fortune to the new couple. Special clothing, symbolic elements, and traditional rites are usually part of the ceremony.

Brides wear white in much of Europe and America. Wearing white is symbolic of the purity and virginity of the bride. This tradition began when Queen Victoria wore a white gown to her wedding in 1840. Before this, white was worn as a symbol of mourning, and red was the most popular color to be married in (Smithsonian, 2014). In China, brides still wear red, which is considered to be a symbol of good luck and good fortune.

One of the most common traditions is to throw rice, oats, wheat, beans, peas, or other seeds at the new couple as they exit the ceremony. It symbolizes new life, fertility, and prosperity for the couple. Other things are used today such as birdseed, confetti, or bubbles. This tradition has been seen in Greece, France, Germany, Czechoslovakia, Spain, Italy, the United States, and numerous other countries (Monger, 2013). Flowers, too, are common and were used by brides in the middle ages as a tribute to the bride's virtue (Lacey, 1969).

The wedding veil is also a common tradition, used by, for example, Christian, Moslem, Jewish, and Hindi brides. Its ancient purpose is to ward off evil spirits by hiding the bride, as well as symbolize the bride's purity (Chessier, 1980). The tradition was also used in arranged marriages in Middle Eastern cultures to hide the bride from her new husband until after the ceremony so he could not change his mind if he did not

like what he saw (Monger, 2013). Generally, veils are white; however, Roman brides wore a red veil as it was believed to be more effective in warding off evil spirits (Chessier, 1980). Variations of this tradition include traditional Chinese brides wearing a full red veil to hide their face from evil spirits and encourage fertility and prosperity for the new couple (Bingyao, 2017).

In the American antebellum South, Black couples would jump over a broom together as a symbol of the joining of two families and the couple starting their new life together. This ritual has become a popular part of many African American couples' weddings, in part as a means of showing respect for ancestors (Dundes, 1996).

A wedding reception or party is also common across most cultures. Depending on religion, status, and custom, these can include speeches, a toast, dancing, and traditional wedding foods. This is a time for friends and family to celebrate with the new couple. Length and formality of the reception can vary. For example, in India, the celebration will go on for several days, whereas in Russia, the reception lasts 2 hours (Monger, 2013).



Have you thought about getting married and the traditions that you might follow one day? Where do you think these traditions come from, and what is their meaning?



Couples in arranged marriages report being equally happy as couples who married for love.

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many parents show a strong preference for sons and a reluctance to bear daughters. This reluctance, in its extreme manifestations, can result in selective female infanticide as a means by which to avoid the economic burden of daughters (Diamond-Smith et al., 2008).

For much of human history and in many cultures today, arranged marriages, where parents or professional matchmakers select their children's marital partners, were and are normative. Such marriages often occur at a younger age than is typical in Western industrialized countries. Arranged marriages are most common in Asia, Africa, and the Middle East (Anukriti & Dasgupta, 2017). Generally, such marriages are focused on the union of two families rather than on love between two individuals. Given this orientation, it is perhaps not surprising to find that couples in arranged marriages have very different expectations of their spouses. There are decreased expectations of intimacy and love, and responsibility and commitment are emphasized. Despite

these variations, couples in arranged marriages appear to be about equally happy in their relationships as those in love marriages (Regan et al., 2012; Myers et al., 2005).

Arranged marriages are viewed more positively by people in collectivistic cultures than by those from individualistic cultures (Buunk et al., 2010; Benjanyan et al., 2015). People from collectivistic cultures are also less likely to view love as an essential precondition for marriage (Levine et al., 1995). Indeed, the three most important determinants of marital quality in arranged marriages are gender, educational level, and being involved in selecting the spouse (Allendorf & Ghimire, 2013). However, in many cultures, the Western ideal of a relationship based on love and personal attraction seems to have changed the nature of arranged marriage, with “semi-arranged” marriages becoming more common (Naito & Geilen, 2005). In these situations, parents are heavily involved in the process of finding a marriage partner, but the young adult holds veto power over potential spouses.

In the United States, almost 90 percent of Americans say love is the most important reason to marry, followed closely by making a lifelong commitment and companionship (Geiger & Livingston, 2019). Despite this agreement, emerging adults today view marriage differently than did previous generations. For example, many young adults expect greater space for individual interests and pursuits in their marriage and put more emphasis on friendship and compatibility (Kefalas et al., 2005). Younger adults are less likely to view marriage and having children as essential for living a fulfilling life than are older adults (Barroso, 2020). Indeed, the vast majority of adults in the United States today view the primary purpose of marriage as “the mutual happiness and fulfillment of adults,” rather than as being based on parenting and children (Pew Research Center, 2007). Religious beliefs also affect the marriage rate. Religious people are more likely to endorse earlier marriage (Fuller et al., 2015), to marry at earlier ages (Uecker & Stokes, 2008), and to view marriage as central to their lives (Willoughby et al., 2015).

Women, more so than men, look for a partner who can support a family financially, whereas men care more about finding someone who shares their views on raising children (Parker & Stepler, 2017; Wang & Parker, 2014). However, more recent cohorts of young women are likely to have attained a higher educational level than previous generations of women and thus are generally more economically successful. For many couples, this has altered the dynamics of marriage. Specifically, in 1970, only 4 percent of women 35 to 44 years of age made more money than their husbands, but by 2015, this number increased to 38 percent (Murray-Close & Heggeness, 2018). One consequence is that marriage is now associated with increases in economic security for both men and women (Cohn & Fry, 2010).

**Marriage Trends** In many lower-income countries, marriage, especially for girls, occurs at earlier ages. A decade ago, approximately 1 in 4 girls married before the age of 18 years. Currently, 1 in 5 girls marries before adulthood. Although this number is an improvement, recent gains have been sidelined by the COVID-19 pandemic, and child marriage remains a problem (UNICEF, 2021).

The age at first marriage has also been rising across Europe and North America. Across 25 countries in Europe and North America, the average age at first marriage was slightly over 25 years, although the age of marriage ranged from 21 to 30 years (Geist, 2017). In most of the European Union states, the age at first marriage increased in the last decade by approximately 4 years. Currently, most of the population, with the exception of adults in Poland, Lithuania, and Sweden, marry after 30 years of age. Generally, the average age at which men marry is older than that of women (Corselli-Nordblad & Gereoffy, 2015).

In the United States in 1960, the age at first marriage was 20 years for women and 23 years for men. By 2019, this number rose to 28 years for women and 29.8 years for men (US Census Bureau, 2020). The increase in age at first marriage has occurred across all cohorts but is most prominent in young adults (Cohn et al., 2011), especially African Americans (Wang & Parker, 2014). Although marriage rates have declined, driven by the increased prevalence of cohabitation (Horowitz et al., 2019), later age at first marriage (US Census Bureau, 2020), and relatively stable divorce rates (Cohen, 2016), more than 90 percent of Americans will eventually marry (Kiersz, 2017).

Gender equity in a country is linked to delays in marriage, as are male unemployment rates (Geist, 2017). Almost a third of single adults cite getting on their feet financially and establishing themselves in stable jobs or careers as formidable obstacles to marriage, an orientation more common of urban young adults. Rural Americans, by contrast, are more likely to see marriage as an inevitable step toward adulthood, to marry early, and to hold traditional views on marriage (Kefalas et al., 2005; Wang & Parker, 2014).

**Marital Satisfaction** Marriages can be seen to have a life course, just as individuals do. The bulk of the research conducted in the previous decades suggested that marriage satisfaction, initially high during a “honeymoon period,” declined significantly over time in the average couple (Kurdek, 1999). However, this truism has recently been called into question as new sophisticated statistical techniques have allowed more fine-grained analyses of large data sets. It appears a minority of marriages initially reporting low satisfaction tend to show sharp increases in dissatisfaction over time. In other cases where marital satisfaction declines, couples are likely to be undergoing stressful life transitions (such as the birth of a child). However, the vast majority of marriages, if they start out happy, tend to stay happy for extended periods of time (Karney & Bradbury, 2020).

Generally, marital couples, whether they are heterosexual or of sexual-minority status, report similar levels of marital satisfaction (Jackson et al., 2014; Kurdek, 1998). Marriages seem to be just about as happy as they were a quarter-century ago, but husbands and wives spend less time doing things together. Married people do tend to be happier than unmarried people, though people in unhappy marriages are less happy than those who are unmarried or divorced (Ben-Zur, 2012; Myers, 2000).

Marital happiness is positively affected by increased economic resources, equal decision making, nontraditional gender attitudes, and support for the norm of lifelong marriage. Marital happiness is negatively affected by premarital cohabitation, extramarital affairs, wives’ job demands, and wives’ longer working hours. Increases in husbands’ share of housework appear to lower marital satisfaction among husbands but improve it among wives (Amato et al., 2003). Sharing household chores is viewed as very important to marital success by approximately 56 percent of American respondents, although women spend more time on chores (Geiger, 2016).

For most couples, sex impacts relationship quality. Sixty-one percent of married Americans report having a satisfying sexual relationship as very important for the marriage (Geiger, 2016), and the frequency of sex, sexual satisfaction, and marital satisfaction are closely related to and predict each other (McNulty et al., 2016). What may be more important than the actual amount of sex a married couple has is whether or not they both desire roughly similar levels of sexual activity. High discrepancy with respect to the desire for sexual activity is associated with lower relationship satisfaction, lower relationship stability, and greater conflict (Willoughby et al., 2014).

Another factor underlying marital satisfaction may be a difference in what the man and woman expect from marriage. Women tend to place more importance on emotional expressiveness than men do (Lavee & Ben-Ari, 2004). Empathy, validation, and caring are related to feelings of intimacy and better relationship quality (Sullivan et al., 2010). Men’s efforts to express positive emotion to their wives, to pay attention to the dynamics of the relationship, and to set aside time for activities focused on building the relationship are important to women’s perceptions of marital quality (Wilcox & Nock, 2006).

People who marry and stay married, especially women, tend to become better off financially than those who do not marry or who divorce (Hirschl et al., 2003; De Vaus et al., 2017). However, a large difference in wage earning potential between spouses is associated with decreases in happiness (Stutzer & Frey, 2006).

**Extramarital Sexual Activity** Estimates are that approximately 20 to 25 percent of marriages experience infidelity, with a 2 to 4 percent annual prevalence rate peaking in the summer (Fincham & May, 2017). Extramarital activity is more prevalent among younger adults and husbands than among wives (Smith, 2003; Labrecque & Whisman, 2017). Certain personality factors are predictive; individuals high in neuroticism and low

Couples who commute in the same direction are happier than couples who commute in different directions, regardless of whether or not they leave for work at the same time (Huang et al., 2012).



in agreeableness and conscientiousness are more likely to engage in infidelity (Fincham & May, 2017; Zare, 2011). Extramarital relations are most likely to occur with a close personal friend, neighbor, co-worker, or long-term acquaintance, although men are somewhat more likely to have an affair with a casual acquaintance (Labrecque & Whisman, 2017). Generally, extramarital activity occurs early in the relationship; marriages that last for long periods of time show decreasing risk (DeMaris, 2009). More than half of those engaging in extramarital sex will divorce or separate from their partner (Allen & Atkins, 2012).

Young adults of both sexes have become less permissive in their attitudes toward extramarital sex (Twenge et al., 2015). These beliefs are not limited to the United States. Across 40 nations, adults agreed that it was morally unacceptable for an adult to have an extramarital affair, with the vast majority listing infidelity as a greater wrong than gambling, homosexuality, premarital sex, and abortion. The only country in which adults did not agree with this assessment was France, where only 47 percent of adults found infidelity immoral (Poushter, 2014).

The changing landscape of technology has led to increased use of the internet as a means by which to initiate an extramarital affair (Hertlein & Piercy, 2006). While different couples define electronic acts of infidelity differently, they generally include such actions as viewing or participating in pornography, sending or receiving sexually explicit photographs or videos, engaging in sexual activity while online or on the phone, or messaging inappropriately intimate or sexual content to a person other than the spouse. While online acts of infidelity at times do not consist of actual physical contact, they can nonetheless be perceived as betrayals and result in similar negative consequences for the marital relationship (Whitty, 2003), including a loss of trust, psychological distress, and trauma (Schneider et al., 2012).

## checkpoint

can you...

- Identify several benefits of marriage?
- Discuss differences between traditional views of marriage and the way emerging and young adults view it today?
- Note cultural differences in methods of mate selection and historical changes in marrying age?
- Cite findings on sexual relations in and outside of marriage?
- Identify factors in marital satisfaction?

# Parenthood

Parents are important. In this section, we address the impact of this foundational relationship.

## CULTURAL AND CONTEXTUAL INFLUENCES

*Cultural Differences* Before 1965, women had an average of 4.5 to 7 children each. Currently, the global average is approximately 2 children per woman. Among the reasons for this sharp decline are women's education and empowerment. However, lower child mortality rates also seem to be at play. Where child mortality is high, parents are likely to have more children to ensure the survival of some (Roser, 2017).

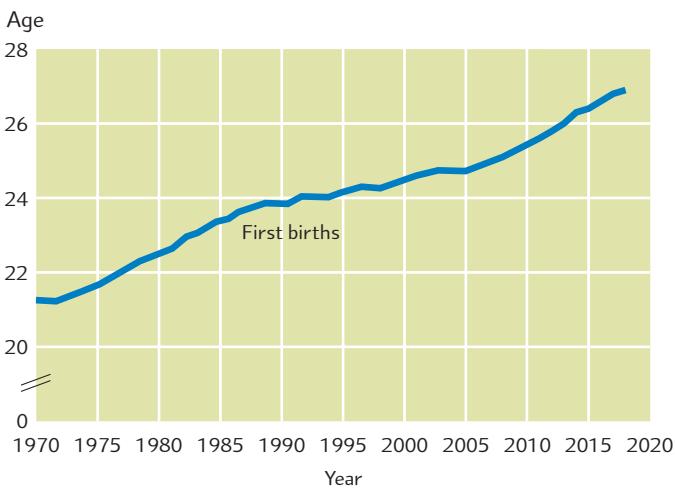
People in higher-income countries also typically have fewer children today than in earlier generations, and they start having them later in life. Across most mid- to high-income countries, the average age at first birth for women is at least 30 years, and all countries have seen this number rise since 2000. Similarly, in 2020, the average age of first births in the United States rose to 27 years (Figure 4; Organisation for Economic Co-operation and Development, 2021). The rise has been most dramatic for women in their forties, whose birthrate has risen almost continuously from 1985 to 2019 by approximately 3 percent a year (Osterman, et al., 2022).

A woman's age at first birth varies with ethnic and cultural background. In 2017, Asian American women had their first babies at an average age of 30.3, whereas American Indian and Alaska Native women gave birth for the first time, on average, at 23.3 years. Black women had their first child at 24.9 years, Hispanic women at 24.8 years of age, and White women had their first child at 27.6 years (Martin et al., 2018).

In 2017, 39.8 percent of US births were to unmarried women, a decline from the historic high of 41 percent in 2009 (Martin et al., 2018). The US fertility rate is higher than that in several other developed countries, such as Japan and the United Kingdom (Martin et al., 2002; van Dyk, 2005).



Both mothers and fathers prefer to hold babies on the left side of their bodies (Scola & Vauclair, 2010).



**FIGURE 4**

### Mean Age of Mother at First Birth: United States

*Many women today start families at a later age than in their parents' generation, raising the average age at first birth.*

Source: Martin et al. (2019).

Estimates are that somewhere from 2 million to 3.7 million children are being raised by LGBTQ+ parents (Gates, 2015). Approximately 191,000 of these children live with same-sex parents (US Census Bureau, 2019). There has been a decline in the number of LGBTQ+ parents in the past 2 decades, perhaps due to the declines in social stigma and increasing acceptance of alternative sexualities. LGBTQ+ people are coming out at an earlier age and are thus less likely to have children as the result of a previous heterosexual relationship (Gates, 2015).

At the same time, an increasing proportion of US heterosexual couples remain childless. The percentage of households with children fell from 45 percent in 1970 (Fields, 2004) to approximately 28.7 percent in 2016 (Schondelmyer, 2017). The birth rate dropped even further as a consequence of the COVID-19 pandemic (Brown, 2021).

The aging of the population as well as delays in marriage and childbearing may help explain these data, but some couples remain childless by choice. There is no one reason for their decision to remain childless, and most people, when asked, cite not wanting children as the primary rationale. However, approximately 19 percent cannot because of medical reasons, 17 percent would like to but are worried about finances, and 15 percent want children but do not have a partner (Brown, 2021).

**Dual-Income Families** In married family life of the past, men were traditionally viewed as the main providers, and women, if they worked, as secondary providers. These traditional gender roles are changing. In the United States today, almost 60 percent of married families with children have two working parents (US Bureau of Labor Statistics, 2021), and in nearly half of those families, mothers are employed full time (Livingston, 2018). Although a gender gap in income still exists, women are nonetheless providing an increasingly large percentage of family income. For example, in 2003, 25 percent of working wives earned more than their husbands (US Bureau of Labor Statistics, 2005). By 2015, that number had risen to 38 percent (Murray-Close & Heggeness, 2018).

Generally, combining work and family roles is good for both men's and women's mental and physical health and has positive effects on the strength of their relationship (Barnett & Hyde, 2001). However, juggling multiple roles—partner, parent, and employee—is often difficult. The family role is most demanding, especially for women, when children are young (Borelli et al., 2017), and the career role is most demanding when a worker is getting established or being promoted. Although both men and women say balancing work and family is difficult, women report more difficulty with this challenge and say they take care of more responsibilities related to children (Livingston, 2018).

For those parents who are not able to establish a satisfactory work-family balance, negative effects may snowball. The more hours worked, the greater the negative effect on work-family balance (McNamara et al., 2013). To cope with this, new parents may cut back on working hours, refuse overtime, or turn down jobs that require excessive travel to increase family time and reduce stress. Or a couple may make a trade-off, trading a career for a job or trading off whose work takes precedence depending on shifts in career opportunities and family responsibilities. Women are more likely to do the scaling back, which usually occurs during the early years of child rearing (Young & Schieman, 2018; Gauthier & Furstenberg, 2005).

Cross-cultural studies have suggested that the general relationship between work-family balance and well-being holds across different



*Spending leisure time with children is one of the many joys of parenthood.*

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countries. However, the effects are stronger in individualistic cultures than collectivistic cultures and in cultures that are more egalitarian with respect to gender roles (Haar et al., 2014). Government policies can also have an effect. When parents live in countries with supportive policies such as paid time off and child care subsidies, they show less of a decline in well-being after the birth of a child relative to parents in countries without such policies (Glass et al., 2016).

Fathers in 65 countries—but not in the United States—get paid paternity leave. In the United States, approximately 48 percent of workers in the private sector do not have paid leave to care for themselves, and even more lack paid leave to care for other family members such as children. Moreover, even of those who are legally entitled to take family leave, 78 percent do not because they cannot afford to do so (Quamie, 2010). The United States is the only industrialized nation without paid maternity leave, although a few states and industries have adopted paid family plans. For example, in December 2019, 12 weeks of paid parental leave for federal employees was signed into law (US Office of Personnel Management, 2019). Still, many parents, especially those with lower paying jobs, are not able to take any leave after the birth of a baby.

Evidence is emerging that the COVID-19 pandemic has had a profound effect on many families, particularly those with children (Lateef et al., 2021). Families with children were subject to more stressors than families without children given the prevalence of school closures and disrupted child care. Parents, to a greater degree than single adults and nonparents, were forced to pivot to caring full time for preschoolers and to homeschooling or monitoring school-aged children, all within the context and strain of economic disruptions, isolation from nonfamily members, and lack of breathing space. More research is needed in this area.

## RELATIONSHIP DYNAMICS

*Gender Differences in Parenting* Most mothers now work outside the home. The labor force participation rate (the percent of people working or looking for work) for mothers with children under the age of 6 years is 65.8 percent, a number that rises to 75.9 percent when mothers with children age 7 to 17 years are included (US Bureau of Labor Statistics, 2021). Despite working outside the home, women spend more time on child care than their counterparts did in the 1960s, when 60 percent of children lived with a breadwinner father and a stay-at-home mother (Bianchi et al., 2006). Today, only about 20 percent of children live in such families (Livingston, 2018).

Generally, most fathers are not as involved as mothers are. However, the amount of time fathers spend with their children has gone up. For example, in 1965, married fathers reported spending 2.5 hours a week on child care and 4 hours a week on housework. In 2016, married fathers spent more than three times as much time with child care (8 hours) and more than double the time doing housework (10 hours). By 2011, the time spent with their children on a weekly basis rose to 7.3 hours per week (Parker & Wang, 2013). On weekends, as their children get older, the time fathers spend with their children is more equal to that of mothers (Yeung et al., 2001). And, although they are vastly outnumbered by mothers, there has been an uptick in the number of stay-at-home fathers, who now account for 7 percent of stay-at-home parents (Livingston & Parker, 2019). The gendered division of labor in child care by men and women has been found in the United States, as well as a variety of countries in Europe and Asia (Craig & Mullan, 2011; García-Mainar et al., 2011; Oshio et al., 2013).

*Marital Satisfaction* How does parenthood affect the relationship between marriage partners? Some studies show that marital satisfaction typically declines during the child-raising years—and the more children, the greater the decline. Moreover, mothers of young infants tend to feel the effects most strongly. For example, only 38 percent of new mothers report high marital satisfaction compared with 62 percent of childless wives (Twenge et al., 2003).

Declines occur because new parents are likely to experience stressors that can affect their health and state of mind. Taking care of newborn babies is difficult and often comes



Having children doesn't just change fathers' lives, it changes their physiology. Fathers who are involved in a pregnancy show decreased levels of testosterone over the course of the pregnancy (Berg & Wynne-Edwards, 2001). Presumably, this is nature's way of preparing fathers for child care.

## checkpoint can you ...

- ▶ Describe trends in family size and age of parenthood?
- ▶ Compare men's and women's attitudes toward and exercise of parental responsibilities?
- ▶ Discuss how parenthood affects marital satisfaction?

When considering affairs, men are less likely to break up with a woman who had a homosexual rather than a heterosexual affair. For women, on the other hand, a homosexual affair on the part of their male partner is more likely to end the relationship (Confer & Cloud, 2011).



with sleep deprivation, uncertainty, and isolation. Nighttime crying, for example, is associated with a decrease in marital satisfaction in the 1st year of the child's life (Meijer & van den Wittenboer, 2007). If the woman was working outside the home and is now staying home, the burden of housework and child care may fall mostly on her. Indeed, the division of household tasks is a common issue among new parents (Schulz et al., 2006). Many couples find their relationship becoming more "traditional" following the birth of a child, with the woman often engaging in the bulk of caregiving and housekeeping (Cox & Paley, 2003). The perceptions of unfairness and inequity that result from this process can damage the marital relationship (Dew & Wilcox, 2011).

However, the picture is not all bad. Other studies tell a different story and have found no differences in marital satisfaction in the 1st year of marriage for couples that do and do not have children (McHale & Huston, 1985). Some data indicate that parents have greater happiness, positive emotions, and meaning in life than nonparents (Nelson et al., 2013).

Although it has been documented across a wide variety of cultures, the decline in marital satisfaction in response to childbirth does not seem to be universal. For example, the Igbo people of Nigeria show increases in marital satisfaction with the birth of a child. In their case, marital satisfaction is more closely related to the birth of a child than to income or education, and the more children in a family, the higher the reported rates of marital satisfaction (Onyishi et al., 2012). This suggests many of the findings linking children and marital satisfaction have more to do with the context in which they occur than they do with any intrinsic effect of childbearing. For example, some research has shown the influence of children on a marriage depends on whether or not the couple was happy prior to the pregnancy, the couple's attachment representations, family cohesion, whether or not the pregnancy was planned, the age of parents at the birth of a child, and a good work-life balance (Lawrence et al., 2008; Lindblom et al., 2014; Nelson et al., 2013; Kohn et al., 2012; van Steenbergen et al., 2011).

## When Marriage Ends

In the United States, the average marriage that ends in divorce does so after 7 or 8 years (Kreider, 2005). Divorce, more often than not, leads to remarriage with a new partner and the formation of a stepfamily, which includes children born to or adopted by one or both partners before the current marriage.

### DIVORCE

The US divorce rate has decreased sharply since 1970 and was approximately 2.7 adults per 1,000 people in 2019 (Centers for Disease Control and Prevention, 2021). Divorce rates vary depending on the age of the cohort examined. In younger couples, divorce rates are roughly twice what they are in the oldest cohort. However, divorce rates are declining in all groups, and the sharpest drops have occurred among younger cohorts. For example, in 2015, approximately 24 percent of married adults aged 25 to 39 years got a divorce. Although this is still roughly double the rate experienced by adults 50 years and older, it nonetheless represents a 21 percent drop from 1990 (Stepler, 2017).

**Predictors of Divorce** The most frequently cited reasons for divorce are incompatibility and lack of emotional support; for more recently divorced, presumably younger, women, this included lack of career support. Spousal abuse was third, suggesting that intimate partner violence may be more frequent than is generally realized (Dolan & Hoffman, 1998). Other common risk factors for divorce include premarital cohabitation (Tach & Halpern-Meekin, 2009) and infidelity (Balsam et al., 2017; Hall & Fincham, 2006).

Economic resources and work are also related to divorce risk. However, effects vary with respect to gender. Husbands' unemployment is associated with a greater risk of

divorce (Killewald, 2016). For wives, the relationship is more complex. Risks associated with wives' employment are most notably those linked to tension over the division of labor (Ruppanner et al., 2018), a relationship that increases with the number of hours worked by wives. Additionally, greater economic independence means that when they do wish to leave a marriage, women are more able to do so. Thus, women's employment is associated with wives' decisions to divorce their husbands, but only in those women who are unhappy (Sayer et al., 2011). Importantly, however, wives' work can also have positive effects on marriage stability via the increased income and subsequent reductions in economic concerns (Amato, 2010).

Who a person is also matters. College-educated women, who previously were the most permissive about divorce, have become less so, whereas women with lower educational levels have become more permissive and thus more likely to divorce (Martin & Parashar, 2006). Age at marriage is another predictor of whether a union will last (Kuperberg, 2014). The decline in divorce thus may reflect higher educational levels as well as the later age of first marriages, both of which are associated with marital stability (Popenoe & Whitehead, 2004). It also may reflect the rise in cohabitation, which, if it ends, does not end in divorce (Kennedy & Ruggles, 2013). Teenagers, high school dropouts, and nonreligious persons also have higher divorce rates (Bramlett & Mosher, 2002; Popenoe & Whitehead, 2004).

There are also racial and ethnic differences in divorce. Overall, African-American, Native American, and US-born Hispanic couples have the highest rates of divorce, and Asian-American, foreign-born Hispanic women, and most immigrants have lower divorce rates (Raley et al., 2020). In addition, interracial couples, particularly those involving White females with Asian or Black males, are more likely to divorce than same-race couples (Bratter & King, 2008).

There is less information on same-sex or sexual-minority couples. Research from European countries—where marriage equality has been legal for longer—shows lower levels of marriage stability and a higher divorce rate in same-sex couples (Bennett, 2017). However, in the United States, where same-sex marriage was legalized in 2015, there are some suggestions that married same-sex couples have lower rates of divorce than opposite-sex couples, perhaps because many stable, long-term couples were forced to wait for the passage of marriage equality to formalize their relationship (Raley et al., 2020).

Generally, couples are more likely to stay married if they have children (Bernardi & Martínez-Pastor, 2011). However, instead of staying together “for the sake of the children,” some embattled spouses conclude that exposing children to continued parental conflict does greater damage (Eisenberg, 1998).

**Adjusting to Divorce** Ending even an unhappy marriage can be painful for both partners, especially when there are young children in the home. Issues concerning custody and visitation often force divorced parents to maintain contact with each other, and these contacts may be stressful (Williams & Dunner-Bryant, 2006). However, by the same token, a positive co-parenting relationship following a divorce can be protective for both children and parents (Lamela et al., 2016).

Divorce tends to reduce long-term well-being, particularly for the partner who did not initiate the divorce or does not remarry (Amato, 2010; Amato, 2000). Especially for men, divorce can have negative effects on physical or mental health or both (Sbarra, 2015). Women are more likely than men to experience a sharp reduction in economic resources and living standards after separation or divorce (De Vaus et al., 2017; Kreider & Fields, 2002; Williams & Dunne-Bryant, 2006); however, women in unhappy marriages benefit more from the dissolution of the relationship than men in unhappy marriages (Waite et al., 2009). People who were—or thought they were—happily married tend to react more negatively and adapt more slowly to divorce (Lucas et al., 2003). On the other hand, when a marriage was highly conflictual, its ending may improve well-being in the long run (Amato, 2000).

An important factor in adjustment is emotional detachment from the former spouse. People who argue with their ex-mates experience more distress. An active social life, both



Should couples stay together for the sake of the children? Advice on this varies. However, data suggest those children whose parents were high in conflict but stayed together are more likely to divorce in adulthood than children whose parents did divorce (Gager et al., 2021).



Divorce can be catching. People who have others in their social network who are divorcing are more likely to get divorced themselves (McDermott et al., 2013).

at the time of divorce and afterward, helps, as does social support (Amato, 2000; Barutçu et al., 2015). Finding a new partner, in particular, is associated with well-being following a divorce (Symoens et al., 2013).

## REMARRIAGE AND STEPPARENTHOOD

Approximately 20 percent of US marriages are remarriages for both bride and groom, and about 8 percent of newly married adults have been married 3 times or more. While rates for older adults are relatively high, rates for younger adults have dropped in recent decades. For example, in 1960, 72 percent of young adults who had divorced or widowed were remarried again by the age of 35. In 2013, only 42 percent of adults age 35 and younger under the same circumstances remarried (Livingston, 2014). Part of this may be because adults in less stable relationships, who in previous generations might have married, instead cohabit. Thus, when their relationship ends, there is no corresponding divorce (Raley et al., 2020).

Men and women living with children from a previous relationship are most likely to form a new union with someone who also has resident children, thus forming a stepfamily (Goldscheider & Sasser, 2006). Families in which both parents bring children into the marriage are marked by higher levels of conflict (Heatherington, 2006). Remarriages are more likely than first marriages to end in divorce (Lewis & Kreider, 2015).

The more recent the current marriage and the older the stepchildren, the harder stepparenting seems to be. Women, especially, seem to have more difficulties in raising stepchildren than in raising biological children, perhaps because women generally spend more time with the children than men do (MacDonald & DeMaris, 1996). The conflict experienced by stepparents can be mitigated with healthy and open communication between the two partners (Pace et al., 2015). The stepfamily, as any family, has the potential to provide a warm, nurturing atmosphere for children.

### checkpoint can you ...

- Give reasons for the decrease in divorce since 1981?
- Discuss factors in adjustment to divorce?
- Discuss factors in adjustment to remarriage and stepparenthood?

## summary and key terms

### Developmental Tasks of Emerging Adulthood

- Emerging adulthood is often a time of experimentation before assuming adult roles and responsibilities. Such traditional developmental tasks as finding stable work and developing long-term romantic relationships may be postponed until the thirties or even later.
- Paths to adulthood may be influenced by such factors as gender, academic ability, early attitudes toward education, expectations in late adolescence, social class, and ego development.
- Emerging adulthood offers a moratorium, a period in which young people are free from pressure to make lasting commitments.
- A measure of how successfully emerging adults handle the developmental task of leaving the childhood home is their ability to maintain close but autonomous relationships with their parents.

- Remaining in the parental home is increasingly common among emerging and young adults, who do so often for financial reasons. This can complicate the negotiation of an adult relationship with parents.

### Personality Development: Four Views

- Four theoretical perspectives on adult personality development are normative-stage models, the timing-of-events model, trait models, and typological models.
- Normative-stage models hold that age-related social and emotional change emerges in successive periods sometimes marked by crises. In Erikson's theory, the major issue of young adulthood is intimacy versus isolation.
- The timing-of-events model proposes that adult psychosocial development is influenced by the occurrence and timing of normative life events. As society becomes less age-conscious, however, the social clock has less meaning.

- The five-factor model of Costa and McCrae is organized around five groupings of related traits: neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness. Current studies find that each of these traits changes during young adulthood and to some extent throughout life.
- Typological research, pioneered by Jack Block, has identified personality types that differ in ego-resiliency and ego-control. These types seem to persist from childhood through adulthood.

**normative-stage models (412)**

**intimacy versus isolation (412)**

**timing-of-events model (413)**

**normative life events (413)**

**social clock (413)**

**trait models (414)**

**five-factor model (414)**

**typological approach (415)**

**ego resiliency (415)**

**ego control (415)**

of divorce, difficulty in finding a suitable mate, and lack of dating opportunities or of available mates.

- The ingredients of long-term satisfaction are similar in homosexual and heterosexual relationships.
- Gays and lesbians in the United States have made great strides but continue to experience bigotry and stigma.
- With the new stage of emerging adulthood and the delay in age of marriage, cohabitation has increased and has become the norm in some countries.
- Cohabitation can be a trial marriage, an alternative to marriage, or, in some places, almost indistinguishable from marriage. Cohabiting relationships in the United States tend to be less stable than marriages.
- Marriage (in a variety of forms) is universal and meets basic economic, emotional, sexual, social, and child-raising needs.
- Mate selection and marrying age vary across cultures. People in industrialized nations now marry later than in past generations.
- Men's and women's differing expectations may be important factors in marital satisfaction.

## Relationships in Emerging Adulthood

- Young adults seek intimacy in relationships with peers and romantic partners. Self-disclosure is an important aspect of intimacy.
  - Most young adults have friends but have increasingly limited time to spend with them. Women's friendships tend to be more intimate than men's.
  - Many young adults have friends who are considered fictive kin or psychological family.
  - According to Sternberg's triangular theory of love, love has three aspects: intimacy, passion, and commitment.
- fictive kin (418)**
- triangular theory of love (418)**

## Marital and Nonmarital Lifestyles

- Today, more adults than in the past postpone marriage or never marry. The trend is particularly pronounced among African American women and people from lower socioeconomic classes.
- Reasons for staying single include career opportunities a desire for self-fulfillment, women's greater self-sufficiency, reduced social pressure to marry, financial constraints, fear

## Parenthood

- Today women in industrialized societies are having fewer children and having them later in life, and an increasing number choose to remain childless.
- Fathers are usually less involved in child raising than mothers but more so now than in previous generations.
- Marital satisfaction typically declines during the childbearing years.
- In most cases, the burdens of a dual-earner lifestyle fall most heavily on the woman.
- Family-friendly workplace policies may help alleviate marital stress.

## When Marriage Ends

- Divorce rates in the United States have fallen from their high in 1981. Among the likely reasons are increasing educational levels, the delay in age of marriage, and the rise in cohabitation.
- Adjusting to divorce can be painful. Emotional distance from the ex-spouse is a key to adjustment.
- Many divorced people remarry within a few years, but remarriages tend to be less stable than first marriages.
- Stepfamilies may go through several stages of adjustment.

## outline

Middle Age: A Social Construct

### PHYSICAL DEVELOPMENT

Physical Changes

Physical and Mental Health

### COGNITIVE DEVELOPMENT

Cognitive Development at Midlife

The Distinctiveness of Adult Cognition

Creativity

Work and Education

## learning objectives

Explain how midlife is changing and define middle adulthood.

Discuss physical changes in middle adulthood.

Characterize health and well-being in middle age.

Identify cognitive changes in middle adulthood.

Describe creative achievement and the relationship between creativity and age.

Discuss trends in work, retirement, and education in middle adulthood.

# Physical and Cognitive Development in Middle Adulthood



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### did you know?

- One-third of Americans in their seventies think of themselves as middle-aged.
- Positive personality traits are related to good health and long life.
- Middle-aged people who engage in complex work tend to show stronger cognitive performance than their peers.

*In this chapter, we examine physical changes during midlife as well as physical, sexual, and mental health issues. We look at factors that affect intelligence, thought processes, and creativity. Finally, we look at work, retirement, and educational pursuits.*



**I** believe that everyone else my age is an adult whereas I am merely in disguise.

—Margaret Atwood (b. 1939)

## Middle Age: A Social Construct

Like adolescence, midlife is a social contract (Cohen, 2012). The term *midlife* first came into the dictionary in 1895 (Lachman, 2004) as life expectancy began to lengthen. Today, in industrial societies, middle adulthood is considered to be a distinct stage of life with its own societal norms, roles, opportunities, and challenges. However, some traditional societies, such as upper-caste Hindus in rural India (Menon, 2001) and the Gusii in Kenya, do not recognize a middle stage of adulthood at all.

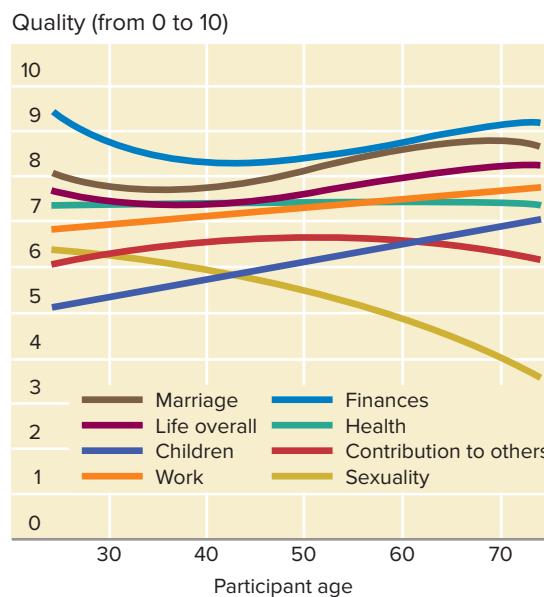
We define middle adulthood in chronological terms as the years between ages 40 and 65, but this definition is arbitrary. In 2019, 83.3 million people in the United States, or 25.4 percent of the population, were between the ages of 45 and 64 years (US Census Bureau, 2018). Most middle-aged people are in good physical, cognitive, and emotional shape and feel good about the quality of their lives (Lachman et al., 2015; Fleeson, 2004; see Figure 1). However, the experience of middle age varies with health, gender, race/ethnicity, socioeconomic status, cohort, and culture, as well as with personality, marital and parental status, and employment.

Middle age is marked by growing individual differences and a multiplicity of life paths (Lachman, 2004). Some middle-aged people can run marathons, others get winded climbing a flight of stairs. Some feel a stable sense of control over their lives, others feel overwhelmed handling weighty responsibilities and multiple demanding roles: running households, departments, or enterprises; launching children; and perhaps caring for aging parents or starting new careers (Lachman, 2001). Middle age can be a time of decline and loss, or it can be a time of mastery, competence, and growth.



Many middle-aged people, such as Keanu Reeves and girlfriend Alexandra Grant, are at the peak of their careers, enjoying a sense of freedom, responsibility, and control over their lives and making important contributions to social betterment.

Juan Pablo Rico/Sipa USA/Alamy Stock Photo



**FIGURE 1**  
How US Adults of Various Ages Rate Aspects of Their Quality of Life and Overall Quality of Life

Source: Fleeson (2004); data from MacArthur Foundation Research Network on Successful Midlife Development (the MIDUS National Survey).

**checkpoint** *can you...*

- Cite individual differences in the experience of middle age?

# PHYSICAL DEVELOPMENT

## Physical Changes

Although some physiological changes are direct results of biological aging and genetic makeup, behavioral and lifestyle factors dating from youth can affect the likelihood, timing, and extent of physical change in middle adulthood.

People perceive their hands to be shorter and fatter than they actually are (Longo & Haggard, 2010).



### presbyopia

Age-related, progressive loss of the eyes' ability to focus on nearby objects due to loss of elasticity in the lens.

### myopia

Nearsightedness.

### presbycusis

Age-related, gradual loss of hearing, which accelerates after age 55, especially with regard to sounds at higher frequencies.

Loss of smell and taste was one of the first identified signs of COVID-19 infection.

Although most people recover, some COVID survivors lose their sense of smell and taste for up to a year after infection. Others recover their senses but experience parosmia, a distorted sense of smell (Marshall, 2021).



### SENSORY FUNCTIONING

From young adulthood through the middle years, sensory and motor changes are almost imperceptible—until one day a 45-year-old man realizes that he cannot read a book without eyeglasses or a 60-year-old woman has to admit that she is not as quick on her feet as she was.

You may have seen older people using reading glasses or holding books or newspapers as far out as possible with one arm when trying to focus. As people age, they have difficulty focusing on near objects, a condition known as **presbyopia**. The incidence of **myopia** (nearsightedness) also increases throughout middle age (Rosenthal & Fischer, 2014). In 2015, 1.8 billion people worldwide had vision impairment as a result of presbyopia, and only about 45 percent of them—most of whom lived in urban areas in more developed countries—had access to adequate vision correction (Fricke et al., 2018). The highest prevalence of untreated presbyopia is in the Latin American region (Berdalh et al., 2020). The incidence of myopia also increases throughout middle age. By the age of 65, 36.6 percent of adults will have some form of visual disability (Rosenthal & Flscher, 2014).

How do people adjust to these changes? Because of changes in the eye, they need about one-third more brightness to compensate for the loss of light reaching the retina (Troll, 1985). Reading glasses, bifocals, and trifocals are also used to aid the eye in focusing on objects. Untreated vision issues exert a personal as well as a social cost. For example, uncorrected presbyopia can lead to declines in quality of life and difficulty with completing tasks requiring near vision. Moreover, estimates are that untreated presbyopia costs the global market 11 billion dollars a year (Berdalh et al., 2020).

Age-related, gradual hearing loss is known as **presbycusis**. It is rarely noticed earlier in life, but it generally speeds up and becomes noticeable in the fifties. Presbycusis usually begins with higher-pitched sounds less important for understanding speech and gradually extends into lower pitches. Although significant hearing loss is not common in middle-age adults, it is an important factor affecting well-being in older adults. The loss of the ability to hear speech effectively can isolate adults and is associated with anxiety, depression, and cognitive declines (Fischer et al., 2016).

Hearing loss proceeds more quickly in men than in women (Ozmeral et al., 2016). Prevalence is higher among Hispanics and non-Hispanic White adults than among African Americans (Goman & Lin, 2016). However, the most important factor in hearing loss is environmental noise. Estimates are that 7 to 21 percent of hearing loss in adults can be attributed to noise experienced at a work site. Noise-induced hearing loss is higher in developing countries and in military, manufacturing, and construction jobs (Lie et al., 2016; Neitzel & Fligor, 2019). Although hearing protectors such as earplugs have decreased the impact of occupational noise, “social noise” (including concerts and headphones) has increased (Sliwinska-Kowalska & Davis, 2012; Krug, 2015).

Sensitivity to taste and smell generally begins to decline in midlife. Approximately 13.5 percent of adults over the age of 40 years have problems with their sense of smell, 17.3 percent with their sense of taste, and 2.2 percent with both smell and taste (Liu et al., 2016). By the age of 80, over 75 percent of adults show declines in taste and smell sensitivity (Doty, 2018). These declines are more common in men, African Americans, people who consume large amounts of alcohol, and adults with cardiovascular disease (Liu et al., 2016; Ajmani et al., 2017).

As the taste buds become less sensitive and the number of olfactory cells diminishes, foods may seem more bland (Merrill & Verbrugge, 1999). Additionally, the use of medicines that treat many diseases of aging can also have a negative effect on the gustatory senses (Imoscopi et al., 2012), as can smoking (Vennemann et al., 2008). These declines have implications for quality of life and are associated with Alzheimer's and Parkinson's diseases and mortality risk (Doty, 2018).

## PHYSICAL FITNESS

Staying physically active has wide-ranging positive effects on almost every body system, including physical health markers such as reduced cardiovascular risk, psychological markers such as decreased risk of depression, and cognitive markers such as decreased risk of dementia (Bauman et al., 2016). The more people do, the more they can do, and the longer they can do it for.

Some loss of muscle strength is usually noticeable by age 45; 10 to 15 percent of maximum strength may be gone by 60. This is partly due to a loss of muscle fiber, which is replaced by fat (Guralnik et al., 2006; Schaap et al., 2012). Additionally, changes in the skeletal muscle fiber itself lead to decrements in the ability to shorten quickly and forcefully (Brocca et al., 2017), and the fibers lose some of their ATP-producing capacity with age, thus producing less molecular energy (Porter et al., 2015). Still, impairment is not inevitable; strength training and a high protein diet can protect against these declines (Bradlee et al., 2017; Francis et al., 2017).

**Basal metabolism** is the minimum amount of energy, typically measured in calories, that your body needs to maintain vital functions while resting. As people age, the amount of energy needed to maintain the body goes down, particularly after age 40. So, for example, older people often put on weight later in life despite no change in eating or exercise habits (Merrill & Verbrugge, 1999). Weight gain in early adulthood is predictive of major chronic diseases later (Zheng et al., 2017) and in middle age is associated with an increased risk of complications in the event of COVID-19 infection (Yang et al., 2021). Staying active can help adults maintain current weight, retain physical skills, and slow declines.

Manual dexterity, especially for men and in the nondominant (in this study, the left) hand, generally becomes less efficient with age (Vasylenko et al., 2018). Simple reaction time (as in pressing a button when a light flashes) slows very little until about age 50, but choice reaction time (as in pressing one of four numbered buttons when the same number appears on a screen) slows gradually throughout adulthood (Woods et al., 2015; Der & Deary, 2006). When a vocal rather than a manual response is called for, age differences in simple reaction time are substantially less (Johnson & Rybush, 1993). How firmly a person can grab something may seem like a frivolous measure; however, grip strength at midlife has been associated positively with whole brain volume and white matter integrity (Dercon et al., 2021).

## THE BRAIN AT MIDLIFE

The aging brain can be described in two ways: as working more slowly and as having difficulty juggling multiple tasks (Zanto & Gazzaley, 2014). This general process affects multiple tasks across many different areas—from understanding complex language to driving a car skillfully to learning new skills. What these disparate tasks have in common is the necessity to quickly process complex information and pay attention to relevant stimuli while simultaneously ignoring irrelevant stimuli. In particular, the ability to ignore distractions gradually declines with age, which makes multitasking increasingly challenging (Madden & Langley, 2003; Stevens et al., 2008).

Starting at about age 35, there is a steady decline in whole brain volume of approximately 0.2 percent per year that accelerates to 0.5 percent as adults near 60 years of age.



*Though strength and coordination may decline, many middle-aged people who remain active show benefits in both psychological and physical health.*

Ronnie Kaufman/Blend Images LLC

### basal metabolism

Use of energy to maintain vital functions.



*One set of researchers noted this distractibility during their brain scans of younger and older adults. They realized the performance of the older adults was being disrupted by the banging and clanging of the MRI machine (Stevens et al., 2008).*

(Hedman et al., 2012). This loss is in part due to a decrease in the volume of gray matter, primarily in the prefrontal cortex (Terribilli et al., 2011). Additionally, myelin, the fatty sheath that lines nerve axons and helps impulses move more quickly through the brain, also begins to break down with age (Lu et al., 2013; Chopra et al., 2018; Salami et al., 2012). The specific location and extent of these changes in the gray and white matter are associated with the severity of processing slowdown and the area of cognition in which it occurs (Eckert, 2011; Hong et al., 2015). For example, people who show atrophy in the left insula, an area of the brain associated with speech production, are more likely to experience the tip-of-the-tongue phenomenon, in which a person knows they know a word but cannot access it (Shafto et al., 2007).

Although some declines are likely, declines are neither inevitable nor necessarily permanent. In the past, it was believed that education helped slow the declines associated with age. However, although education is associated with higher IQ and superior performance on a variety of cognitive tasks, it does not appear to delay declines in processing speed or cognitive functioning. Rather, adults with a high level of education start off ahead and hence may function at a higher level for a longer period of time (Zahodne et al., 2011; Lenehan et al., 2015; Ritchie et al., 2013).

Two factors that do seem to be important are keeping both body and mind busy. Although effects sizes are small, meta-analyses have found that physical activity and fitness are associated with higher white and gray matter volume (Tarumi et al., 2021; Sexton et al., 2016; Erickson et al., 2014). Moreover, physical activity in midlife is positively associated with cognitive function during midlife itself, as well as with protection against future cognitive declines (Cox et al., 2016; Sofi et al., 2011). Last, reviews of both aerobic exercise and resistance training interventions have shown they are effective in improving attention, processing speed, executive function, and memory, although effects are generally modest in size (Smith et al., 2010; Chang et al., 2012). It may be that some of the benefits associated with exercise are due to general processes such as changes in blood volume or vessels, or changes in gray matter density (Thomas et al., 2012).

A busy mind is also important. Adults who read and write on a regular basis or who work in a cognitively stimulating environment are more likely to retain their cognitive functions (Cotrena et al., 2016; Smart et al., 2014). There is also some evidence that meditation affords cognitive benefits to middle-aged adults and may help offset declines (Gard et al., 2014). Cognitive interventions and mental stimulation have also been shown to be effective in improving functioning (Lampit et al., 2014).

The aging brain compensates for functional declines in part by recruiting a larger number of brain areas to work together to distribute processing demands more widely for difficult tasks (Davis et al., 2012). However, when declines occur nonetheless, knowledge based on experience can help compensate for the physical changes. For example, middle-age adults are better drivers than younger ones (McFarland et al., 1964). More experienced drivers are better at anticipating potential hazards before they become dangerous, shifting their gaze around the environment, whereas novice drivers tend to stare straight ahead and respond only to clear and imminent hazards (Borowsky et al., 2010). Similarly, 60-year-old typists are as efficient as 20-year-olds (Spirduso & MacRae, 1990), and skilled industrial workers in their forties and fifties are often more productive than younger workers and in fact tend to be more conscientious and careful (Salthouse & Maurer, 1996).

## STRUCTURAL AND SYSTEMIC CHANGES

By the fifth or sixth decade, the skin may become less taut and smooth as the layer of fat below the surface becomes thinner, collagen molecules more rigid, and elastin fibers more brittle. Hair may become thinner due to a slowed replacement rate and grayer as production of melanin, the pigmenting agent, declines. Middle-aged people tend to gain weight as a result of accumulation of body fat and lose height due to shrinkage of the intervertebral disks (Merrill & Verbrugge, 1999; Whitbourne, 2001).

Bone density normally peaks in the twenties or thirties. From then on, people typically experience some bone loss as more calcium is absorbed than replaced, causing

*Another way to keep your brain sharp?  
Google it. Older adults asked to surf the web showed significant activation in areas of the brain related to reasoning and decision making. This effect was strongest for experienced surfers, but the researchers argued that even technologically unsophisticated adults should benefit (Small et al., 2009).*



*Research suggests it's the quantity and depth of your wrinkles, not their location, that make you appear older (Aznar-Casanova et al., 2010).*



bones to become thinner and more brittle. Bone loss accelerates in the fifties and sixties; it occurs far more rapidly in women than in men, sometimes leading to osteoporosis (Noh et al., 2018).

Heart disease begins to emerge in the late forties or early fifties. Arterial walls may become thicker and more rigid. The heart may begin to pump more slowly and irregularly in the midfifties; and by age 65, it can lose up to 40 percent of its aerobic power. **Vital capacity**—the maximum volume of air the lungs can draw in and expel—may begin to diminish at about age 40 and can drop by as much as 40 percent by age 70 (Merrill & Verbrugge, 1999; Whitbourne, 2001). The body temperature of older people is lower, and they are less able to maintain an appropriate body temperature in extremely hot or cold environments (Blatteis, 2012). Sleep is also affected by age; middle-aged adults are less likely to fall asleep in the daytime, need less sleep to maintain alertness, and show reductions in slow wave sleep at night when compared to adolescents and emerging adults (Dijk et al., 2010).

## checkpoint can you...

- Summarize changes in sensory and motor functioning and body structure and systems that may begin during middle age?
- Describe changes in the brain at midlife?

## SEXUALITY AND REPRODUCTIVE FUNCTIONING

Although both sexes experience losses in reproductive capacity sometime during middle adulthood—women become unable to bear children and men’s fertility begins to decline—sexual enjoyment continues throughout adult life (see Table 1).

**Infertility** An estimated 8.8 percent of US women age 15 to 49 years old experience **infertility**: the inability to conceive a baby after 12 months of intercourse in the absence of birth control methods. Women’s fertility begins to decline in their late twenties, with substantial decreases during their thirties. By their forties, many women are not able to become pregnant without the use of assisted reproductive technology (ART). Men’s fertility is less affected by age but begins to decline in the late thirties (Dunson et al., 2002). Approximately 30 percent of couples are unable to become parents (Gameiro & Finnigan, 2017), and estimates are that 8 to 12 percent of the approximate 48 million couples worldwide are infertile (Ombelet, 2020).

The most common cause of infertility in men is production of too few sperm. In some instances, an ejaculatory duct may be blocked, preventing the exit of sperm, or sperm may be unable to swim well enough to reach the cervix (O’Flynn O’Brien et al., 2010).

A major cause of declining fertility in women after age 30 is deterioration in the quality of ova. Infertility can also result from blockage of the fallopian tubes, preventing ova from reaching the uterus. This blockage may occur as the result of scar tissue formation from sexually transmitted infections. In addition, some women suffer from physical disorders affecting fertility, such as polycystic ovarian syndrome or primary ovarian insufficiency (Centers for Disease Control and Prevention, 2022).

In both men and women, modifiable environmental factors are related to infertility. For example, overweight men and women (Campbell et al., 2015; Silvestris et al., 2018) are more likely to have issues with fertility. Smoking also appears to have a strong negative

### vital capacity

Amount of air that can be drawn in with a deep breath and expelled.

### infertility

Inability to conceive a child after 12 months of sexual intercourse without the use of birth control.



Cannabis negatively affects male fertility (Payne et al., 2019).

**TABLE 1** Changes in Human Reproductive Systems during Middle Age

	Female	Male
Hormonal changes	Drop in estrogen and progesterone	Drop in testosterone
Symptoms	Hot flashes, vaginal dryness, urinary dysfunction	Undetermined
Sexual changes	Less intense arousal, frequent and quicker orgasms	Less frequent erections, longer recovery between erections, risk of erectile dysfunction
Reproductive capacity	Ends	Some decrease in fertility

effect on fertility. Other factors, such as psychological stress, high levels of caffeine and alcohol consumption, and exposure to environmental pollutants have been implicated, but the evidence for their negative effects is less strong (Hoffman et al., 2007).

Assisted reproductive technologies (ARTs; also discussed in Chapter 3), most commonly in vitro fertilization (IVF), offer hope for those who experience infertility. However, IVF success rates are not very high. Approximately 38 percent of women age 35 to 37 have a live birth following egg retrieval. However, women age 38 to 40 years have only a 24.4 percent success rate. By the age of 40 years, the success rate drops to 7.9 percent (Centers for Disease Control and Prevention, 2021). Transfer of multiple embryos increases the odds of IVF success but also carries risks to mother and baby. Thus, many advocates support single embryo transfers coupled with subsequent frozen-thawed embryo transfers for infertile couples wanting multiple children, and many countries pose restrictions on the number of embryos transferred per IVF cycle (Brezina & Zhao, 2012).

#### menopause

Cessation of menstruation and of ability to bear children.

#### perimenopause

Period of several years during which a woman experiences physiological changes of menopause; includes first year after end of menstruation; also called the *climacteric*.

**Menopause** Menopause takes place when a woman permanently stops ovulating and menstruating and can no longer conceive a child; it is generally considered to have occurred 1 year after the last menstrual period. A study conducted with women from 36 different countries indicated menopause happens, on average, at about age 49 with a range of 46 to 52 years. Generally, women in Africa, Latin America, Asian, and Middle Eastern countries tend to be younger when they experience menopause, and women from Europe, Australia, and the United States are slightly older (Monteleone et al., 2018).

Menopause is not a single event; it is a process called the menopausal transition. It begins with **perimenopause**, also known as the climacteric. During this time, a woman's production of mature ova begins to decline, and the ovaries produce less estrogen. Menstruation becomes less regular, with less flow than before, and there is a longer time between menstrual periods. Eventually, menstruation ceases altogether. The menopausal transition generally begins in the midthirties to midforties and can take approximately 3 to 5 years.

**Symptoms** Most women experience some symptoms during the menopausal transition. Some have no symptoms at all, and racial/ethnic variations exist (see Box 1).

Most commonly reported are hot flashes and night sweats, sudden sensations of heat that flash through the body due to erratic changes in hormone secretion that affect the temperature control centers in the brain. Hot flashes are associated with anxiety, depression, and an increased risk for heart disease (Fu et al., 2018; Thurston et al., 2017). They are experienced by up to 80 percent of menopausal women and are the most common reason for which women seek medical attention related to menopause. The average duration of symptoms is over 5 years, although African American women, highly stressed women, and women of low educational status may experience them for longer (Col et al., 2009; Avis et al., 2015).

#### BOX 1 Symptoms of Menopause and Aging

- Hot flashes, night sweats
- Vaginal dryness, painful intercourse
- Sleep disturbances
- Mood disturbances (depression, anxiety, irritability)
- Urinary incontinence
- Cognitive disturbances (e.g., forgetfulness)
- Somatic symptoms (back pain, tiredness, stiff or painful joints)
- Sexual dysfunction

Source: National Institute on Aging (2021).

## CULTURAL DIFFERENCES IN MENOPAUSE

Many women accept hot flashes, night sweats, and mood disturbances as normal accompaniments of menopause. Yet women in some cultures rarely or never experience these symptoms. The reasons for the cultural differences are complex and include genetic differences, diet and lifestyle differences, and perceptual differences about aging and what menopause means within the culture (Scheid, 2007).

Attitudes toward menopause vary greatly across cultures. Aging is less feared in the East than the West; it is often seen as a welcome event, bringing respect as an elder and newfound freedom from reproduction and taboos of uncleanness. In many Asian cultures, such as Japan, Singapore, Taiwan, and China, there are no specific terms for “hot flash,” although people recognize that there are changes and distinctions among body states. Muscle and joint pains are often reported but are not often interpreted as being related to menopause (Scheid, 2007). In some cultures, such as that of Mayan women in Mexico or the indigenous women in Australia, menopausal symptoms are rare, with many noting only the cessation of menses (Jones et al., 2012).

This may be why reported prevalence rates vary across cultures. For instance, women from the United States, United Kingdom, and Canada report more numerous and severe menopause symptoms than women from other European countries, whereas women from

Sweden and Italy report the fewest (Minkin et al., 2015). Previous research indicated that American and Canadian samples also reported more symptoms than Japanese samples (Lock, 1993), although recent data cast doubt upon whether or not this is still the case (Mueck & Ruan, 2017; Islam et al., 2017).

Even within the United States itself, different racial and ethnic groups experience menopause differently. For instance, whereas 75 percent of women experience some hot flashes, the prevalence varies widely. The prevalence of hot flashes is 18 percent in Japanese Americans, 21 percent in Chinese Americans, 35 percent in Hispanic Americans, 46 percent in African Americans, and 53 percent in Caucasian women (Tepper et al., 2016).

Research shows that this universal biological event has major variations. A woman’s perceptions about menopause as well as her diet, her overall health, her activity levels, and her culture all play a role in her experiences with menopausal symptoms.



What do you think might explain cultural differences in women's experience of menopause? What is a greater influence—changing biology or beliefs about aging—and why?

Women experiencing menopause also report sleep disturbances. In particular, 40 to 60 percent of women complain of nocturnal awakenings. Depression and anxiety are also common, and menopausal women are at higher risk than are premenopausal women, especially if they have previously experienced mental illness. Women also report cognitive changes, including declines in memory and concentration and an increased prevalence of migraines. Last, many women report weight gain, although this is likely a function of age rather than menopause per se (Monteleone et al., 2018).

Up to 57 percent of postmenopausal women experience vaginal dryness and about half experience thinning of the vaginal walls, both of which have the potential to make intercourse painful. Water-soluble lubricants may help relieve this problem (Edwards & Panay, 2016). Sexual issues can also be alleviated with marital therapy for postmenopausal women and their partners (Tiznobeck et al., 2017). In addition, some women of menopausal age may experience mood disturbances, such as irritability, nervousness, tension, and depression (Gracia & Freeman, 2018; National Institutes of Health, 2005). Some of the symptoms of menopause may reflect societal views of women and aging (see Window on the World).



*Women of menopausal age report many different symptoms. Physical exercise may alleviate some of them.*

Ty Milford/Aurora Open/Getty Images

**Changes in Male Sexual Functioning** Starting at about age 30 in males, testosterone levels begin to decline at a rate of about 1 percent a year, although there are wide individual variations (Asthana et al., 2004; Lewis et al., 2006). Although men can still father children, sperm count declines with age. Moreover, the genetic quality of their sperm declines as well, and advanced paternal age has been implicated as a source of birth defects (Almeida et al., 2017; Yatsenko & Turek, 2018).

#### erectile dysfunction

Inability of a man to achieve or maintain an erect penis sufficient for satisfactory sexual performance.

Some middle-aged and older men experience erectile dysfunction (ED; commonly called impotence). **Erectile dysfunction** is defined as a persistent inability to achieve or maintain an erect enough penis for satisfactory sexual performance. A recent review of international studies on ED found widely divergent estimates across different countries; however, all countries showed increases in ED with age. Overall, in men younger than 40 years, the prevalence rates were from 1 to 10 percent. By the seventies and eighties however, nearly all countries showed prevalence rates from 50 to 100 percent (McCabe et al., 2016). In the United States, approximately 61 percent of 40- to 69-year-olds and more than 77 percent of men over the age of 70 have ED (Wagle et al., 2012).

Diabetes, obesity, hypertension, high cholesterol, depression, neurological disorders, and many chronic diseases have been implicated in ED. In addition, alcohol and drug use, as well as smoking, may contribute. Poor sexual techniques, lack of knowledge, unsatisfying relationships, anxiety, and stress may be contributing factors as well (Rosen & Kupelian, 2016; Sartorius et al., 2012). Treatment guidelines state that clinicians should first counsel men to institute lifestyle modifications to improve health, which then may also improve ED. If this is ineffective, then Sildenafil (Viagra) and other similar testosterone therapies can be prescribed (Burnett et al., 2018). If there is no apparent physical problem, psychotherapy or sex therapy (with the support and involvement of the partner) may help (National Institutes of Health, 1992).

Testosterone replacement therapies (TRT) are sometimes used to address declining testosterone levels in men. There is some evidence that men with testosterone levels clearly below average may benefit from testosterone therapy; however, the data are less certain for those men whose testosterone shows the typical age-related drop (Corona et al., 2014; Lewis et al., 2006; Whitbourne, 2001). Still, some studies have shown benefits of TRT's use among middle-aged men in terms of improved sexual function (Corona et al., 2017), decreased frequency of nighttime urination, better sleep quality (Shigehara et al., 2015), and reduced body fat (Fui et al., 2016). However, TRT may significantly increase the risk for cardiovascular events, stroke, or early death (Garnick, 2015; Anderson et al., 2015).

### checkpoint can you ...

- ▶ Contrast men's and women's reproductive changes at midlife?
- ▶ Identify factors that can affect women's experience of menopause?
- ▶ Tell which reported symptoms have been found to be related to menopause and which have not?
- ▶ Identify changes in male sexual functioning in middle age?
- ▶ Discuss changes in sexual activity during middle age?

**Sexual Activity** The single most important factor determining sexual activity in midlife for women is the presence of a partner. Married and cohabitating women have a roughly 8 times higher chance of being sexually active. From the ages of 40 to 49, almost 75 percent of women who lived by themselves had sex in the previous 6 months, whereas nearly 90 percent of married or cohabitating women did, and at 50 to 59 years, 67.7 percent of women living alone had sex in the previous 6 months, whereas almost 87 percent of married and cohabitating women did (Thomas et al., 2015).

Health is also important, and good health has been repeatedly associated with sexual activity and satisfaction (Thomas et al., 2015; Fisher et al., 2015). Menopause matters as well; 61 percent of married or cohabiting premenopausal women but only 41 percent of postmenopausal women reported having sex once a week or more (Rossi, 2004), and hot flashes are associated with declines in sexual activity (Thomas et al., 2015). Other factors such as surgery, medications, and too much food or alcohol can also impact sexual activity (Rossi, 2004).

Nonphysiological issues also impact sexual activity. For example, body image can influence the desire to have sex. Women who feel confident about their bodies and are high in self-acceptance tend to have higher levels of sexual satisfaction, whereas those who are self-conscious about their appearance are more likely to report declines (Thomas et al., 2018). A couple's relationship quality is important too. When a couple communicates well, kisses and cuddles frequently, and is physically tender, this is associated with greater sexual satisfaction. Importantly, couples who can communicate about sexual

activity and preferences, who care about each other's pleasure, and who desire approximately the same amount of sexual activity also tend to be more satisfied (Thomas et al., 2018; Fisher et al., 2015; Freak-Poli et al., 2017; Gillespie, 2017).

# Physical and Mental Health

Most middle-age Americans, like middle-age people in other industrialized countries, are generally healthy. In this section, we address issues related to health at midlife.

## PHYSICAL HEALTH AT MIDLIFE

**Hypertension** (chronically high blood pressure) is the world's leading preventable cause of early death. Approximately 1.13 billion people worldwide have hypertension, although the prevalence rates vary by region. The highest rates are found in Africa (27 percent) and the lowest rates in the Americas (18 percent), with men more likely to be affected than women (World Health Organization, 2021). In high-income countries, rates decreased by 2.6 percent from 2000 to 2010, presumably as a result of better diagnosis and treatment. By contrast, low- and middle-income countries showed an increase of 7.7 percent (Mills et al., 2016). These high rates are troubling given hypertension's status as a risk factor for cardiovascular disease and stroke (Forouzanfar et al., 2015). These two diseases are the leading causes of global death, and estimates are that 1 in 4 deaths can be attributed to them (Abubakar et al., 2015).

In the United States in 2016, 37.2 percent of men and 29.4 percent of women age 40 to 59 had high blood pressure, with the highest rates found in African American men and women (Fryar et al., 2017). Some adults can lower their blood pressure with lifestyle modifications, such as weight loss, increases in physical activity, eating a low-salt diet with plentiful fruits and vegetables, increasing potassium intake, and consuming light amounts of alcohol. If lifestyle modifications are not effective, medication is generally used as well (Frisoli et al., 2011).

Globally, heart disease is the leading cause of death, accounting for 32 percent of deaths. Most of these deaths occur in low- to middle-income countries where access to health care services is limited (World Health Organization, 2021). In the United States, heart disease is the leading cause of death between age 45 and 64 (Centers for Disease Control and Prevention, 2019, 2019). Overall, heart disease and its associated death rates have been on a long-term decline, although progress seemed to stall in 2011 (Sidney et al., 2016), perhaps due to rising rates of obesity and diabetes (Sidney et al., 2017). As with hypertension, African Americans are at higher risk (National Center for Health Statistics, 2021). Although women are less likely to have or die from heart disease when younger, as they age, their risk rises to meet that of men. Moreover, because they often present with atypical symptoms and are treated less aggressively, all else being equal, their outcomes are generally worse than men's (Khamis et al., 2016). For example, chest pain is the most common symptom of a heart attack in both men and women, but women may experience other symptoms, such as back and jaw pain, nausea and vomiting, indigestion, difficult breathing, or palpitations (Patel et al., 2004).

In 1980, global prevalence of **diabetes** was 108 million. By 2014, this number had more than quadrupled to 422 million, with rates rising more quickly in low- to middle-income countries (World Health Organization, 2021). In the United States, approximately 17.5 percent of adults—about 15 million people—age 45 to 64 have diabetes, although roughly 3.6 million are undiagnosed. The rates are highest for Native American/Alaska Natives, Hispanics, and African Americans. Prevalence rates, which have been rising, are higher for people from lower socioeconomic levels (Centers for Disease Control and Prevention, 2020). The most common type, mature-onset (type 2) diabetes, typically develops after age 30 and becomes more prevalent with age. People with mature-onset diabetes often do not realize they have it until they develop such serious complications as heart disease, stroke, blindness, kidney disease, or loss of limbs (American Diabetes Association, 1992).



Sleep is also important for health. Poor sleep quality is associated with an increased risk of heart disease and high blood pressure (Brindle et al., 2019).

### hypertension

Chronically high blood pressure.

### diabetes

(1) One of the most common diseases of childhood. It is characterized by high levels of glucose in the blood as a result of defective insulin production, ineffective insulin action, or both. (2) Disease in which the body does not produce or properly use insulin, a hormone that converts sugar, starches, and other foods into energy needed for daily life.

COVID-19, which did not exist prior to 2018, became the third leading cause of death in the United States in 2020 (Centers for Disease Control and Prevention, 2022). The risk of death from COVID-19 increases with age. Moreover, many of the chronic diseases and conditions common at midlife confer an added risk to those adults who become infected with COVID-19. For example, obesity, cardiovascular disease, diabetes, chronic respiratory disease, cancer, and hypertension are associated with an increased risk of death from COVID-19 (Jordan et al., 2020). Thus, it is perhaps not surprising that death rates for middle-aged adults increased in 2020. Adults age 35 to 44 years had a death rate increase of 24.5 percent, and adults age 45 to 54 had an increase of 20.7 percent (Centers for Disease Control and Prevention, 2022), primarily driven by COVID-19 (Ortala et al., 2021).

Some adults infected with COVID-19 survive the infection but continue to experience symptoms for an extended period of time. Survivors with post-acute sequelae of COVID, commonly known as long COVID, report extended fatigue, headache, shortness of breath, and loss of smell and taste. Women, older adults, and overweight adults are at higher risk (Sudre et al., 2021). Given how new the disease is, information is limited. However, a recent review of data from 17 countries suggests long COVID will be experienced by over 40 percent of infected people and in over half of hospitalized cases (Chen et al., 2021).

## BEHAVIORAL INFLUENCES ON HEALTH

When drinking from champagne glasses, people take smaller sips and drink more slowly than do those using martini glasses (Langfield et al., 2020).



On average, Americans who smoke, are overweight, and have high blood pressure and high blood sugar have a life expectancy 4 years less than those who do not (Danaei et al., 2010). By the same token, people who do not smoke, who exercise regularly, drink alcohol in moderation, and eat plenty of fruits and vegetables have 4 times less risk of dying in midlife and old age (Khaw et al., 2008).

Weight in particular seems to affect health. Excess weight in middle age increases the risk of impaired health and death (Nejat et al., 2010), even in healthy people (Yan et al., 2006) and for those who have never smoked (Adams et al., 2006). Obesity, defined as a BMI of 30 or more, is an even greater risk and is associated with even greater mortality (Flegal et al., 2013). Moreover, overweight and obese adults are at elevated risk for death from COVID-19 (Poly et al., 2021). Weight also interacts with ethnicity, making some ethnic groups more likely to become overweight or obese. African American adults are the most likely to be obese (49.6 percent), followed by Hispanic adults (44.8 percent) and White adults (42.2 percent). Asian Americans are the least likely to be obese (17.4 percent). The prevalence of severe obesity, with a BMI of 40 or higher, is greater in adults age 40 to 59 than in any other age group (Hales et al., 2020).

Physical activity in midlife is an important protective factor, particularly given that declines in cardiovascular fitness are steep after age 45 (Jackson et al., 2009). Physical activity in midlife can help aging adults retain their muscle tone and strength (Akune et al., 2014), increase the chances of remaining mobile in old age (Patel et al., 2006), avoid weight gain (Jakicic et al., 2019), and stay healthier longer (Rhodes et al., 2017). Moreover, physical activity is associated with better cognitive functioning at midlife (Hoang et al., 2016) and a decreased risk of dementia in late adulthood (Blondell et al., 2014; Tolppanen et al., 2015). Unfortunately, research suggests that the average person engages in about a half hour less of physical activity per day over the span of 10 years from early adulthood to midlife, replacing previously active time with sedentary activity (Pettee Gabriel et al., 2018), and only 22.9 percent of adults meet physical activity guidelines (Blackwell & Clarke, 2018).

Approximately 52 percent of adults age 35 to 49 years eat a poor diet, as defined by less than 40 percent adherence to dietary guidelines, and this number is higher in Hispanics and African Americans. Education matters as well; greater adherence with dietary guidelines is found in more educated groups (Rehm et al., 2016). Although rates have decreased, slightly over 16 percent of adults age 45 to 64 smoke (Creamer et al., 2019). Last, although vaccinations confer significant protection against serious illness and death,

as of December 2021, 19 percent of adults age 40 to 54 years remained unvaccinated (US Census Bureau, 2021).

## SOCIOECONOMIC STATUS AND HEALTH

People with low socioeconomic status tend to have poorer health, shorter life expectancy, more activity limitations due to chronic disease, and lower well-being than people with higher SES. In part, this is due to the cost of health care. In 2018, 41.3 percent of poor and near-poor people either delayed or did not receive medical care because of its expense (National Center for Health Statistics, 2018).

The reasons for the connection between SES and health may also be psychosocial. People with low SES tend to live in more stressful environments and report higher levels of perceived stress. These higher levels of stress, in turn, are associated with a greater likelihood of engaging in unhealthy behaviors, such as consuming a poor diet, smoking, and not exercising (Algren et al., 2018). People with higher SES, by contrast, experience less stress and have a greater sense of control over what happens to them, attenuating their stress response (Mooney et al., 2016). They also tend to choose healthier lifestyles and to seek medical attention and social support when they need it (Lachman & Firth, 2004; Marmot & Fuhrer, 2004). Moreover, they tend to show higher compliance with lifestyle modifications recommended to improve health indices (Wright et al., 2009).

However, there are wide individual differences in health among low-SES adults. Protective influences include the quality of social relationships and the level of religious engagement from childhood on (Ryff et al., 2004). Negative influences include loneliness, which has a negative effect on both mental and physical well-being and is a risk factor for poor health and mortality (Cacioppo & Cacioppo, 2014).



*Research suggests that regular church attendance is related to decreases in the risk of death and increases in health. Some of these influences appear to be indirect—for example, those who attend church frequently are less likely to abuse alcohol and smoke—but others may be direct—those who attend church regularly show higher subjective well-being (Koenig & Valliant, 2009). In other words, they just plain feel better.*

## RACE/ETHNICITY AND HEALTH

Even though racial and ethnic disparities in health have decreased in the United States since 1990, substantial differences persist (National Center for Health Statistics, 2018). In trying to determine the cause, researchers have looked to the human genome. Research in this area has found distinctive variations in the DNA code among people of European, African, and Chinese ancestry (Hinds et al., 2005). These variations are linked to predispositions to various diseases, from cancer to obesity, and such data may ultimately open the way to targeted treatments of preventive measures (Antonarakis & Cooper, 2019).

By far, the most research has focused on correlates of ethnicity and how those might be related to differences in health. People who live in poverty generally have poorer access to health care, more stressful lives, and greater exposure to potential toxins in their everyday environment (Smedley & Smedley, 2005). Moreover, people of different races may have differential responses to poverty. Some data suggest, for example, that the health of African Americans is more affected by poverty than that of White adults (Mode et al., 2016; Rodriguez et al., 2019).

There are other differences between people of different ethnicities. From young adulthood throughout middle age, African Americans have higher overall death rates and higher incidence of hypertension, obesity, and diabetes (National Center for Health Statistics, 2018). Given the strong relationship between race and socioeconomic status in the United States, many of these health disparities are attributable to the effects of poverty. For African Americans, for example, poverty has been related to poor nutrition, substandard housing, and poor access to health care (Smedley & Smedley, 2005). Hispanic Americans, like African Americans, have a disproportionate incidence of stroke, liver disease, diabetes, HIV infection, homicide, and cancers of the cervix and stomach (National Center for Health Statistics, 2016). They are also much less likely, particularly if they have limited English proficiency, to have health insurance and a regular source of health care (Martorell & Martorell, 2006). In 2017, Hispanics had the lowest rates of

## checkpoint can you ...

- Describe the typical health status in middle age, and identify health concerns that become more prevalent at this time?
- Discuss behavioral, socioeconomic, and racial/ethnic factors in health and mortality at middle age?



*Women's greater longevity has been attributed to genetic protection given by the second X chromosome (which men do not have) and, before menopause, to beneficial effects of the female hormone estrogen, particularly on cardiovascular health.*

Dave and Les Jacobs/Blend Images LLC

Can you get up off the floor without using your hands or knees? The sitting-rising test (SRT) is a quick and easy way to assess muscle strength, flexibility, balance, and body composition.

Performance on the SRT has been repeatedly associated with all-cause mortality (DeBrito et al., 2014).



health care coverage (83.9 percent) compared to African American (89.4 percent), Asian (92.7 percent), and non-Hispanic White (93.7 percent) individuals (Berchick et al., 2018).

Even when BIPOC have high socioeconomic status, racial disparities in health still exist. One factor that has been identified as a potential causal influence is the additive effects of discrimination, racism, and social inequality. The added burden of these factors over a lifetime can result in an accumulating strain on the body with consequent negative effects on health and wellness (Colen et al., 2018; Williams et al., 2016).

### GENDER AND HEALTH

Women have a higher life expectancy than men and lower death rates throughout life (Murphy et al., 2021; World Health Organization, 2019). This has not always been the case. It is likely that for much of human history, men and women had similar life spans. However, improvements in maternal mortality rates and reductions in infectious diseases more greatly impacted women's mortality than men's (Warrainch & Califf, 2019; Goldin & Lleras-Muney, 2019). Women's greater longevity has also been attributed to genetic

protection given by the second X chromosome (which men do not have) and, before menopause, to the beneficial effects of the female hormone estrogen on both cardiovascular and cognitive health (World Health Organization, 2019; Hara et al., 2015). However, psychosocial and cultural factors, such as men's greater propensity for risk-taking, also played a part (Mahalik et al., 2013; Courtenay, 2011).

Although women live longer, they are slightly more likely to report being in fair or poor health than men (National Center for Health Statistics, 2018). Middle-age women tend to report more specific symptoms and chronic conditions than men, and they devote more effort to maintaining their health (Cleary et al., 2004). Men may feel that admitting illness is not masculine and seeking help means a loss of control (Addis & Mahalik, 2003; Seidler et al., 2016), and they are less likely to seek professional help for health problems or stay overnight in a hospital (National Center for Health Statistics, 2018). They are also more likely to suffer from chronic health problems such as cancer or high blood pressure (Siegel et al., 2015; Maranon & Reckelhoff, 2013) and to report drug or alcohol problems (Cleary et al., 2004). Men are also more likely to report limitations in daily living as the result of a chronic condition (13.4 percent) than are women (12.4 percent) (National Center for Health Statistics, 2018).

With longer life spans, women in many developed countries now can expect to live half their adult lives after menopause, during which time they are at increased risk for osteoporosis, breast cancer, and heart disease. As a result, increasing attention is being paid to women's health issues at this time of life (Barrett-Connor et al., 2002). There has also been more awareness of men's health issues as well. For example, as they age, men face an increasing risk of erectile dysfunction, particularly if their health is already poor (Gupta et al., 2011).

For many years, older men were subject to aggressive screening procedures for prostate cancer. Sometimes small cancers would be discovered, and many men were treated for those cancers. However, given the slow growth of prostate cancer, it is likely that many of these growths would never have become dangerous. Thus, new recommendations were recently developed to reduce the emphasis on aggressive screening procedures with the goal of reducing unnecessary medical treatment. Now, unless men meet one of a number of particular risk factors, prostate screening is not always recommended (Moyer, 2012; Heidenreich et al., 2011).

**Bone Loss and Osteoporosis** Most people reach peak bone mass—the greatest amount of bone they can attain—in the late teens and early 20s. Bone health is maintained by an active lifestyle, adequate vitamin D, calcium-rich foods, and an active lifestyle (Bone Health and Osteoporosis Foundation, 2022).

In women, bone loss rapidly accelerates in the first 5 to 10 years after menopause as levels of estrogen, which helps in calcium absorption, fall. Extreme bone loss may

lead to **osteoporosis** (“porous bones”), a condition in which the bones become thin and brittle as a result of calcium depletion. Common signs of osteoporosis are marked loss in height and a hunched posture that results from compression and collapse of a weakened spinal column. A recent review of 86 studies across the United States, Europe, Asia, Africa, and Australia estimated the prevalence of osteoporosis to be 18.3 percent of adult, with women (23.1 percent) more likely to report osteoporosis than men (11.7 percent) (Salari et al., 2021).

Osteoporosis is more common in White women, most often in those with a small frame, low weight and BMI, and a family history of the condition. Other risk factors, besides age, include smoking, lack of exercise, and alcohol use (Centers for Disease Control and Prevention, 2020; Looker et al., 2017; Johansson et al., 2014). A predisposition to osteoporosis seems to have a genetic basis, particularly as there are indications that genetic markers may have implications for which drugs will be most effective in an individual (Richards et al., 2012).

In 2017, the American College of Physicians (ACP) released new, evidence-based guidelines for the treatment and management of osteoporosis in both men and women (Qaseem et al., 2017). Strong recommendations included the use of bisphosphonates (drugs that slow or prevent bone loss) such as alendronate, risedronate, zoledronic acid, or denosumab in women who have been diagnosed with osteoporosis. These medications reduce the risk of hip or vertebral fractures in women, but the evidence for their effectiveness in men is weaker. In contrast to earlier recommendations, the ACP strongly recommends hormone therapy not be used for treating osteoporosis in women, as new evidence does not show it to be effective. The ACP also recommends bisphosphonate therapy for 5 years; however, bone density monitoring does not appear to confer any additional benefits to patients and is not necessary. Last, the ACP recommends that treatment decisions be holistic and take into account patient preferences and profile, and the financial and medical costs and benefits of medications.

Good lifestyle habits can reduce risk, especially if started early in life. Longitudinal studies suggest that exercise can help slow bone density loss (Kemmler et al., 2015). While some researchers have argued the data on exercise are inconclusive (Qaseem et al., 2017), others have pointed out that the benefits of exercise are promising and extend even further than bone health. For example, staying active can maintain strength, agility, and balance, and can thus be protective against falls that often lead to broken bones in older adults. Older adults also benefit from proper nutrition and the avoidance of smoking or heavy drinking (Cosman et al., 2014).

**Breast Cancer and Mammography** Breast cancer most commonly occurs in the lobules (the glands that produce milk) and ducts (the tubes carrying milk to the nipples) of women’s breasts. Although it is rare, breast cancer can also appear in men. Many people have no symptoms, although common warning signs include lumps in the breast or underarm, thickness, swelling, irritation, dimpling, or flaky skin on the breast, nipple pain or discharge other than milk, and any change in size or shape of the breast (Centers for Disease Control and Prevention, 2021).

Breast cancer is almost nonexistent in younger cohorts but begins to be diagnosed with increasing frequency starting in midlife.(Centers for Disease Control and Prevention, 2021). In 2020, 2.3 million women were diagnosed with breast cancer and 685,000 died, making it the most common cancer worldwide (World Health Organization, 2021). In the United States, breast cancer is the second most common cancer. Approximately 257,000 Americans are diagnosed

#### osteoporosis

Condition in which the bones become thin and brittle as a result of rapid calcium depletion.



Images of normal (top) and osteoporotic (bottom) bones.

(top) Steve Gschmeissner/Science Photo Library/Brand X Pictures/Getty Images

(bottom) Steve Gschmeissner/Science Photo Library/ Getty Images



Routine mammography to screen for breast cancer is generally recommended for older women. If cancer is detected before it spreads, women have about a 98 percent chance of surviving at least 5 years after diagnosis.

Rhoda Baer/National Cancer Institute (NCI)

with it every year, and about 42,500 die (Centers for Disease Control and Prevention, 2021). One in 8 American women will develop breast cancer at some point in her life (American Cancer Society, 2017).

About 5 to 10 percent of breast cancer cases are thought to be hereditary, resulting from inherited mutations. The most common of these are mutations of the BRCA1 and BRCA2 genes. Women without these mutations have roughly a 10 percent chance of developing breast cancer. However, those who have a BRCA1 or BRCA2 mutation have as much as a 70 percent chance of developing breast cancer (American Cancer Society, 2017).

However, the vast majority of breast cancer cases are environmentally influenced. Once found mostly in affluent countries, breast cancer is becoming a worldwide problem as Western lifestyles move into the developing world (Porter, 2008). Overweight women, those who drink alcohol, those who experience early menarche and late menopause, those with a family history of breast cancer, and those who have no children, did not breastfeed, or who bore children later in life have a greater risk of breast cancer, whereas those who are moderately physically active and eat low-fat, high-fiber diets are at less risk (American Cancer Society, 2017; Centers for Disease Control and Prevention, 2021). Weight gain, especially after menopause, increases a woman's risk of breast cancer, and weight loss decreases the risk (Eliassen et al., 2006).

Advances in treatment and early diagnosis have dramatically improved prospects for breast cancer patients. Fully 89 percent of US women with breast cancer now survive at least 5 years past diagnosis. If the cancer is still localized and has not yet spread, the 5-year survival rate is 99 percent (Miller et al., 2016). Cancer can be treated with removal of part or all of the breast, along with radiation or chemotherapy.

The benefits of **mammography**, diagnostic X-ray examination of the breasts, appear to be greatest for women over 50. In 2009, the US Preventive Services Task Force issued a new set of guidelines recommending that women begin routine screening for breast cancer at 50, rather than at 40 years of age as had been previously suggested. However, adherence to this diagnostic schedule varies, and medical professionals and organizations often disagree with recommended diagnostic guidelines (Corbelli et al., 2014).

#### **mammography**

Diagnostic X-ray examination of the breasts.

#### **hormone therapy (HT)**

Treatment with artificial estrogen, sometimes in combination with the hormone progesterone, to relieve or prevent symptoms caused by decline in estrogen levels after menopause.

**Hormone Therapy** The most troublesome physical effects of menopause are linked to reduced levels of estrogen, and **hormone therapy (HT)** has been used to address these effects. HT is treatment with artificial estrogen, sometimes in combination with progesterone, to help relieve symptoms of menopause. HT has a complicated pattern of risks and benefits.

On the positive side, HT is the most effective means of addressing symptoms such as night sweats and hot flashes, especially for women below the age of 60 or who went through menopause less than 10 years ago (De Villiers et al., 2013). However, it is not as effective at managing osteoporosis. HT, when started at menopause and continued for at least 5 years, does slow bone loss after menopause (Barrett-Connor et al., 2002; Lindsay et al., 2002). However, bone loss resumes within 3 years if and when HT stops (Heiss et al., 2008). Moreover, HT fails to reduce the risk of fracture (Reid, 2014).

While earlier research was equivocal, the most recent research suggests that HT does not impact the risk of either cardiovascular disease or mortality (Manson et al., 2017; Benkhadra et al., 2015). Because of the complicated risk profile of these drugs, HT should not be used for disease prevention but is appropriate for menopausal symptom management in affected women (Manson et al., 2013). If HT is to be used, it should be at the lowest dose possible, and women using HT should undergo a yearly health assessment (Baber et al., 2016). Lifestyle changes such as losing weight and stopping smoking, together with any necessary drugs to lower cholesterol and blood pressure, appear to be wiser courses for disease prevention in most women (Manson & Martin, 2001). HT, especially when taken orally, has also been associated with a greater, although still overall small, risk of stroke or blood clot (De Villiers et al., 2013).

As with the cardiac data, the links between HR and breast cancer risk are complex. Heightened risk of breast cancer seems to occur mainly among current or recent estro-

gen users, if estrogen and progestin are used together, and the risk increases with length of use (Chen et al., 2002; De Villiers et al., 2013). However, the overall risk is still quite low, with an incidence of less than 1 woman per 1,000 over a year. This risk is comparable to increased risk due to lifestyle factors such as being sedentary or consuming alcohol (De Villiers et al., 2013).

Results on the effects of HT on cognitive function and dementia risk are also difficult to interpret. Some studies have found that HT reduces the risk of cognitive impairment (Zandi et al., 2002), whereas others have found it increases the risk (Espeland et al., 2004; Shumaker et al., 2004). Timing may matter here. HT that begins in early menopause does not seem to have a negative effect on cognition; however, later initiation of HT is associated with increased risk of dementia (De Villiers et al., 2013). Additional research in this area indicates that when women use HT in midlife *only*, they show a lower risk of dementia than women who use HT in early menopause and continue to do so into late adulthood and than women who begin using HT in late adulthood. It may be there is a critical window of time where HT is protective, but taken outside of that window, it is damaging (Whitmer et al., 2011; Shao et al., 2012).

Because of the risks associated with the use of HT, many women prefer not to use it. In this event, selective serotonin reuptake inhibitors—typically taken for depression—may be used (De Villiers et al., 2016). The antihypertensive clonidine, the anticonvulsive drug gabapentin, and soy isoflavones (a class of phytoestrogens found in legumes and beans) have also been found to be somewhat effective (Li et al., 2016).

## checkpoint can you . . .

- Discuss changes in women's health risks after menopause, and weigh the risks and benefits of hormone therapy?

## MENTAL HEALTH AT MIDLIFE

In 2019, approximately 25.3 million US adults age 26 to 49 had some form of mental, behavioral, or emotional disorder that met DSM-IV criteria in the past year (excluding developmental disorders and substance use disorders). Of those, 8.9 million had a major depressive episode, and slightly under 69 percent of them received treatment for it (Substance Abuse and Mental Health Services Administration, 2018). Depression negatively affects health, making prevention and treatment an important issue. Adults with depression are more likely than their peers to be diagnosed with heart disease, arthritis, or stroke and to report needing help with activities of daily living such as bathing and dressing (Hare et al., 2014; Matcham et al., 2016; Dong et al., 2012; Pratt et al., 2007).

Even those adults not diagnosed with a mental disorder may experience negative effects at a subclinical level. For example, when asked about the presence of mental health-related symptoms in the past month, 53 percent of adults said they were restless, and 52 percent reported feeling so tired they could not do anything. Additionally, nearly half of adults report negative effects on their behaviors, including increased tension (21 percent), irritability and anger-proneness (20 percent), mood swings (20 percent), or yelling at a loved one (17 percent). Moreover, nearly 1 in 5 respondents said their mental health was worse in 2020 than in the previous year (American Psychological Association, 2021).

**Stress** Stress is the damage that occurs when perceived environmental demands, or **stressors**, exceed a person's capacity to cope with them. The body's capacity to adapt to stress involves the brain, which perceives danger (either real or imagined); the adrenal glands, which mobilize the body to fight it; and the immune system, which provides the defenses.

Prior to 2020, common sources of reported stress for American adults included health, work and money, personal debt, housing instability, and hunger. The largest source of stress, reported by 71 percent of adults, was mass shootings (American Psychological Association, 2020). However, the advent of the COVID-19 pandemic shifted the sources of stress for most Americans. In 2020, COVID-19 and its associated effects became a primary source of stress for many Americans, and 78 percent of adults cited COVID-19 as a significant source of stress in their lives. The effects of the pandemic were also felt more strongly by adults with children. Forty-six percent of adults with

### stress

(1) Physical or psychological demands on a person or organism. (2) Response to physical or psychological demands.

### stressors

Perceived environmental demands that may produce stress.

*People who chew gum on a regular basis report being less stressed than those who do not (Smith, 2009).*



*Rather than fight or flight, women are more likely to tend and befriend as a way of dealing with stress.*

BananaStock/Alamy Stock Photo

*Stress can make you lose your hair by triggering the hair follicles to stop growing prematurely in a condition called telogen effluvium. Fortunately, once the stressor is gone, the effects are generally reversible (Malkud, 2015).*



children reported their average stress level as high, whereas only 28 percent of adults without children reported the same (American Psychological Association, 2022).

In April 2020, unemployment rose to almost 15 percent, reflecting job losses for over 23 million people (US Bureau of Labor Statistics, 2020). Not surprisingly, the stress reported due to work and the economy increased sharply from the previous year, from 46 to 63 percent of adults, and increases were most striking in adults earning less than \$50,000 a year (American Psychological Association, 2021).

Discrimination is also problematic, and concerns in this area differ by race and ethnicity. African American adults (48 percent), Hispanics (43 percent), and Native Americans (41 percent) report discrimination to be a source of stress at higher levels than White or Asian Americans (25 percent). Regardless of race, the majority of adults (58 percent) report police violence toward minorities to be a significant source of stress in their lives (American Psychological Association, 2021).

**Stress and Health** The stress response system and the immune system are closely linked and work together to keep the body healthy. Acute, or short-term, stress, such as the challenge of taking a test or running a competitive race, generally strengthens the immune system. We are adapted to dealing with such events, and our bodies quickly and efficiently respond to and then recover from the event. However, intense or prolonged stress, such as might result from poverty or disability, can weaken or break down the body, increasing the susceptibility to disease (Segerstrom & Miller, 2004; Sapolsky, 1992).

Chronic stress can lead to persistent inflammation and, over time, to disease (Cohen et al., 2012). Stress has been increasingly recognized as a factor in age-related diseases, including hypertension, heart disease, stroke, osteoporosis, peptic ulcers, and cancer (Liu et al., 2017; Wirtz & von Kanel, 2017; Kotlega et al., 2016; Kelly et al., 2019; Deding et al., 2016; Moreno-Smith et al., 2010). Moreover, a propensity to respond in a nega-

tive fashion to stress may interact with genetic predispositions. So, even if similar stressors are experienced, some people respond more negatively than others. Daily stressors such as irritations, frustrations, and overloads may be less severe in their impact than life changes, but their buildup can also affect health and emotional adjustment, particularly for emotionally reactive adults (Piazza et al., 2013). For minority-group members, discrimination and racism can also lead to increased chronic stress and are associated with an increased risk for disease (Thoits, 2010).

**Emotions and Health** An ancient proverb of Solomon, “A merry heart doeth good like medicine” (Proverbs 17:22), is being borne out by contemporary research. Because the brain interacts with all of the body’s biological systems, feelings and beliefs affect bodily functions, including the functioning of the immune system.

Although negative emotions are unpleasant to experience, under the right circumstances they are a healthy response to events and serve important adaptive functions. For example, when negative emotions are elicited in negative contexts, they can have beneficial consequences, such as when fear motivates an individual to schedule a screening for a disease (Coifman et al., 2016). However, when negative moods are excessive, long-lasting, or occur too frequently, they can have damaging effects on the body, suppress immune functioning, and increase susceptibility to disease. For instance, people who tended to stay upset a day after a stressor were, a decade later, more likely to have chronic health conditions and worse functional limitations than people who were able to move on from stressors more rapidly (Leger et al., 2018).

## checkpoint can you ...

- Discuss causes and effects of stress and sources of stress in middle age?
- Explain how stress affects health?

Negative emotions, such as anxiety and despair, are often associated with poor physical and mental health (Ray, 2004; Salovey et al., 2000; Spiro, 2001). People high in neuroticism and hostility, who are prone to such feelings on a regular basis, are more likely to suffer from serious illness and reduced longevity. Hostility has also been associated with an increased risk of coronary heart disease and mortality for postmenopausal women (Lahey, 2009; Smith, 2006; Tindle et al., 2009) and with an increased risk of death from heart attack in men (Assari, 2017).

The opposite pattern has been found for positive emotions. Positive emotions and well-being are associated with both short-term and long-term positive health outcomes (Diener & Chan, 2011; Howell et al., 2007; Sin, 2016) and reduced mortality (Chida & Steptoe, 2008). Hope and curiosity have been found to predict a decreased likelihood of hypertension, diabetes, and respiratory tract infections (Richman et al., 2005).

Personality traits also affect health: Optimism and conscientiousness are consistently associated with better health and longer life (Kern & Friedman, 2008; Smith, 2006). A positive emotional outlook can even affect the propensity to get sick from a common cold. For example, when adult volunteers were exposed to a virus that can cause colds, those with a positive emotional outlook were less likely to get sick (Cohen et al., 2003).

There are also indirect effects of positive emotions on health (DeSteno et al., 2013). A positive emotional outlook motivates people to engage in more healthful practices, such as regular sleep and exercise, and to pay more attention to health-related information. Positive emotions may also affect health indirectly by softening the impact of stressful life events and helping people feel more connected to others (Armenta et al., 2016; Cohen & Pressman, 2006; Richman et al., 2005).



People who smile widely and more in photos tend to live longer than those who do not (Abel & Kruger, 2010).



A positive outlook may guard against disease and buffer the impact of stress.

Rolf Bruderer/Blend Images LLC

### checkpoint can you ...

- Explain how emotions and personality may affect health?
- Identify risk factors for psychological distress and depressive symptoms?

## COGNITIVE DEVELOPMENT

What happens to cognitive abilities in middle age? How does age affect the ability to solve problems, to learn, to create, and to perform on the job?

### Cognitive Development at Midlife

The status of cognitive abilities in middle age has been a subject of much debate. Here, we look at two important lines of research: Schaie's Seattle Longitudinal Study and Horn and Cattell's studies of fluid and crystallized intelligence.

#### COGNITIVE PERFORMANCE

In many respects, middle-aged people are in their cognitive prime. The Seattle Longitudinal Study of Adult Intelligence (Schaie, 1994) demonstrates this fact.

The study began in 1956 with 500 randomly chosen men and women across a variety of different age brackets ranging from 22 to 67 years and involved multiple waves of data collection over 5 decades. The participants were followed longitudinally and assessed every 7 years on timed tests of six primary mental abilities (Table 2).

There were few uniform patterns of age-related change across cognitive abilities. Most participants showed no significant reductions in most abilities until after age 60 and then



Good spellers seem to remain good at spelling as they age. Poor spellers, however, get worse (Margolin & Abrams, 2007).

**TABLE 2** Tests of Primary Mental Abilities Given in the Seattle Longitudinal Study of Adult Intelligence

Test	Ability Measured	Task	Type of Intelligence*
<b>Verbal meaning</b>	Recognition and understanding of words	Find a synonym by matching the stimulus word with another word from a multiple-choice list	Crystallized
<b>Word fluency</b>	Retrieving words from long-term memory	Think of as many words as possible beginning with a given letter	Part crystallized, part fluid
<b>Number</b>	Performing computations	Do simple addition problems	Crystallized
<b>Spatial orientation</b>	Manipulating objects mentally in two-dimensional space	Select rotated examples of a figure to match the stimulus figure	Fluid
<b>Inductive reasoning</b>	Identifying patterns and inferring principles and rules for solving logical problems	Complete a letter series	Fluid
<b>Perceptual speed</b>	Making quick, accurate discriminations between visual stimuli	Identify matching and nonmatching images flashed on a screen	Fluid

\*Fluid and crystallized intelligence are defined in the Fluid and Crystallized Intelligence section.

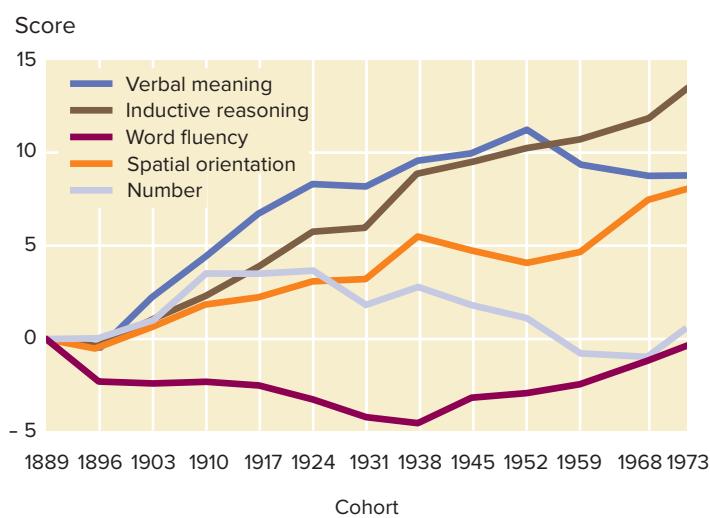
Sources: Schaie (1989); Willis & Schaie (1999).

not in most areas. Virtually no one declined on all fronts, and most people improved in some areas. For example, several abilities peaked during middle age, and verbal meaning even showed improvements into old age. However, about 13 to 17 percent of adults declined in number, memory recall, or verbal fluency between ages 39 and 53. By age 74, there were declines in the average scores for all abilities (Schaie, 1994, 2005; Willis & Schaie, 2006; Schaie & Willis, 2010).

Schaie and his colleagues also found that successive cohorts scored progressively higher at the same ages on most abilities, possibly because of improvements in education,

healthy lifestyles, and other positive environmental influences (Willis & Schaie, 2006; Figure 2). However, once declines began, these later cohorts also showed a more rapid mortality-related decline. In other words, later cohorts performed at a higher level for longer, and the amount of time they spent at a lower level of cognitive functioning was compressed at the end of their lives (Gerstorf et al., 2011).

Individuals who scored highest tended to be free of cardiovascular and other chronic diseases, physically active, from a higher socioeconomic class, have high educational levels and flexible personalities at midlife, to be in an intact family, to pursue cognitively complex occupations and other activities, to be married to someone more cognitively advanced, to be satisfied with their accomplishments, and to be high in the personality dimension of openness to experience (Schaie, 2005; Willis & Schaie, 2006; Sharp et al., 2010; Schaie & Willis, 2010; Lindwall et al., 2012). Given the strong cognitive performance of most in middle age, evidence of substantial cognitive decline in persons younger than 60 may indicate a neurological problem (Schaie, 2005). In particular, midlife decline in memory recall and verbal fluency (Willis & Schaie, 2006) and perceptual processing speed (Schaie & Willis, 2010) predict cognitive impairment in old age.



**FIGURE 2**

### Cohort Differences in Scores on Tests of Primary Mental Abilities

Later cohorts scored higher on inductive reasoning, word fluency, and spatial orientation.

Source: From Schaie (2005).

## FLUID AND CRYSTALLIZED INTELLIGENCE

Imagine a glass of water. If you tilt it, the water sloshes around in random swirls and waves. By contrast, a block of ice has a rigid crystalline structure, with every molecule in its place. This is the metaphor used by another set of cognitive researchers to describe the different types of intelligence (Horn & Catell, 1967).

**Fluid intelligence** is the ability to solve novel problems on the fly. Such problems require little or no previous knowledge, such as realizing that a hanger can be used to fix a leaky toilet or discovering the pattern in a sequence of figures. It involves perceiving relations, forming concepts, and drawing inferences. **Crystallized intelligence**, by contrast, is the ability to remember and use information acquired over a lifetime, such as finding a synonym for a word or solving a math problem. It is fixed, as is the structure of ice. Crystallized intelligence is measured by tests of vocabulary, general information, and responses to social situations and dilemmas—abilities that depend largely on education and cultural experience.

Typically, fluid intelligence peaks in young adulthood. This is particularly true for perceptual speed, which peaks quite early, beginning in the twenties. From ages 20 to 60, the average person will lose more than one standard deviation in fluid intelligence (Salthouse, 2010). Working memory capacity also declines with age. However, many older adults perform in the real world at high levels despite the apparent declines in fluid intelligence (Salthouse, 2012). How do we make sense of this discrepancy between cognitive declines and real-world performance?

One explanation is offered by improvements in crystallized intelligence, which increase through middle age and often until near the end of life (Horn & Catell, 1967; Cattell, 1963). Older adults can use their accumulated lifetime of knowledge to compensate for tasks in which decision making can benefit from prior experiences (Li et al., 2013). Thus, you might expect that older adults would do as well or better on tasks such as filling out a tax return, where crystallized intelligence would be helpful, but not on tasks such as learning how to use a new smartphone, where fluid intelligence would be more important (Zaval et al., 2015).

People's cognitive performance offers insight into their overall health. While crystallized intelligence is not associated with mortality risk once sociodemographic factors are considered, fluid intelligence is strongly predictive of mortality risk (Batterham et al., 2009; Aichele et al., 2015). Additionally, a large discrepancy between fluid and crystallized intelligence, particularly for highly educated people, may be an indicator of cognitive decline (O'Shea et al., 2018).

### fluid intelligence

Type of intelligence, proposed by Horn and Cattell, that is applied to novel problems and is relatively independent of educational and cultural influences.

### crystallized intelligence

Type of intelligence, proposed by Horn and Cattell, involving the ability to remember and use learned information; it is largely dependent on education and culture.

## checkpoint can you...

- Summarize results of the Seattle Longitudinal Study of Adult Intelligence?
- Distinguish between fluid and crystallized intelligence, and tell how they are affected by age.

# The Distinctiveness of Adult Cognition

Although there are declines associated with aging, that is not the full story. Here we investigate some of the distinctive qualities in the thinking of mature adults.

## EXPERTISE

Two young resident physicians in a hospital radiology laboratory examine a chest X-ray. They study an unusual white blotch on the left side. “Looks like a large tumor,” one of them says finally. The other nods. Just then, a longtime staff radiologist walks by and looks over their shoulders at the X-ray. “That patient has a collapsed lung and needs immediate surgery,” he declares (Lesgold et al., 1988).

Why do mature adults show increasing competence in solving problems in their chosen fields? One answer seems to lie in specialized knowledge, or expertise—a form of crystallized intelligence that is related to the process of encapsulation.



*Expertise in interpreting X-rays, as in many other fields, depends on accumulated, specialized knowledge, which continues to increase with age. Experts often appear to be guided by intuition and cannot explain how they arrive at conclusions.*

Terry Vine/Blend Images LLC

#### **encapsulation**

In Hoyer's terminology, the process that allows expertise to compensate for declines in information-processing ability by bundling relevant knowledge together.

If you needed surgery, would you rather go to a middle-aged doctor or one who is considerably older or younger? Why?



Because formal education is age-graded, most children learn similar things—such as how to read or complete math problems—at roughly the same time. In adulthood, however, paths of learning diverge, and adults become more or less learned in whatever domain of knowledge they pursue. These advances in expertise continue at least through middle adulthood and, for the most part, are not related to general intelligence. Moreover, they usually do not depend on the brain's information-processing machinery because some adults' fluid intelligence abilities become encapsulated; that is, dedicated to handling specific kinds of knowledge. This process of **encapsulation** makes that knowledge easier to access, to add to, and to use. It may take middle-aged people longer than younger people to process new information. But when it comes to solving problems within their field of expertise, their encapsulated knowledge compensates and allows them to rapidly and effectively solve a problem (Hoyer & Rybush, 1994).

Experts assimilate and interpret new knowledge more efficiently by referring to a rich, highly organized storehouse of mental representations of what they already know. For example,

imaging studies show that when completing a task within their domain of expertise, experts show brain activation in areas associated with long-term memory. This allows them to integrate information in long-term memory with working memory in “chunks” and thus perform the task at a higher level than novices (Guida et al., 2012). Moreover, experts also show processing differences depending on the difficulty of the task. In one study, highly experienced clinical neurologists showed enhanced functional connectivity in their brains when diagnosing ambiguous cases compared to when they diagnosed straightforward cases. Presumably, the stronger connectivity reflected the increased cognitive demands involved in resolving uncertainty (van den Berg et al., 2020). Experts also sort information on the basis of underlying principles, rather than surface similarities and differences. And, importantly, they are more aware of what they do not know (Charness & Schultetus, 1999; Goldman et al., 1999).

Expert thinking often seems automatic and intuitive. Experts generally are not fully aware of the thought processes that lie behind their decisions (Charness & Schultetus, 1999; Salas et al., 2010). They cannot readily explain how they arrive at a conclusion or where a nonexpert has gone wrong. Such intuitive, experience-based thinking is also characteristic of what has been called postformal thought.

## **INTEGRATIVE THOUGHT**

Although not limited to any particular period of adulthood, postformal thought seems well suited to the complex tasks, multiple roles, and perplexing choices and challenges of midlife, such as the need to synthesize and balance work and family demands (Sinnott, 2003). An important feature of postformal thought is its integrative nature (Kallio, 2011). Mature adults interpret what they read, see, or hear in terms of its meaning for them. Instead of accepting something at face value, they filter it through their life experience and previous learning.

In one study (Adams, 1991), early and late adolescents and middle-aged and older adults were asked to summarize a Sufi teaching tale. In the story, a stream was unable to cross a desert until a voice told it to let the wind carry it; the stream was dubious but finally agreed and was blown across. Adolescents recalled more details of the story than adults did, but their summaries were largely limited to repeating the story line. Adults, especially women, gave summaries that were rich in interpretation, integrating what was in the text with its psychological and metaphorical meaning for them, as in this response of a 39-year-old:

I believe what this story was trying to say was that there are times when everyone needs help and must sometimes make changes to reach their goals. Some people may resist change for a long time until they realize that certain things are beyond their control and they need assistance. When this is finally achieved and they can accept help and trust from someone, they can master things even as large as a desert. (p. 333)

Society benefits from this integrative feature of adult thought. Generally, it is mature adults who translate their knowledge about the human condition into inspirational stories to which younger generations can turn for guidance.

## Creativity

Intelligence and creativity are not the same thing. Although a certain baseline general intelligence, or IQ, is needed (Guilford, 1956), creative performance is not strongly related to general intelligence once that threshold is reached (Simonton, 2000). This is true even though the baseline IQ needed for creative performance does rise for more complex creative achievements (Jauk et al., 2013).

Intelligence seems to be more strongly influenced by genetic processes than creativity does. Intelligence shows high heritability, and its heritability rises with age as individuals get older and seek out more experiences in line with their proclivities (Plomin & Deary, 2015). A similar process may be operating in creativity. Earlier studies suggested genetic contributions were weak (Runco et al., 2011; Reuter et al., 2006). More recent studies suggest that genetic influences are stronger than initially believed and that, as with intelligence, their importance may rise with age (Vinkhuyzen et al., 2009; Piffer & Hur, 2014; Hur et al., 2014).

Highly creative people are self-starters and risk-takers. They tend to be independent, nonconformist, unconventional, high in emotional intelligence, high in positive affect, and open to new ideas and experiences. Their thinking processes are often unconscious, leading to sudden moments of illumination (Simonton, 2000; Da Costa et al., 2015). They think in flexible ways and explore many possible solutions to problems (Baas et al., 2015).

However, this is not enough. Extraordinary creative achievement requires deep, highly organized knowledge of a subject and a strong emotional attachment to the work, which spurs the creator to persevere in the face of obstacles. A person must first be thoroughly grounded in a field before they can see its limitations, envision radical departures, and develop a new and unique point of view (Keegan, 1996; Baer, 2015).

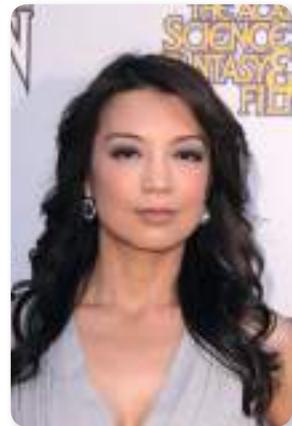
Not surprisingly, researchers have looked for creative problem-solving correlates in the brain. This research is challenging—creative ideas, by their very nature, are divergent and wide-ranging. One meta-analysis including 34 imaging studies showed that when people were engaged in creative tasks, they showed more activation in the prefrontal cortex regardless of what type of creative task they were performing. However, different areas became more active depending on task demands. For example, tasks that required inhibitory processes, fluency, and control were likely to generate activity in the lateral prefrontal cortex, whereas tasks that required the activation of semantic (meaning-based) associations tended to elicit more activity in the superior and inferior central gyri (Gonen-Yaacovi et al., 2013).

### CREATIVITY AND AGE

Is there a relationship between creative performance and age? On psychometric tests of divergent thinking, age differences consistently appear. Whether data are cross-sectional or longitudinal, scores peak, on average, around the late thirties (Simonton, 1990). After this, they remain relatively flat for some time and then decline in the seventies (Massimiliano, 2015). A similar age curve emerges when creativity is measured by variations in output (number of publications, paintings, or compositions).

### checkpoint can you . . .

- Discuss the relationship between expertise, knowledge, and intelligence?
- Give an example of integrative thinking?



Ming-Na Wen, an American actress and model, has continued to work steadily throughout her 50s and in 2022 received a star on the Hollywood Walk of Fame.  
s\_bukley/Shutterstock



Usually, the ability to focus closely on something is a benefit. However, research suggests the "chaotic minds" of people with ADHD might be beneficial during some creative tasks. In one study, adults with ADHD asked to imagine and draw alien fruit and to invent a product label were more creative in their efforts than adults without ADHD (White, 2018).

A person in the last decade of a creative career typically produces only about half as much as during the late thirties or early forties, though somewhat more than in the twenties (Simonton, 1990).

Poets, mathematicians, and theoretical physicists tend to be most prolific in their late twenties or early thirties. Research psychologists reach a peak around age 40, followed by a moderate decline. Novelists, historians, and philosophers become increasingly productive through their late forties or fifties and then level off. These patterns hold true across cultures and historical periods (Dixon & Hultsch, 1999; Simonton, 1990).

However, there are some indications that this data, or the interpretations of it, may be flawed. For instance, it is not clear that productivity should be the metric by which creativity is measured, especially as some research suggests that older adults' work remains innovative over time. For example, meta-analyses of age and creativity at work suggest there is no direct relationship between the two and that much depends on how creativity is defined (Rietzschel et al., 2016; Ng & Feldman, 2013). Additionally, patterns of creative output may have changed for more recent cohorts. For example, whereas previous research seemed to suggest researchers' productivity peaked in the forties, more recent data suggest that those researchers who are productive when young continue to publish scholarly articles at high rates until retirement (Stroebe, 2015).

## checkpoint can you...

- ▶ Discuss prerequisites for creative achievement?
- ▶ Summarize the relationship between creative performance and age?

# Work and Education

In all cultures, adults need to work to support themselves and their families. In developing countries, adults often take on the same roles as their parents, and there is less occupational choice. In industrialized societies, there are a multitude of life paths, and the work people do reflects this. Moreover, retirement is more likely to be an option in industrialized societies.

We become more ambidextrous—using either hand rather than a dominant hand to perform functions—as we get older. Researchers suggest this may be tied to retirement. Generally, we intensify this dominance in everyday activities. Once retirement occurs and those activities change, so may our dominance (Kalisch et al., 2006).



## WORK AND RETIREMENT

Before 1985, the average age of retirement moved steadily downward. Since then, the trend has reversed, and age at retirement has moved steadily upward. However, before bringing their working lives to a complete stop, people may reduce work hours or days, gradually moving into retirement over a number of years. This practice is called phased retirement. Or they may switch to another company or a new line of work, a practice called bridge employment (Czaja, 2006). A majority of older Americans now remain active in the labor force after retirement from their career job (Cahill et al., 2013). Not surprisingly, those people who have retired or entered partial retirement are generally more interested in volunteering (Tang, 2016).

People sometimes continue working to maintain their physical and emotional health and their personal and social roles or simply because they enjoy the stimulation of work (Czaja, 2006; Sterns & Huyck, 2001). Others work primarily for financial reasons. For example, data show that the implementation of the Affordable Care Act, which increased the affordability of comprehensive health care for many, led to increased early retirement and increases in part-time work (which does not generally include health benefits) among women and low-income men (Heim & Lim, 2017).

As with many areas of life, the COVID-19 pandemic affected patterns of retirement. The US economy, as a whole, faced massive job losses in early 2020, and older adults were not immune from these losses (Baily et al., 2020). Employment declines were highest for low-earner, women, BIPOC, and non-college-educated workers (Davis, 2021). Overall, 15 percent of older workers—some 5.7 million adults aged 55 and over—lost their jobs in spring 2020 (Gould, 2021). Moreover, many older adults, when faced with their elevated mortality risk from COVID-19, increased occupational stress, and the disruptions of the pandemic, opted to phase into retirement. This trend was particularly apparent in both the lowest- and highest-earning groups (Davis, 2021). As of Decem-

ber 2021, the labor force was roughly 3.8 million workers short of prepandemic levels, with nearly half of the “missing” workers accounted for by those 55 years and older (Davis & Radpour, 2021).

## WORK AND COGNITIVE DEVELOPMENT

“Use it or lose it” applies to the mind as well as the body. Work can influence cognitive functioning.

Occupational choice can affect this process in adults in an interactive fashion. For example, people with high cognitive ability tend to seek out, obtain, and be good at substantively complex work—work that requires thought and independent judgment. In turn, complex work is associated with the retention of cognitive abilities. Those cognitive abilities then allow older adults to keep working as effectively as a younger person, even in the face of general age-related declines in cognitive processes (Fisher et al., 2017).

Work need not necessarily be construed in the traditional way, and the same is true of men and women engaged in complex household work, such as planning a budget or making complicated repairs such as putting in new plumbing (Caplan & Schooler, 2006). Regardless of the specifics, people who are deeply engaged in complex work or cognitively stimulating lifestyles tend to show stronger cognitive performance and fewer declines than their peers as they age (La Rue, 2010).

Openness to experience (OTE)—a personality variable—also affects cognitive performance over time (Sharp et al., 2010). People who are high on OTE are more likely to retain their faculties, including fluid ability, episodic memory, and verbal abilities (Curtis et al., 2015). Similarly, those people who consistently seek more stimulating opportunities are likely to remain mentally sharp (Avolio & Sosik, 1999). Interestingly, this association may work both ways. Older adults enrolled in a cognitive training program for 30 weeks showed increases in openness to experience at the conclusion of the training (Jackson et al., 2012).

This suggests that if work, both on the job and at home, could be made meaningful and challenging, more adults might retain or improve their cognitive abilities. This seems to be happening to some extent. The gains in cognitive abilities seen in older cohorts may reflect workplace changes that put a premium on adaptability, initiative, and decentralized decision making. On the other hand, work can also be a significant stressor, particularly when financial concerns dominate (see Research in Action).

## ADULT EDUCATION

Expanding technology and shifting job markets often create a need for more training or education. In 2016, 23.6 percent of US adults age 45 to 54 and 20.2 percent of adults age 55 to 65 completed a work experience or credential program (National Center for Education Statistics, 2018).

Technological skills are increasingly necessary for success in the modern world and are a major component of work-related adult education. With experience, middle-aged people can perform computer-based tasks as well as young adults (Czaja, 2006), especially when they are high in positive affect and sense of control, and have retained psychomotor speed (Zhang et al., 2017).

**Literacy Training** Literacy is a fundamental requisite for participation not only in the workplace but in all facets of a modern, information-driven society. At the turn of the twentieth century, a person with a fourth-grade education was considered literate; today, a high school diploma is barely adequate.

Globally, 773 million adults, mostly in sub-Saharan Africa and Southern Asia, are illiterate. Women make up two-thirds of illiterate adults worldwide. Illiteracy is especially common among women in developing nations, where education typically is considered unimportant for them. The United Nations Educational, Scientific, and Cultural Organization is currently involved in Capacity Development for Education, an effort

### checkpoint can you...

- Discuss trends in work and retirement in middle age?
- Explain how work can affect cognitive functioning?



From what you have seen, do students of nontraditional age seem to do better or worse in college than younger students? How would you explain your observation?

### **literacy**

(1) Ability to read and write. (2) In an adult, ability to use printed and written information to function in society, achieve goals, and develop knowledge and potential.

# research in action

## HARD TIMES: FINANCIAL STRESS AT MIDLIFE

“Your car’s transmission is the problem, and it’s going to cost about \$2,000 to get it fixed.” The mechanic’s words kept echoing through 48-year-old Rachel’s mind as she tried to focus on work and remember what her customer had just asked for. How were they going to come up with the money? What would they do?

Financial and work-related issues are particularly relevant at midlife, when the competing concerns of young children in the home or elderly parents needing assistance tend to rise for many adults. Research finds that, like Rachel, nearly half of US households report that they certainly or probably could not come up with the money to pay for a financial shock of this size (Lusardi et al., 2011). Yet, these expenses often occur, causing stress and driving individuals to make poor financial decisions such as taking payday loans.

As individuals perceive that their basic needs (e.g., food or money) are threatened, this expends cognitive bandwidth, increases attentional tunneling, diminishes self-control, and decreases optimal decision making (Mani et al., 2013; Mullainathan & Shafir, 2014). As Rachel focuses her attention on her financial stress instead of her work, she is likely to make mistakes, and in some cases (especially in hazardous occupations), the consequences could be severe (Petitta et al., 2020; Wickens, 1996).

From workers feeling that they are about to lose their job to feeling overqualified, the adverse effects of economic stress on workers and their families has been documented by a large body of scholarship. A few of these effects include poorer long-term career outcomes, relational impairments, and decreased mental and physical health (Jiang & Lavayse, 2018; McKee-Ryan & Harvey, 2011; Richardson et al., 2013).

The economic crisis caused by the COVID-19 pandemic, along with the measures required to slow viral transmission, have also heightened economic stress (Sinclair et al., 2020; 2021), which has been most damaging to those already at risk. Specifically, the economically strained have less bandwidth to respond to public health officials’ demands. They also have fewer resources that allow them to stock up on emergency supplies (groceries, personal protection equipment, etc.) or care for children without day care or who are learning remotely.

Financial stress that begins in childhood can have notable impacts as well. Employment rates, educational attainment, and earnings vary considerably across parental income distributions (Chetty et al., 2016; Chetty et al., 2018). This can lead children into a cycle of economic stress that often spans generations. This cycle helps explain why even amid economic growth, a substantial percentage of the workforce is considered the “working poor”—individuals who are employed but remain in poverty (Bond & Galinsky, 2011; Leana et al., 2012). As these individuals experience daily economic stress, adverse individual, organizational, and societal consequences ensue.



In what ways, if any, have you seen economic stress affect people?  
Who's responsible for working to minimize economic stress and its impact?  
The government and policy makers?  
Leaders in the work organization? Or the individual through strategies such as better money management?

### checkpoint can you ...

- Give reasons why mature adults return to the classroom?
- Discuss the importance of literacy and literacy training in the United States and internationally?

providing targeted evidence-based assistance with educational reform to vulnerable countries (UNESCO, 2017).

In 2014, 17 percent of US adults could not locate clearly identifiable information in brief English prose, 27 percent could not perform simple numerical operations such as addition, and 23 percent could not use simple technological tools such as email or the internet. Middle-age and older adults tend to have lower literacy levels than young adults, but the average literacy level of adults age 50 to 59 has increased since 1992. Adults below basic literacy are less likely to be employed than adults at higher literacy levels. In the United States, the National Literacy Act requires states to establish literacy training centers with federal funding assistance. Compared to other countries, the United States ranks about average on literacy tests. However, US adults are clustered at both the high and low ends of the scale (Rampey et al., 2016).

# summary and key terms

## Middle Age: A Social Construct

- The concept of middle age is a social construct. It came into use in industrial societies as an increasing life span led to new roles at midlife.
- The span of middle adulthood is often subjective.
- Middle adulthood is a time of both gains and losses.
- Most middle-aged people are in good physical, cognitive, and emotional condition. They have heavy responsibilities and multiple roles and feel competent to handle them.
- Middle age is a time for taking stock and making decisions about the remaining years.

## PHYSICAL DEVELOPMENT

### Physical Changes

- Although some physiological changes result from aging and genetic makeup, behavior and lifestyle can affect their timing and extent.
- Most middle-aged adults compensate well for gradual, minor declines in sensory and psychomotor abilities. Losses in bone density and vital capacity are common.
- Symptoms of menopause and attitudes toward it may depend on cultural factors and natural changes of aging.
- Although men can continue to father children until late in life, many middle-aged men experience a decline in fertility and frequency of orgasm.
- A large proportion of middle-aged men experience erectile dysfunction. Erectile dysfunction can have physical causes but also may be related to health, lifestyle, and emotional well-being.
- Sexual activity generally diminishes gradually in middle age.  
**presbyopia** (436)  
**myopia** (436)  
**presbycusis** (436)  
**basal metabolism** (437)  
**vital capacity** (439)  
**infertility** (439)  
**menopause** (440)  
**perimenopause** (440)  
**erectile dysfunction** (442)

### Physical and Mental Health

- Most middle-aged people are healthy and have no functional limitations.
- Hypertension is a major health problem beginning in midlife. Cancer has passed heart disease as the number one cause of death in midlife. The prevalence of diabetes has doubled.
- Diet, exercise, alcohol use, and smoking affect present and future health. Preventive care is important.
- Low income is associated with poorer health.
- Racial and ethnic disparities in health and health care have decreased but still persist.
- Postmenopausal women become more susceptible to heart disease as well as to bone loss leading to osteoporosis. Chances of developing breast cancer also increase with age.
- Hormone therapy is highly effective for treating some of the symptoms of menopause but has a complex pattern of risks and benefits.
- Stress occurs when the body's ability to cope is not equal to the demands on it. Stress is related to a variety of practical problems. Severe stress can affect immune functioning.
- Role and career changes and other experiences typical of middle age can be stressful, but resilience is common.
- Personality and negative emotionality can affect health. Positive emotions tend to be associated with good health.
- Psychological distress is prevalent in middle age.

**hypertension** (443)

**diabetes** (443)

**osteoporosis** (447)

**mammography** (448)

**hormone therapy (HT)** (448)

**stress** (449)

**stressors** (449)

## COGNITIVE DEVELOPMENT

### Measuring Cognitive Abilities in Middle Age

- The Seattle Longitudinal Study of Adult Intelligence found that several of the primary mental abilities remain strong during middle age, but there is great individual variability.
- Fluid intelligence declines earlier than crystallized intelligence.

**fluid intelligence** (453)

**crystallized intelligence** (453)

### The Distinctiveness of Adult Cognition

- Some theorists propose that cognition takes distinctive forms at midlife. Advances in expertise, or specialized knowledge, have been attributed to encapsulation of fluid abilities within a person's chosen field.
- Postformal thought seems especially useful in situations calling for integrative thinking.

**encapsulation** (454)

## Creativity

- Creative performance depends on personal attributes and environmental forces.
- Creativity is not strongly related to intelligence.
- Previous research suggested there was an age-related decline in creative output by occupation, but more recent data suggest findings may be more complex than originally thought.

## Work and Education

- A shift away from early retirement and toward more flexible options is occurring.
- Complex work may improve cognitive flexibility.
- Many adults participate in educational activities, often to improve work-related skills and knowledge.
- Literacy training is an urgent need in the United States and globally.

**literacy (457)**

## outline

- Theoretical Models of Change at Midlife
- Issues and Themes at Midlife
- Relationships at Midlife
- Consensual Relationships
- Relationships with Maturing Children
- Other Kinship Ties

## learning objectives

- Discuss stability and change in development in middle adulthood.
- Summarize personality development and psychological adjustment in middle age.
- Identify some important aspects of close relationships in middle adulthood.

# Psychosocial Development in Middle Adulthood



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## did you know?

- The idea of a midlife crisis has been largely discredited, and it is fairly unusual to have one.
- Marital satisfaction generally bottoms in early middle age and, for those with children, peaks when they are grown.
- With adequate support, caring for an infirm parent can be an opportunity for personal growth.

*In this chapter, we look at theoretical perspectives and research on psychosocial issues and themes at midlife. We do this keeping in mind the amazing diversity of experiences. However, given the biases and prejudices against variations in gender identity and sexuality, as well as the relatively recent legalization of gay marriage in the United States, the research cited in this chapter focuses primarily on cisgender, heterosexual relationships. When possible, more diverse research is included.*



**L**ive as if you were to die tomorrow. Learn as if you were to live forever.

—Mahatma Gandhi (1869–1948)

# Theoretical Models of Change at Midlife

In psychosocial terms, middle adulthood once was considered a relatively stable period of development in which little change occurred. Middle-aged adults were rarely the object of direct study. However, there is a renewed interest in midlife research (Infurna et al., 2020). The changing demographics of countries such as the United States, where large proportions of middle-aged adults are moving into late adulthood, has made studying the dynamics of this age more vital. In this section, we focus on some classic models of middle adulthood that have had the greatest impact on the field as a way to frame our understanding of development in midlife.

## NORMATIVE-STAGE MODELS

Erikson (1985) believed that the years around age 40 were a time when people entered their seventh psychosocial stage: **generativity versus stagnation**. **Generativity**, as Erikson defined it, involved finding meaning through contributing to society and leaving a legacy for future generations.

Typically, generativity is expressed by being a parent or grandparent, although this is not the only path (Chen et al., 2019). It can be expressed through teaching or mentorship, productivity or creativity, and self-generation or self-development. It can extend to the world of work, to politics, to religion, to hobbies, to art, to music, and to other spheres, or as Erikson called it, “maintenance of the world.” People who do not find an outlet for generativity run the risk of becoming self-absorbed, self-indulgent, and stagnant. Adults who slide into stagnation may find themselves disconnected from their communities because of their failure to find a way to contribute.

Erikson believed that generativity was especially salient during midlife because of the demands placed on adults through work and family. Research (see Box 1) supports the claim that middle-aged people do indeed score higher on generativity than younger and older ones (Keyes & Ryff, 1998). The age at which individuals achieve generativity varies, as does its strength at any particular time, and some people are more generative than others (McAdams, 2006; Stewart & Vandewater, 1998). Gender exerts an influence. For women, being a parent does not seem to be pivotal in the development of generativity. However, for men, having a child early in adulthood is associated with greater generativity. In one study, young fathers had higher scores on generative behavior than older fathers (Karacan, 2014). By late adulthood, levels of generativity in men and women are more similar (Keyes & Ryff, 1998; Cox et al., 2010).

Overall, highly generative people tend to report greater well-being and satisfaction in midlife and in later adulthood (Sheldon & Kasser, 2001; Adams-Price et al., 2018), perhaps through the sense of having contributed meaningfully to society (Roman, 2018). Generativity is associated with prosocial behaviors, such as volunteering for community service or for a political cause (McAdams, 2006; Hart et al., 2003; Matsuba et al., 2012). Generativity can also be a motive at work and is generally tied to positive career outcomes (Doerwald et al., 2020).

### generativity versus stagnation

Erikson's seventh stage of psychosocial development, in which the middle-aged adult develops a concern with establishing, guiding, and influencing the next generation or else experiences stagnation (a sense of inactivity or lifelessness).

### generativity

Erikson's term for concern of mature adults for finding meaning through contributing to society and leaving a legacy for future generations.

### BOX 1 A Self-Report Test for Generativity

- I try to pass along the knowledge I have gained through my experiences.
- I do not feel that other people need me.
- I think I would like the work of a teacher.
- I feel as though I have made a difference to many people.
- I do not volunteer to work for a charity.
- I have made and created things that have had an impact on other people.
- I try to be creative in most things that I do.
- I think that I will be remembered for a long time after I die.
- I believe that society cannot be responsible for providing food and shelter for all homeless people.
- Others would say that I have made unique contributions to society.
- If I were unable to have children of my own, I would like to adopt children.
- I have important skills that I try to teach others.
- I feel that I have done nothing that will survive after I die.
- In general, my actions do not have a positive effect on others.
- I feel as though I have done nothing of worth to contribute to others.
- I have made many commitments to many different kinds of people, groups, and activities in my life.
- Other people say that I am a very productive person.
- I have a responsibility to improve the neighborhood in which I live.
- People come to me for advice.
- I feel as though my contributions will exist after I die.

Source: McAdams & de St. Aubin (1992).

*As a whole, religious and spiritual adults tend to be more generative.*

PKG Photography/Moment/Getty Images



The positive effects are also physical in nature; generativity is also associated with good health and a decreased risk of disability, cognitive decline, and mortality (Gruenewald et al., 2012; Malone et al., 2016). Highly generative people stay continually engaged in life, and this builds competencies, strengthens social bonds, improves self-image, and provides meaning (Kruse & Schmitt, 2012).

**Cultural Influences on Generativity** Although Erikson stressed the role of culture, relatively little research has focused on generativity across different cultural settings. However, because individualism is more likely to involve a concern with the self and collectivism is more likely to involve concern for others, cultural differences would be predicted to play a role.

Research conducted in Cameroon, Costa Rica, and Germany showed that although a generativity model could be successfully applied to all cultures, the variables of import differed across cultures. Cameroonian participants scored higher on generativity and generative concern, a finding in line with the collectivistic values of their culture. Germans, whose culture is more individualistic than the other groups, scored lowest on their motivation to volunteer in the community (Hofer et al., 2008). Culture can also affect the consequences of generativity. A comparison of the Czech Republic, Germany, and Hong Kong showed differences in the link between generative concern and positive emotions. Although in all cultures this link was mediated by individual achievement goals, only in the more collectivistic Hong Kong did altruism also serve as a mediator (Au et al., 2019). Generativity may also not be age-graded to the same degree in other cultures.

In Argentina, for example, young, middle-age, and older adults engage in similar levels of generative activity (de Espanés et al., 2015).

Within a large country such as the United States, there are multitudes of different ethnic and cultural groups, and cultural differences in generativity also exist across different groups. For example, as a whole, religious and spiritual adults tend to be more generative than are those who are less religious (Emmons & Paloutzian, 2003; Dillon et al., 2003). This process interacts with race and ethnicity. In one study, generativity was associated with church attendance and involvement in church activities, but African Americans scored higher on generativity and religious variables than did White participants (Hart et al., 2001). Political ideology matters as well, although its effects may be nuanced. For example, because issues such as climate change and pollution may affect later generations, generativity and environmentalism would be predicted to be positively correlated. People who are politically conservative are generally more generative but less supportive of environmentalism. However, highly generative conservatives are more pro-environment (Barnett et al., 2019).

The research conducted in this area suggests that although generativity in midlife is common across cultures, the form it takes, the consequences it has, and the prevalence of it across different age groups may differ. However, generativity leads to positive outcomes and behaviors regardless of where the individual is from.

## TRAIT MODELS

Recall that the best-known trait model of personality described the individual differences between people as consisting of five factors: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Costa & McCrae, 1980). The research in this area originally claimed that these traits, known as the Big Five, were relatively continuous and were not believed to change in any appreciable way after the age of 30.

Studies show there are normative developmental trends in personality. Specifically, in adulthood, people generally show increases in agreeableness, conscientiousness, and emotional stability and decreases in extraversion, neuroticism, and openness to experience (Roberts et al., 2006; Milojev & Sibley, 2017). This is important because subjective well-being (how happy a person feels) is related to personality traits, especially neuroticism. People who are high in neuroticism are more likely to experience a low sense of subjective well-being. High extraversion and conscientiousness, by contrast, are associated with high subjective well-being (Weiss et al., 2008; Anglim & Grant, 2016; Grant et al., 2009).

People also show individual change in response to unique life trajectories. For example, compared to people who continue to work, retirees tend to increase in agreeableness—becoming more straightforward, altruistic, and modest—and decrease in activity (Lockenhoff et al., 2009). However, those who, against their will, become unemployed show decreases in agreeableness and conscientiousness. This relationship is stronger, especially in men, the longer the unemployment persists (Boyce et al., 2015). Social relationships matter too. Middle-age men who remarry tend to become less neurotic (Roberts & Mroczek, 2008). Men who divorce decrease in extraversion. Any increases in extraversion and agreeableness, along with decreases in neuroticism, tend to be associated with high perceived social support (Allemand et al., 2015). People can also change in response to wider social issues. For instance, during the COVID-19 pandemic, health care workers, who were under enormous stress, showed increases in neuroticism, conscientiousness, and extroversion, and decreases in agreeableness and openness to experience (Ahmet et al., 2020).

**Culture and Personality** It does appear that, at least in literate, urban samples across a large number of cultures, the Big Five traits are a good representation of personality (McCrae & Costa, 1997; McCrae & Terracciano, 2005). However, either the traits themselves or the processes that underlie them are likely not universal. For example, in one study, researchers found the same traits represented in Japanese and American samples over a 9-year period; however, there were much greater fluctuations in trait levels in the



The Big Five traits are related to actual, physical differences in brain structures of adults. For example, extraversion is correlated to the size of the medial orbitofrontal cortex—an area of the brain involved in processing rewards—and neuroticism is related to the volume of brain areas associated with threat and punishment. This supports a biologically based model of the Big Five (DeYoung et al., 2010).

Japanese than in the American sample (Chopik & Kitayama, 2018). This process interacts with gender. Research across 55 nations has shown that gender differences in personality traits are larger in more prosperous nations where women have more equality. In such nations, women tend to report higher levels of neuroticism, extraversion, agreeableness, and conscientiousness than men (Schmitt et al., 2008).

Moreover, the same five factors may not exist in all cultures. A study involving individuals of the Tsimané, a preliterate, hunter-gatherer indigenous society, did not find the same five-factor personality structure. The structure that emerged from their data could more accurately be characterized as two primary factors organized around “prosociality” and “industriousness,” perhaps more important in a society dependent on subsistence labor to survive (Gurven et al., 2013). Thus, culture may affect which features of the personality emerge as important or the processes that involve personality change over time.

## TIMING OF EVENTS MODELS

Every culture has a social clock describing the ages at which people are expected to reach certain milestones. Timing of events models suggest that, rather than being based on years lived, development is more affected by when events occur in a person’s life. In other words, what matters is not that a person turns 65 but that the person retires.

In previous generations, the timing of major events in the social clock were fairly predictable. When occupational patterns were more stable and retirement at age 65 was almost universal, the meaning of work was more similar for all adults nearing retirement age. However, in a time of frequent job changes, downsizing, and either early or delayed retirement, the meaning of work is more variable. Similarly, when most women’s lives revolved around bearing and rearing children, the end of the reproductive years meant something different. When people died at younger ages, those who survived into middle age were more likely to feel that they were reaching the end of their life. Today, middle-aged people may be raising children, being parents to adolescents and young adults, or serving as caregivers to aging parents. Because the pathways people take are more varied, so are the boundaries of middle age.

Research has shown a number of factors affect people’s subjective sense of aging and their entry into middle age. Ethnic minority group members, people who have lower levels of education or socioeconomic status, young parents, divorced people, or people whose parents have died tend to report an earlier age of entry into middle age (Toothman & Barrett, 2011; Barrett & Toothman, 2017). Gender also alters the subjective timeline. Women report that middle age starts and ends later than men report, perhaps in an attempt to avoid the social devaluation conferred upon “old” women (Toothman & Barrett, 2011). Getting older matters as well. As people age, they tend to report feeling younger than they actually are, and what they consider to be “middle-aged” versus “old” shifts upward (Shinan-Altman & Werner, 2019).

While many middle-aged adults seem well able to handle this life stage (Lachman, 2004), research suggests that adults who get “off track” may have more difficulties. For example, one study of almost 700 Turkish adults found that those who perceived themselves as having married “on time” showed higher levels of well-being, autonomy, competence, and relatedness than those who perceived themselves as having married early or late (Pekel-Uludağlı & Akbaş, 2016). Similarly, longitudinal research with 405 Canadian adults found early marriage was associated with a lower risk of depression in middle age. This provides support for the influence of social norms on age (Johnson et al., 2017).

There are many norms regarding the “correct” timing for life events, and one particularly strong influence, especially for women, involves norms surrounding parenting. Early parenting, for instance, has been associated with declines in well-being and an increased risk of depression when compared to on-time parenting (Koropeckyj-Cox et al., 2007; Pekel-Uludağlı & Akbaş, 2019). Late parenting also violates social norms. In survey data collected from 25 European countries involving more than 43,000 people, 57.2 percent of respondents said that women over the age of 40 were generally too old to consider having

a child (Billari et al., 2010), despite estimates that only about 17 percent of 40-year-old women are definitely infertile (Leridon, 2008). Still, because of the intense, time-graded social norms regarding motherhood, women are likely to feel increasing pressure to have children with age, and this affects adjustment to midlife. Whereas women who have children report declines in reproductive anxiety over time, women who do not have children are more likely to express anxiety about reproductive aging (Barrett & Toothman, 2017). This process can interact with culture. For instance, research in 12 European countries found that those women who had children more than 2 years later than their country's average age for their cohort were, in old age, lonelier than those who had children "on time." Moreover, this effect was stronger in more traditionalist countries (Zoutewelle-Terovan & Liefbroer, 2018).

Fortunately, despite the multiple challenges and variable events of midlife, many middle-aged adults show remarkable resilience (Ryff et al., 2012). In the Issues and Themes at Midlife section, we focus on the psychosocial challenges of midlife, on how people resolve their changing identity, and on the maintenance of psychological well-being and positive mental health during aging.

Research suggests that people who are required to wear a uniform at work have lower morbidity than those who can wear what they choose. The researchers suggest that clothing is often an environmental cue to aging, and uniforms, because everyone must wear the same thing, remove that cue and thereby prime improved health (Hsu et al., 2010).



## checkpoint can you . . .

- Summarize important changes that occur at midlife, according to normative, trait, and timing-of-events theory and research?
- Tell how historical and cultural changes have affected the social clock for middle age?

# Issues and Themes at Midlife

Whether we look at middle-aged people objectively, in terms of their outward behavior, or subjectively, in terms of how they describe themselves, certain issues and themes emerge.

## THE MIDLIFE CRISIS?

The middle-aged man who impulsively buys an expensive sports car or the woman who suddenly leaves her job and home to travel to find herself are familiar stereotypes. Often, changes in personality and lifestyle such as these during the early to middle forties are attributed to what has been called a **midlife crisis**. At about this age, many people realize that they will not be able to fulfill the dreams of their youth or that fulfillment of their dreams has not brought the satisfaction they expected, and they become more aware of their own mortality. The midlife crisis is a supposedly stressful period triggered by this review and reevaluation of one's life.

Although some researchers disagree with the interpretation of the data, there is both longitudinal and cross-sectional evidence from developing and developed countries that, on average, adults' well-being gradually drops until about 50 years of age. At that point, it gradually increases until at least the age of 70, although this shift occurs sooner for those people who are temperamentally higher in well-being or who come from countries with higher levels of well-being as a whole (Blanchflower, 2021; Graham & Pozuelo, 2017).

Despite the midlife dip in well-being, the term *midlife crisis* is now considered an inaccurate representation of what most people experience (Wethington, 2000). Crises are not experienced only during midlife, although they are somewhat more common during that time, and not all people experience them. For example, from their twenties to their forties, 39 to 46 percent of men and 49 to 59 percent of women report a crisis (Robinson & Wright, 2013). People who do have crises at midlife generally also have crises at other times in their lives as well, so a midlife crisis may be a manifestation of a neurotic personality rather than a developmental phase (Lachman et al., 2015).

### midlife crisis

In some normative-crisis models, stressful life period precipitated by the review and reevaluation of one's past, typically occurring in the early to middle forties.



As far as you know, did one or both of your parents go through what appeared to be a midlife crisis? If you are middle-aged or older, did you go through such a crisis? If so, what issues made it a crisis? Did it seem more serious than transitions at other times of life?

Crises can be triggered by a variety of precipitating events, including death of a loved one, increasing illness of self or others, extramarital affairs, an empty nest, divorce, and being sandwiched between young children and aging parents (Wethington, 2000). The resources available to people—whether social or personal—also influence the likelihood of a midlife crisis. For example, in one study, older Korean adults with higher education and economic status were less likely to experience a midlife crisis, whereas poor health, low social support, and high stress were associated with a greater likelihood of experiencing a midlife crisis (Chang, 2018). Similarly, men experiencing family stress, especially if they were low in self-efficacy, were more likely to report being in a midlife crisis (Kwon & Oh, 2021). Generally, men report more crises centered upon work, whereas women report more concerns regarding relationships and family issues (Robinson & Wright, 2013).

Recent research with chimpanzees and orangutans shows an inverted U-shaped curve for well-being. Researchers have interpreted this as suggesting that, just like us, some great apes experience a midlife crisis of sorts (Weiss et al., 2012).



#### turning points

Psychological transitions that involve significant change or transformation in the perceived meaning, purpose, or direction of a person's life.

#### midlife review

Introspective examination that often occurs in middle age, leading to reappraisal and revision of values and priorities.

#### ego resiliency

(1) Dynamic capacity to modify one's level of ego-control in response to environmental and contextual influences. (2) The ability to adapt flexibly and resourcefully to potential sources of stress.

#### identity process theory (IPT)

Whitbourne's theory of identity development based on processes of assimilation and accommodation.

#### identity schemas

Accumulated perceptions of the self shaped by incoming information from intimate relationships, work-related situations, and community and other experiences.

#### identity assimilation

Whitbourne's term for effort to fit new experience into an existing self-concept.



A midlife review might inspire a woman who senses her biological clock ticking to move forward on her wish to have a child.

thechatat/Shutterstock

It may be better to consider midlife a

**turning point**—a psychological transition that involves significant change or transformation in the perceived meaning, purpose, or direction of a person's life. Turning points may be triggered by major life events, normative changes, or a new understanding of past experience, either positive or negative, and they may be stressful. However, in studies of resilience, many respondents reported positive growth from successful resolution of life challenges (Ryff et al., 2012).

Turning points often involve an introspective review and reappraisal of values and priorities (Bauer & McAdams, 2004). The **midlife review** involves recognizing the finiteness of life and can be a time of taking stock, discovering new insights about the self, and spurring midcourse corrections in the design and trajectory of one's life. However, it can also involve regret over failure to achieve a dream or a keener awareness of developmental deadlines—time constraints on, say, the ability to have a child or to make up with an estranged friend or family member (Heckhausen, 2001).

Whether a turning point becomes a crisis may depend less on age than on individual circumstances and personal resources. People with **ego resiliency**—the ability to adapt flexibly and resourcefully to potential sources of stress—and those who have a sense of mastery and control are more likely to navigate the midlife crossing successfully (Heckhausen, 2001; Lachman, 2004; Kremen et al., 2012). They recover from stress more rapidly (Tugade et al., 2004), are less likely to become depressed after experiencing a trauma (Frederickson et al., 2003), and are less likely to experience a midlife crisis (Chang, 2018). For people with resilient personalities, even negative events, such as an unwanted divorce, can become springboards for positive growth (Klohnen, 1996; Moen & Wethington, 1999) (see Table 1).

## IDENTITY DEVELOPMENT

In this section, we discuss identity processes. First, we discuss the narrative approach to identity development. Then, we discuss cognitive aspects of shifting identity in midlife as informed by Piaget's work. Last, through the lens of Erikson's work, we discuss the particular issues women face in this area.

**Narrative Psychology** We all carry with us the story of who we are. The field of narrative psychology views the development of the self as a continuous process of constructing one's life story—a dramatic narrative to help make sense of one's life and connect the past and present with the future (McAdams, 2006). This evolving story provides a person with

**TABLE 1** Characteristics of Ego-Resilient Adults

Most Characteristic	Most Uncharacteristic
Has insight into own motives and behavior	Has brittle ego-defense; maladaptive under stress
Has warmth; capacity for close relationships	Is self-defeating
Has social poise and presence	Is uncomfortable with uncertainty and complexities
Is productive; gets things done	Overreacts to minor frustrations; is irritable
Is calm, relaxed in manner	Denies unpleasant thoughts and experiences
Is skilled in social techniques of imaginary play	Does not vary roles; relates to all in same way
Is socially perceptive of interpersonal cues	Is basically anxious
Can see to the heart of important problems	Gives up and withdraws from frustration or adversity
Is genuinely dependable and responsible	Is emotionally bland
Responds to humor	Is vulnerable to real or fancied threat; fearful
Values own independence and autonomy	Tends to ruminate and have preoccupying thoughts
Tends to arouse liking and acceptance	Feels cheated and victimized by life
Initiates humor	Feels a lack of personal meaning in life

Note: These items are used as criteria for rating ego-resiliency, using the California Adult Q-Set.

Source: Adapted from Block (1991), as reprinted in Klohnen (1996).

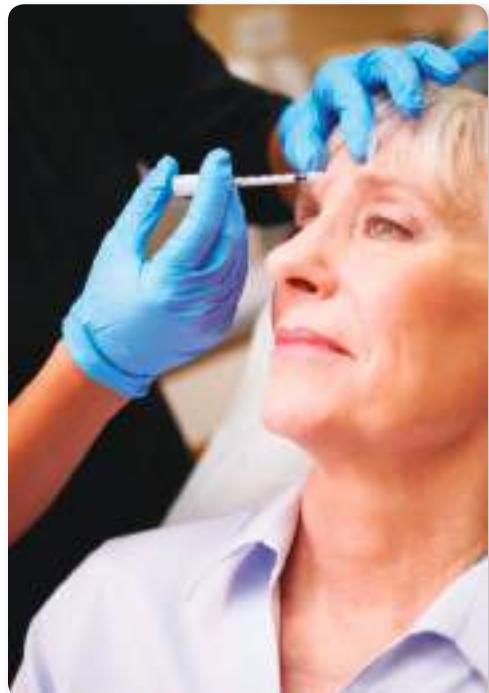
a “narrative identity” (Singer, 2004). Indeed, some narrative psychologists view identity itself as this internalized script or story. People follow the script they have created as they act out their identity (McAdams et al., 1997). Midlife often is a time for revision of the life story (McAdams, 1993; Rosenberg et al., 1999).

Studies in narrative psychology are based on a standardized 2-hour life-story interview. The participant is asked to think of his or her life as a book, to divide the book into chapters, and to recall eight key scenes, each of which includes a turning point. Research using this technique has found that people’s scripts tend to reflect their personalities (McAdams, 2006).

Highly generative adults tend to construct generativity scripts. These scripts often feature a theme of redemption, or deliverance from suffering, and are associated with psychological well-being. In one such story, a nurse devotes herself to the care of a good friend during a fatal illness. Although devastated by her friend’s death, she comes out of the experience with a renewed sense of confidence and determination to help others (McAdams, 2006). The tendency to develop narratives in which events are generally interpreted as being positive and negative events are closely examined and processed for their meaning is associated with well-being and adjustment (Lilgendaal & McAdams, 2011; Weststrate & Glück, 2017).

**Identity Process Theory** According to the **identity process theory (IPT)** (Whitbourne, 1996), physical characteristics, cognitive abilities, and personality traits are incorporated into **identity schemas**. These self-perceptions are continually confirmed or revised in response to incoming information (see Research in Action).

Piaget described two processes that have been applied toward understanding identity development. Assimilation is the interpretation of new information via existing cognitive structures. Accommodation involves changing cognitive structures to more closely align with what is encountered. **Identity assimilation**



The popularity of regular Botox injections to temporarily smooth lines and wrinkles may express what Whitbourne calls an assimilative identity style.

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# research in action

## BODY IMAGE AND WELL-BEING AT MIDLIFE

Bodies change. From growth spurts and breast development during puberty, to loss of lean muscle tissue and fat gain in middle adulthood, body size and shape change over the lifespan via metabolic and cellular adaptations (Tchkonia et al., 2010). In our appearance-obsessed culture, however, these changes are not all met with acceptance. External changes to the body—especially weight changes—can influence the way that others see and treat us and our own self-perceptions, our identity.

Identity has been conceptualized as a social process, influenced by how people believe they are viewed by others, particularly relevant to socially undesirable aspects of the self (Schafer & Ferraro, 2011). As such, body size is an acutely pronounced identity for those who live in, or develop, larger bodies (Hunger et al., 2015). This is because weight stigma, or the social degradation of those perceived as carrying “excess” weight, persists as a socially acceptable and pervasive form of prejudice (Andreyeva et al., 2008). Higher-weight adults encounter stigma at individual, interpersonal, and structural levels and across a broad range of settings. These experiences are exceedingly harmful to the mental and physical health of targeted individuals (Tylka et al., 2014).

One might ask: “Why not just lose weight?” The prevailing cultural narrative that weight is controllable drives weight stigma as it assigns blame to larger-bodied individuals (Crandall, 1994). Indeed, studies demonstrate that weight is determined by a complex interplay between genetic and environmental factors and is largely outside of one’s control (Silventoinen et

al., 2010), with weight loss strategies resulting in weight regain for most individuals (Wing & Phelan, 2005). Far from a risk-free venture, the weight fluctuations resulting from dieting are associated with heightened mortality risk, particularly for mid-aged adults (Taing et al., 2012).

The movement toward weight-inclusive approaches to health and well-being is gaining public traction and empirical support. In particular, the Health at Every Size® model is a nondiet approach that promotes body acceptance and the adoption of healthy behaviors for the sake of improved well-being rather than weight manipulation. Studies have demonstrated that this approach yields improvements in physiological health (e.g., blood pressure), health behaviors (e.g., disordered eating), and psychosocial outcomes (e.g., body image, depression) (Bacon & Aphramor, 2011). Improvements in body image and self-esteem (Bacon et al., 2005) may reduce identity distress and buffer against the harmful effects of weight stigma, but these mechanisms are yet to be examined empirically. Nevertheless, when encountering weight gain in midlife and otherwise, the most health-promoting and nurturing option may be acceptance.



How have you been personally impacted by socially constructed body ideals and weight stigma? What beliefs or assumptions have you directed toward yourself and others as a result?

### identity accommodation

Whitbourne’s term for adjusting the self-concept to fit new experience.

### identity balance

Whitbourne’s term for a tendency to balance assimilation and accommodation.

involves holding onto a consistent sense of self in the face of new experiences that do not fit the current understanding of the self. Contradictory or confusing information is absorbed without changing one’s identity schema. **Identity accommodation**, in contrast, involves adjusting the identity schema to fit new experiences. Here, discontinuity of the self is the result because identity accommodation involves changing the understanding of the self.

Overuse of either assimilation or accommodation is unhealthy. People who constantly assimilate may seek to maintain a youthful self-image and ignore what is going on in their body. This process of denial may make it harder for them to confront the reality of aging when it can no longer be ignored. By contrast, people who constantly accommodate are weak and highly vulnerable to criticism. Their identity is easily undermined. They may overreact to early signs of aging, such as the first gray hair, and their pessimism may hasten physical and cognitive declines. Ideally, people are able to achieve **identity balance** and maintain a stable sense of self while adjusting their self-schemas to incorporate new information, such as the effects of aging. People who achieve identity balance recognize changes and respond flexibly; they seek to control what can be controlled and accept what cannot.



## checkpoint can you . . .

Overall, both identity assimilation (to a point) and identity balance are associated with positive effects on health, well-being, and perceptions of aging (Sneed & Whitbourne, 2005), and identity accommodation is associated with declines in self-esteem (Skultety & Whitbourne, 2004). However, culture can affect this process. For example, American, German, and Norwegian adults all rate themselves as feeling younger than their chronological age, presumably as a means by which to maintain self-esteem. However, this effect is larger in Americans than in Germans and Norwegians. Moreover, whereas in Germans and Americans, feeling younger than actual age is associated with increases in life satisfaction and positive affect, only in Americans does it also influence negative affect. Last, Americans are more likely to use assimilative identity processes than Norwegians, suggesting they are more reluctant to incorporate beliefs about aging into their self-concept. These results are all consistent with American culture's greater emphasis on health and youth (Westerhof et al., 2003; Westerhof & Barrett, 2005).

**Generativity and Identity Processes in Women** A particularly fruitful place to examine the intersection of generativity and identity is with respect to balancing the demands of work and family, something that is generally more difficult for women than men (Allen & Finkelstein, 2014). The process of fulfilling multiple roles, which for women may involve challenging traditional norms and stereotypes, is one that is likely to affect identity processes. Moreover, work and children are areas in which people often seek generative action. Last, bodily changes common at midlife can affect identity as well. Thus, most work on generativity and identity processes has focused on women.

Research has found that for women, inhabiting multiple roles early in life—whether or not they were married, had children, or worked outside the home—impacted identity development. Those women who filled more social roles were more likely to develop a firm sense of identity, and, once developed, their identity balance was associated with generativity and, consequently, well-being, psychological health, and successful resolution of work-family conflict (Vandewater et al., 1997; DeHaan & MacDermid, 1994; Peterson & Stewart, 1996).

Once established, generativity paves the way for positive life outcomes. For instance, generativity has been associated with positive feelings about marriage, motherhood, and the care of aging parents, and an increased certainty about identity and sense of confidence late in life (Peterson & Duncan, 2007; Peterson, 2002; Zucker et al., 2002). The relationship between identity and generativity may also affect behavior. In a study comparing environmental activists and nonactivists, identity maturity was associated with more activism. Presumably, this was because having a mature identity motivated individuals to act in more a generative fashion (Matsuba et al., 2012). These behaviors can have long-term health consequences. In one study, highly generative people from the ages of 60 to 75 years were found to have more frequent social contact with and provide more support to others, volunteer more, have lower levels of negative affect, be more likely to be married, have higher levels of education, and be less likely to smoke, all variables that affect health. Over the course of 10 years, they were also found to have a lower risk of impairment in activities of daily living or mortality (Gruenewald et al., 2012).

## POSITIVE MENTAL HEALTH AT MIDLIFE

Positive mental health involves life satisfaction and a sense of psychological well-being, which goes hand in hand with a healthy sense of self.

**Life Satisfaction** Although many international surveys originally reported that most adults of all ages, genders, and races report being satisfied with their lives (Myers, 2000; Walker et al., 2003), more recent data suggest that when very poor or troubled nations are included in analyses, we cannot characterize all people as being satisfied with their lives. However, it is still the case that the majority of societies meet enough basic human needs so that happiness is the default condition for people in many cultures (Diener et

- Compare the concepts of the midlife crisis and of turning points and discuss their relative prevalence?
- State typical concerns of the midlife transition and factors that affect how successfully people come through it?
- Summarize Whitbourne's identity process theory, and tell how identity assimilation, identity accommodation, and identity balance differ, especially in response to signs of aging?



## checkpoint can you . . .

- Explain the connection between generativity and identity, and discuss research on generativity and age?
- Explain the concept of identity as a life story and how it relates to generativity?



We get more nostalgic as we age. One of the consequences of this is it makes us more susceptible to advertisements that appeal to nostalgia and more likely to purchase an item (Kusumi et al., 2010).

al., 2018). One reason for this general finding of life satisfaction under many circumstances is that the positive emotions associated with pleasant memories tend to persist, whereas the negative feelings associated with unpleasant memories fade. After either especially happy or distressing events, such as marriage or divorce, most people generally adapt, and subjective well-being returns to, or close to, its previous level (Lucas et al., 2003; Diener, 2000).

Social support—friends and spouses—and religiosity are important contributors to life satisfaction (Diener, 2000; Myers, 2000). These effects are interactive. So, for instance, having good social relationships makes people happier, which then results in better social relationships (Lyubomirsky et al., 2005). Personality dimensions—extraversion, emotional stability, and conscientiousness (Duckworth et al., 2012)—have also been found to affect life satisfaction.

Many adults spend the majority of their waking hours working; thus, work is clearly an influence on life satisfaction. And the relationship between work and life satisfaction is interactive: Being happy at work is associated with higher life satisfaction, which then predicts work productivity and occupational commitment (Erdogan et al., 2012). Not surprisingly, income affects life satisfaction as well. Adults who make more money report higher life satisfaction, and this relationship is strongest in middle adulthood (Cheung & Lucas, 2015). Moreover, people in wealthier nations report greater subjective well-being than those in poorer nations (Ng & Diener, 2018). However, purchasing material goods does not increase life satisfaction, although spending money for experiences does. This may be because experiences enhance social relations more than material goods and are more likely to be incorporated into the self-image (Gilovich et al., 2015). Exercise is also associated with life satisfaction (Maher et al., 2015), although this association may be driven by overall physical health, as healthier people are more likely to engage in physical activity.

Research on the COVID-19 pandemic showed an initial sharp decline in well-being in many adults. Specifically, in the first few months, negative affect rose sharply, with the rate of change decelerating over time. However, positive affect also rose. The researchers theorized this process was the consequence of COVID-19 calibrating people's emotional set point to a "new normal" (Ebert et al., 2020).



Although a majority of older adults report rising levels of life satisfaction as they age, this is certainly not the case for every adult. Adults who report poor social relationships and a lack of a sense of control tend to report declines in life satisfaction (Rocke & Lachman, 2008). There are also developmental changes that can best be described as fitting a U-shaped curve. Generally, life satisfaction is lower in early adulthood, rises in mid-adulthood, and then declines again in late adulthood (Maher et al., 2015; Mroczek & Spiro, 2005; Helson & Wink, 1992). This may in part be driven by how adults feel about themselves as self-esteem shows a path similar to that of life satisfaction, suggesting a link between the two. Self-esteem seems to increase until middle adulthood, peak at 60 years of age, and then decline (Orth et al., 2010).

**Well-Being** Within the discipline of psychology, a subjective sense of happiness is characterized as well-being. Although people generally have an overall sense of how happy they are, happiness is multidimensional, and people can be more or less pleased with various aspects of their life. Carol Ryff and colleagues developed a model that includes six dimensions of well-being referred to as the Ryff Well-Being Inventory (Ryff, 1995). The model includes six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Those who score higher on these dimensions may have a stronger sense of well-being than those who score lower.

Studies using Ryff's scale have shown midlife to be a period of generally positive mental health. In cross-sectional research, middle-age people were more autonomous than younger adults but less purposeful and less focused on personal growth—future-oriented dimensions that declined in late adulthood. Environmental mastery, on the other hand, increased for all groups over time. Self-acceptance was relatively stable for all age groups. Overall, men's and women's well-being were quite similar, but women had more positive social relationships (Ryff & Singer, 1998; Ryff, 2014; Springer et al., 2011).

When Ryff's scale was used to measure the psychological well-being of BIPOC, the collective portrait replicated these age-related patterns. However, Black and Hispanic women scored lower than Black and Hispanic men in several areas. But when employ-

ment and marital status were controlled, minority status predicted positive well-being in several areas, even when education and perceived discrimination were accounted for. It may be that such factors as self-regard, mastery, and personal growth are strengthened by meeting the challenges of minority life (Ryff et al., 2004).

Research suggests that more recent immigrants to the United States may be more physically and mentally healthy than those who come from families who have been here for two or more generations. Resistance to assimilation may promote well-being in first-generation immigrants, especially in the domains of autonomy, quality of relationships, and purpose in life. Researchers have proposed the term *ethnic conservatism* for this tendency to resist assimilation and cling to familiar values and practices that give meaning to life. Ethnic conservatism is less effective in promoting well-being among the second generation, who may find it harder to resist the pull of assimilation (Horton & Schweder, 2004). By contrast, bicultural identity—being able to identify with both minority and majority cultures—is associated with well-being (Yamaguchi, et al., 2016; Ferrari et al., 2015).

**Emotional Influences on Well-Being** Many studies have found a gradual decline in negative emotions and an increase in positive emotions through early adulthood to old age (Mroczek, 2004; Carstensen et al., 2011; Diehl et al., 2011). Generally, increasing age is associated with more effective emotional regulation, greater emotional well-being, and more co-occurrence of positive and negative emotions (Carstensen et al., 2011).

The ability to regulate emotions has implications for the stressors of daily life. Younger adults show greater individual variation in emotionality than older adults. In other words, while average levels of emotionality are similar in both younger and older adults, older adults show less of a positive rise in response to positive events but also less of a negative rise to negative events (Röcke et al., 2009). However, younger adults may experience more stressful events than older adults. When adults of different ages are matched for the number of daily stressors they experience, some of the variability in emotional responses is reduced (Brose et al., 2013).

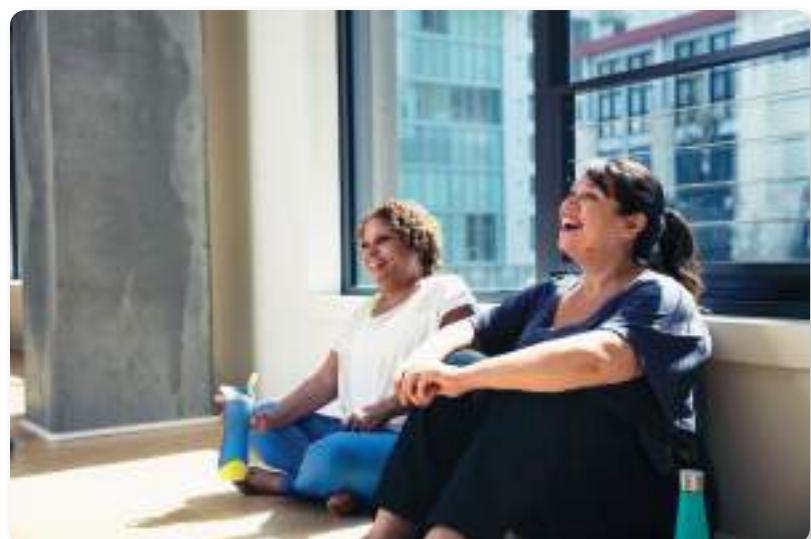
Relationships can also affect emotional experiences and hence stress. Married people at midlife tended to report more positive emotions and fewer negative emotions than unmarried people (Mroczek, 2004), but the quality of the relationship affects this process. Continuously married people, and especially those who reported an increase in marital satisfaction over time, showed markers associated with good cardiovascular health when compared to remarried adults. This suggests that the marital discord and strain experienced by the remarried adults had lasting effects on their health (Donoho et al., 2015).

Subjective well-being (how happy a person feels) is also related to personality traits, especially neuroticism. People who are high in neuroticism are more likely to experience a low sense of subjective well-being. High extraversion and conscientiousness, by contrast, are associated with high subjective well-being (Weiss et al., 2008; Anglim & Grant, 2016; Grant et al., 2009).

There are some normative developmental trends in personality. Specifically, in adulthood, people generally show increases in agreeableness, conscientiousness, and emotional stability and decreases in extraversion, neuroticism, and openness to experience (Roberts et al., 2006; Milojev & Sibley, 2017). However, people also show individual change, which can be a response to their unique life trajectory, and these factors interact with each other. For instance, people high in



Just like emotionality, self-esteem (Meier et al., 2011) and personality (Milojev & Sibley, 2014) become more stable with age.



Many women greet middle age with verve, humor, and élan.

Cavan Images/Getty Images

extraversion, agreeableness, emotional stability, and openness to experience are likely to also be high in well-being. And increases in well-being over time predict increases in extraversion, agreeableness, emotional stability, and openness to experience. Thus, some people may be more well-suited to positively and adaptively addressing the challenges of midlife (Hill et al., 2012).

**Religiosity and Well-Being** Generally, religion has a positive influence on well-being (Green & Elliot, 2010). However, contextual variables affect these processes. When religion is widely and freely practiced by a population or when religion is highly regulated by the government but normative in the population, then religion is positively associated with health and happiness. However, when religion is rare in a population and when the government restricts religious practices, it is then associated with negative effects on well-being (Hayward & Elliot, 2014). There is a caveat. A study conducted with immigrant populations across the United States, Australia, and Western Europe found positive effects for the relationship between religion and well-being for all religious immigrant groups in all countries (Connor, 2012). It may be that acculturation involves unique stressors—including discrimination, financial strain, acculturation, disruptions in relationships and uncertainty about status—for which religion offers succor.

In much of Europe and the United States, the proportion of people who do not identify with any religion has been rising, especially in younger cohorts (Lipka & McClendon, 2017). Most studies show the religiously unaffiliated with lower levels of well-being, some studies show no differences, and others show a benefit to being unaffiliated (Zuckerman, 2009; Weber et al., 2012). Some of the discrepancy may be driven by which particular atheists and agnostics are assessed. Research on atheists and agnostics found a curvilinear relationship between religious belief and atheism. People who strongly and confidently believed in religion were more likely to be high in well-being, but so were those who strongly and confidently believed in their atheism. Those people who were unsure showed lower levels of well-being (Galen & Kloet, 2011).

Previous research has suggested that the positive effects of religion may be mediated by transcendent emotions. In other words, religion leads to emotions such as awe, love, peace, and gratitude, which then exert a positive influence on well-being (Van Cappellen et al., 2016). However atheists, too, experience these emotions. For example, one study examining atheists, Buddhists, and Christians found similar levels of well-being in all groups. But, rather than citing spiritual or magical beliefs as the cause, atheists reported finding meaning and purpose in life through logic and rationality. They also reported feeling awe, wonder, and joy, not through participation in religious activities, but through nature, art, science, music, and the appreciation of humanity (Caldwell-Harris et al., 2011).

## checkpoint can you ...

- ▶ Explain the concept of positive mental health?
- ▶ Discuss age trends in emotionality, personality, life satisfaction, and psychological well-being?
- ▶ Explain the importance of a multifaceted measure of well-being, and name and describe the six dimensions in Ryff's model?

# Relationships at Midlife

It is hard to generalize about the meaning of relationships in middle age today. Not only does that period cover a quarter-century of development, it also embraces a greater multiplicity of life paths than ever before.

## THEORIES OF SOCIAL CONTACT

According to **social convoy theory**, people move through life surrounded by social convoys: circles of close friends and family members of varying degrees of closeness, on whom they can rely for assistance, well-being, and social support, and to whom they in turn offer care, concern, and support. This support network and the satisfaction derived from it contribute to health and well-being (Antonucci et al., 2014).

Generally, the size of the social network peaks in young adulthood and declines thereafter. The declines in size are primarily seen in friendship networks; the size of the family network remains relatively stable over time. Researchers have variously described

### **social convoy theory**

Theory, proposed by Kahn and Antonucci, that people move through life surrounded by concentric circles of intimate relationships on which they rely for assistance, well-being, and social support.

this decline in friendship networks as due to changing circumstances (e.g., the increase in time demands of work and family life) or motivational goals (e.g., staying most close to people who help us regulate emotions) (Wrzus et al., 2013).

The size of the friendship network is also affected by culture. People from individualistic cultures have larger friendship networks. Because individualism places less emphasis on the in-group, adults from individualistic countries place more value on relationships outside the family and sometimes use friends rather than family to fulfill relationship needs. Other relationships, such as those with coworkers or neighbors, tend to be important during particular times. For example, when changing jobs or moving, people in the social network may drop out, or new people may be included (Wrzus et al., 2013). Late in adulthood, if family demands decline, women are more likely than men to add new social network members (Schwartz & Litwin, 2018).

Another approach, **socioemotional selectivity theory** (Carstensen, 1991), assumes we select our friends based on their ability to meet our goals. According to this approach, social interaction has three main goals: (1) it is a source of information; (2) it helps people develop and maintain a sense of self; and (3) it is a source of emotional well-being. An important component is the time horizon. The knowledge that time is limited shapes which goal is primary. Specifically, the knowledge that time is short generally pushes people's preferences toward emotionally meaningful partners (Carstensen, 2021).

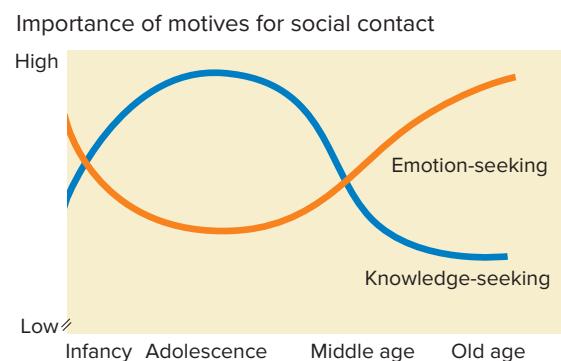
In infancy, the need for emotional support within relationships is paramount. From childhood through young adulthood, information-seeking comes to the fore. By middle age, although information-seeking remains important (Fung et al., 2001), the original, emotion-regulating function of social contacts begins to reassert itself. In other words, middle-aged people increasingly seek out others who make them feel good (Figure 1). For instance, although their social networks are smaller than those of younger adults, older adults describe their social network members more positively and less negatively, suggesting older adults chose to limit their interactions to those people whom they find to be emotionally fulfilling and supportive (English & Carstensen, 2014; Carmichael et al., 2015).

## RELATIONSHIPS AND WELL-BEING

For most middle-aged adults, relationships are key to well-being (Thomas et al., 2017). For example, social support from spouses and to a lesser extent from children and friends is related to well-being in older adults (Chen & Feeley, 2014; Lee & Szinovacz, 2016), and social support is related to life satisfaction at all ages (Siedlecki et al., 2014).

However, relationships, or the lack of them, can also present stressful demands. Being single, divorced, or widowed is associated with depression, loneliness, and decreases in happiness (Koropeckyj-Cox et al., 2007). Having a tense relationship with a spouse, mother, or sibling, in other research, was also associated with a risk of depression, especially for women (Gilligan et al., 2017). This may be because women tend to feel a greater sense of responsibility and concern for others. This may impair a woman's well-being when problems or misfortunes beset others; men are less likely to be affected in this way. This greater concern for the welfare of others may also help explain why across a variety of cultures, middle-age women tend to be unhappier with their marriages than are men (Heiman et al., 2011).

In studying midlife social relationships, we need to keep in mind that their effects can be both positive and negative (Arnett, 2018; Lee & Szinovacz, 2016). In the remaining sections of this chapter, we examine intimate relationships in the middle years. We look first at close relationships, addressing variations in sexual orientation and differing cultural views on marriage. Then, we discuss cohabiting partners and friends, bonds with maturing children, and, last, ties with aging parents, siblings, and grandchildren.



**FIGURE 1**  
How Motives for Social Contact Change across the Life Span

According to socioemotional selectivity theory, infants seek social contact primarily for emotional comfort. In adolescence and young adulthood, people tend to be most interested in seeking information from others. From middle age on, emotional needs increasingly predominate.

Source: Carstensen (1991).

**socioemotional selectivity theory**  
Theory, proposed by Carstensen, that people select social contacts on the basis of the changing relative importance of social interaction as a source of information, as an aid in developing and maintaining a self-concept, and as a source of emotional well-being.

## checkpoint can you . . .

- Summarize two theoretical models of the selection of social contacts?
- Discuss how relationships can affect quality of life in middle adulthood?

# Consensual Relationships

Marriages, cohabitations, same-sex unions, and friendships typically involve two people of the same generation who mutually choose each other. Much of the research conducted in this area is limited by a focus on cisgender, heterosexual relationships and may not necessarily apply to people who identify differently. However, when possible, research of a more inclusive nature is addressed as well.

## MARRIAGE

How many longtime happily married couples do you know? Can you tell whether their marriages followed patterns similar to those mentioned in this section?

A diamond isn't forever. The more money spent on an engagement ring and wedding, the less time a marriage is likely to last (Francis-Tan & Mialon, 2015).

Midlife marriage is very different from what it used to be. When life expectancies were shorter, couples who remained together for 25, 30, or 40 years were rare. The most common pattern was for marriages to be broken by death and for survivors to remarry. Additionally, people had many children and expected them to live at home until they married. It was unusual for a middle-aged husband and wife to be alone together. Today, more marriages end in divorce, but couples who stay together can often look forward to 20 or more years of married life after the last child leaves home.

Researchers used to believe that marriages followed a U-shaped curve, where marriages were marked by declining levels of satisfaction until roughly 2 decades in, upon which time marriages would begin to once again turn more positive. By the third and fourth decade, it was believed, marital satisfaction was as high as in the first few years of marriage (Rollins & Feldman, 1970; Orbuch et al., 1996). However, it now appears this was incorrect. Marriages generally follow a developmental sequence, with initial sharp declines in marriage satisfaction followed by a plateau, then further, slower declines over the longer term. Not surprisingly, people who divorce report even lower marital satisfaction (Bradbury et al., 2000; Kurdek, 1999).

The birth of a child has been consistently found to negatively impact marital satisfaction (Twenge et al., 2003). Both mothers and fathers report a decline in satisfaction following this event, although many couples rebound as children get older and somewhat more self-sufficient, and particularly when they enter primary school (Keizer & Schenck, 2012). Marital satisfaction can also suffer in middle age, when many couples have teenage children and are heavily involved in careers (Orbuch et al., 1996). Despite the stereotypes surrounding the empty nest, the departure of children from the family home is usually met with an average rise in marital satisfaction for parents, although it also increases the risk of marital dissolution slightly (Bouchard, 2014). Satisfaction usually reaches a high when children are grown, many people are retired or entering retirement, and a lifetime accumulation of assets helps ease financial worries (Orbuch et al., 1996).

Sexual satisfaction affects marital satisfaction and stability. Those couples who are satisfied with their sex lives tend to be satisfied with their marriages (Fallis et al., 2016), and better marital quality leads to longer marriages for both men and women (Yeh et al., 2006). Similar results have been found in Brazil, Germany, Spain, Japan, and the United States (Heiman et al., 2011).

**Gay and Lesbian Relationships** In the United States, same-sex marriage became the law of the land on June 26, 2015. Same-sex marriage is also legal across most countries in Western Europe, and the vast majority of adults in those countries support marriage equality. Overall, 30 countries and territories around the globe support marriage equality (Pew Research Center, 2019). In 2019, Taiwan became the first Asian country to grant legal recognition to gay marriage (Lipka & Masci, 2019). However, in Central and Eastern Europe, many people remain opposed to gay marriage, and most of the countries in those regions have not legalized it. Thus, although social and legal protections for people with alternative sexualities have improved in the last decade, much work still remains to be done. In particular, more research is required into these relationships.

Most gays and lesbians now in middle age grew up at a time when homosexuality was not as accepted as it is now. At that time, gays and lesbians tended to be isolated

not only from the larger community but also from each other. It was not until the 1990s that acceptance of homosexual relationships began to increase sharply, and the general public's negative perception of gays and lesbians became more positive (Keleher & Smith, 2012; Hicks & Lee, 2006).

One factor that seems to affect relationship quality in gays and lesbians is whether or not they have internalized society's negative views on homosexuality. Although relationship quality is as high in same-sex couples as in heterosexual couples (Perales & Baxter, 2018), gay and lesbian individuals who have internalized a negative view of their sexuality report lower relationship quality (Cao et al., 2017; Frost & Meyer, 2009). This may be because when faced with an episode of discrimination—which is common for sexual minorities—gays and lesbians who have internalized negative beliefs about themselves are more likely to respond with anxiety or depression (Feinstein et al., 2012). These processes are magnified in people of color, who may experience both homophobia and racism (Reczek, 2020). Even in the absence of precipitating events, gays and lesbians who have internalized the homophobic attitudes held by others are more likely to show symptoms of depression. When depressive symptoms increase, so do relationship issues (Frost & Meyer, 2009).

Coming out can be a challenging process. Some middle-aged gays and lesbians may be still working out conflicts with parents and other family members (sometimes including spouses) or hiding their sexual orientation from them. Some move to cities with more diverse populations where they can more easily seek out and form relationships. While times have changed and society is more accepting of same-sex relationships, many older gays and lesbians are still reluctant to fully come out. For example, one relatively recent study showed that about a third of older adults still feared being completely open about their sexuality (Gardner et al., 2014).

Given the already established findings for heterosexual couples, do the same dynamics exist in gay and lesbian couples? While more work needs to be done, initial data on marriage equality show that gay and lesbian couples also benefit from marriage. Although bisexual adults, married or not, tend to fare worse, gay and lesbian couples who marry do not differ on health indices from their heterosexual counterparts (Liu et al., 2021; Wight et al., 2013). As with heterosexual couples, marriage seems to have a greater effect on well-being than cohabitation (Chen & van Ours, 2018). Presumably, the same factors that influence health and well-being in heterosexual marriages are affecting homosexual and bisexual marriages as well.

However, there is also a more direct pathway from marriage to health: health insurance. Prior to marriage equality laws, same-sex couples were often excluded from their partners' health insurance coverage, even in relatively accommodating states specifying guidelines for civil unions (Ponce et al., 2010). Once marriage was possible, many more people became eligible for health insurance through their same-sex spouses. Thus, following the passage of marriage equality laws, gay and lesbian couples showed increases in health insurance coverage rates and access to health care, and research showed evidence for greater utilization of preventive health care outcomes for men (Carpenter et al., 2018; Downing & Cha, 2020).

Earlier research suggested gay and lesbian couples were more likely to break up than heterosexual couples, but as marriage was unavailable to many, data were scarce and the studies had methodological problems. More recent nationally representative US data suggest that both heterosexual and homosexual couples have similar rates of relationship duration and stability (Rosenfeld, 2014).

**Arranged Marriages** In countries such as the United States, marriages are generally based on love. However, in many countries, arranged marriages are the norm. Arranged marriages are partnerships formed between families where parents of the husband- and wife-to-be negotiate the marriage, basing the union on pragmatic concerns including socioeconomic status, religion, family values, and physical appearance. Arranged marriages are more common in collectivistic cultures, where family bonds are viewed as more important than individual desires.



*Relationship quality is as high in same-sex couples as it is in heterosexual couples.*

Lars A. Niki

Although arranged marriages are declining in some countries (Rubio, 2013), they remain common in many parts of the world. However, in the modern era, the husband-and wife-to-be are more often given veto power over potential marriage partners and are more active participants in the marriage decision process (Allendorf & Pandian, 2016). Although data are scarce, the available research indicates that adults in arranged marriages show similar levels of marital satisfaction as do those in love marriages. For example, studies on love-based and arranged marriages in Indian couples living either in the United States or in India show no differences in their levels of marital satisfaction (Regan et al., 2012; Myers et al., 2005). However, parents' opinions still seem to matter. A study of different types of marriages in Pakistan showed that adults in love and arranged marriages were equally satisfied as long as their parents approved of the decision. However, those adults in love marriages where parents did not approve of the match had lower marital satisfaction (Arif & Fatima, 2015).

**Marriage and Health** Across a large number of studies, married people at midlife appear to be healthier, both physically and mentally, and they tend to live longer than single, separated, or divorced people. Although these results are more modest than initially thought, they nonetheless exist across a large number of countries and cultures, in both cross-sectional and prospective studies (Tantagelo et al., 2017; Umberson et al., 2013; Kaplan & Kronick, 2006; Wang et al., 2020). In one recent meta-analysis of 126 studies, including more than 72,000 individuals from the United States, Brazil, Canada, China, Finland, Germany, Hong Kong, Israel, Netherlands, Sweden, and the United Kingdom, marital quality was associated with better health and lower cardiovascular reactivity during marital conflict (Robles et al., 2014). Protective effects of marriage quality on health have also been found in China, Japan, Taiwan, and South Korea (Chung & Kim, 2014). Generally, these effects are more pronounced in men than in women and extend to mortality (Robards et al., 2012; Rendall et al., 2011).

But why would marriage (a social relationship) affect health (a biological state)? One approach posits that marriage is associated with the encouragement of health-promoting behaviors (Jackson et al., 2015). So, for example, a husband might persuade or encourage his wife to stop smoking. Although there is some support for this idea, the story is more nuanced. Marriage seems to decrease the levels of hedonic risks such as going out to bars, drinking heavily, smoking, or dangerous driving. However, marriage increases homebody risks such as a sedentary lifestyle, a high fat diet, and being overweight (Ross et al., 2016). Moreover, just as spouses can encourage healthy behaviors in each other, they can also encourage unhealthy behaviors in each other. For example, when one member of a couple becomes obese, the risk of the other spouse becoming obese as well nearly doubles (Cobb et al., 2015). When attempting to quit smoking, married people are more successful if their spouse attempts to quit at the same time or is a nonsmoker (Franks et al., 2002; Foulstone et al., 2017).

A second theory focuses on the stress response system. In this view, the social support provided by marriage buffers individuals against life stressors. As chronic stress negatively affects health, a strong marriage can provide some protection against this process (Robles et al., 2014). However, although a good marital relationship can buffer people against life stressors, a poor marital relationship can make people more vulnerable to them. Marital strains increase both men's and women's aging-related declines in health, and this effect grows stronger with age (Umberson et al., 2006). Similarly, women who are in unsatisfying married or cohabiting relationships are at higher risk for cardiovascular disease and other health problems, especially if marital conflict is involved (Gallo et al., 2003; Kiecolt-Glaser & Glaser, 2001). Some of this may be mediated by immune function. Long-term stress depresses immune system functioning (Dhabhar, 2014). Being in a good marriage, with its protective social support, can thus bolster the immune system (Graham et al., 2006).

Over time, the influence each spouse has on the other increases in strength, in part because spouses' lives become increasingly intertwined, and each partner's emotional states, behaviors, and stressors interactively affect each other. Thus, their health and health

behaviors—for good or bad—tend to converge over time (Kiecolt-Glaser & Wilson, 2017). In all cases, marital quality is key. Whereas a good marital relationship can buffer people against life stressors, a poor marital relationship can make people more vulnerable to them.

## COHABITATION

Rates of cohabitation have increased globally in recent decades. Across 36 countries in the Americas, Asia, and Europe, the average cohabitation rate is approximately 10 percent (Organisation for Economic Co-operation and Development, 2016). The rate of cohabitation in African countries varies widely. For example, rates are high in countries such as the Central African Republic (80 percent), Mozambique (74 percent), and Gabon (61 percent) but almost nonexistent in Muslim countries such as Niger (0.1 percent) and Senegal (0.3 percent) (Odimegwu et al., 2018). Nonmarital relationships, or *zina*, are forbidden under Islamic law (Pereira, 2005); therefore, cohabitation is rare in such countries.

Cohabitation has increased greatly in the United States and is now more common than marriage. About 18 million adults—8 percent of adults age 35 to 49 and 4 percent of adults 50 and older—were cohabitating in 2016 (Stepler, 2017), and 71 percent of adults age 31 to 44 years have cohabitated at some point in their life (Horowitz et al., 2019). Baby boomers have shown the largest percent increase in cohabitation rates of any age group (Manning, 2013). When older adults do cohabit, their relationships are generally more stable than those of younger cohabiting adults, and cohabitation is more often viewed as an alternative to marriage rather than a prelude to it (Brown et al., 2012).

What explains the rise in cohabitation for older adults? One of the reasons is a desire for an intimate companion without the commitment of formal marriage—a commitment that, in middle age, may come to mean having to care for an infirm partner. Whereas the majority of younger cohabitators have not been previously married, the majority of older cohabitators have (Stepler, 2017). Moreover, cohabiting adults with disabled or ill partners, as a whole, provide less care than do married partners in the same situation (Noël-Miller, 2011). This process appears to be most relevant for widowed women (Davidson, 2001). Aging men, alternatively, may be motivated to cohabit because they anticipate needing the kind of care that wives traditionally provide and may worry about not getting it otherwise (Brown et al., 2005).

On average, cohabitating couples report worse mental health than do married couples. The disparity between married and cohabiting couples is largest in religious, collectivistic countries with traditional gender roles and in which cohabitation is rare (Amato, 2014). However, the outcomes of cohabitation differ by country. For example, though cohabitation does not provide the same level of health benefits as marriage in the United States, Britain, and Australia, cohabiting adults and married adults are equally healthy in Norway and Germany. In Australia, cohabiting women, but not men, are as healthy as married people (Perelli-Harris et al., 2017).

However, particularly later in life, cohabitation does offer benefits and often serves as a substitute for marriage. For instance, cohabitating unions tend to be long-lasting at midlife, averaging almost a decade in length (Brown et al., 2012). And, although cohabitators report slightly lower relationship quality and commitment than married couples, they nonetheless are happier than single older adults and report similar levels of relationship support, disagreement, and instability as married couples (Brown & Manning, 2021).

## DIVORCE

One of the major societal shifts of the twentieth century was the global increase in the divorce rate. Much of this increase can be attributed to economic development and industrialization, and especially to increases in women's educational and occupational status. Religion is also important, and both Catholicism and Islam are negatively associated with divorce. Last, cultural values such as freedom, consent, and gender equality are associated with divorce (Wang & Schofer, 2018).

American couples who blamed the stress they were feeling during COVID-19 lockdowns on the pandemic rather than their partner had higher relationship satisfaction than those couples who blamed each other or themselves for their stress (Neff et al., 2021).



#### marital capital

Financial and emotional benefits built up during a long-standing marriage, which tend to hold a couple together.

All else being equal, couples with daughters are more likely to divorce than those with sons (Dahl & Moretti, 2004).



Divorce rates vary widely across countries. The Maldives (5.52 divorces per 1,000 people) and Kazakhstan (4.6 divorces per 1,000 people) top the list. Sri Lanka (0.15 divorces per 1,000) and Vietnam and Guatemala (0.4 divorces per 1,000) lie at the bottom. In the United States, the divorce rate is 2.7 divorces per 1,000 people. As a result of the COVID-19 pandemic, divorce rates dropped by 0.2 to 0.4 points in almost every country in the world (World Population Review, 2021).

Divorce rates for younger adults have fallen in recent years; however, divorce rates for middle-aged adults are rising. From 1990 to 2015, the divorce rate for adults age 40 to 49 rose by 14 percent, and the divorce rate for adults older than 50 rose by a stunning 109 percent (Stepler, 2017). Although divorce in midlife is more common than in the past, the breakup can still be traumatic. In a survey of adults who had been divorced at least once in their forties, fifties, or sixties, most respondents described the experience as more emotionally devastating than losing a job and about as devastating as a major illness, though less devastating than a spouse's death. Midlife divorce seems especially hard for women, who are more negatively affected psychologically by divorce at any age than men are (Marks & Lambert, 1998; Montenegro, 2004).

With respect to physical health, marital dissolution is associated with apparently contradictory health outcomes (Sbarra et al., 2015). First, divorce is associated with an elevated chance of chronic health conditions and mortality in both sexes, but especially in men (Sbarra & Coan, 2017; Hughes & Waite, 2009; Amato, 2010). Second, most people adjust well to divorce and ultimately do well (Amato, 2010; Mancini et al., 2011; Luhmann et al., 2012). How do we explain these diverse threads of research?

It may be that individual differences in the response to divorce explain the discrepancy in findings. For instance, a relatively small proportion of adults may show an extreme response to divorce and exhibit health-related consequences such as blood pressure increases or cardiovascular disease. Other adults may be more resilient and adjust well, explaining other findings. Thus, to understand the effects of divorce, we must examine individual risk and resilience factors (Sbarra et al., 2015).

Long-standing marriages may be less likely to break up than more recent ones. One possible explanation lies with the concept of **marital capital**. The longer a couple is married, the more likely they are to have built up joint financial assets, to share the same friends, to go through important experiences together, and to get used to the emotional benefits that marriage can provide. This accumulated "capital" can be difficult to give up (Becker, 1991; Jones et al., 1995).

Another important factor that keeps many couples from divorcing is finances. Higher socioeconomic status is associated with lower risk of divorce in the United States, Israel, Finland, Denmark, Germany, Sweden and other countries (Kaplan & Herbst, 2015; Jalovaara, 2003; Esping-Anderson, 2016). Moreover, the likelihood of divorce is negatively associated with home ownership and higher financial assets (Coulter & Thomas, 2019). Additionally, stable marriages are also more likely to have low debt and be high in financial satisfaction (Dew, 2011; Archuleta et al., 2011). Financial disagreements also predict divorce (Dew et al., 2012).

One interpretation of these findings is that healthy marriages are more likely to have healthy finances and thus presumably more to lose on both fronts in the event of divorce. However, gender interacts with income. When women outearn their husbands, the risk of divorce increases (Kaplan & Herbst, 2015; Jalovaara, 2003, 2001). Most of the time, however, when marriages end, middle-aged divorced people, especially women who do not remarry, tend to be less financially secure than those who remain married (Wilmoth & Koso, 2002; Lin et al., 2017).

The number one reason given for divorce is partner abuse—verbal, physical, or emotional. Other frequent reasons are differing values or lifestyles, infidelity, alcohol or drug abuse, relationship problems, and simply falling out of love (Marks & Lambert, 1998; Cohen & Finzi-Dottan, 2012).

Divorce is not just a feature of the modern world. It is also common in hunter-gatherer cultures (Bird-David, 1987). For example, among the Chabu of Ethiopia, almost half of adults have been divorced, and 22 percent have divorced more than once (Dira

## checkpoint can you ...

- Describe the typical age-related pattern of marital satisfaction, and cite factors that may help explain it?
- Discuss issues regarding gay and lesbian relationships at midlife?
- Compare the benefits of marriage and cohabitation in middle age?
- Discuss the effects of marriage, cohabitation, and divorce on well-being and physical and mental health?

& Hewlett, 2018). In the nomadic Hadza of Tanzania, approximately 80 percent of marriages end, and divorce is common (Marlowe, 2004). Common reasons given for divorce in hunter-gatherer cultures include infertility, infidelity, and laziness (Marlowe, 2004; Dira & Hewlett, 2018). The availability of other fertile women in the group is also predictive of marriage instability (Jones et al., 2017).

## FRIENDSHIPS

Social relationships are vitally important; both their quantity and quality are predictive of mental health, physical health, and mortality (Dunbar, 2020; Holt-Lunstad et al., 2010). As socioemotional selectivity theory predicts, social networks tend to become smaller and more intimate at midlife. Still, friendships persist and are a strong source of emotional support and well-being, especially for women (Carmichael et al., 2015; Antonucci et al., 2001). However, their importance varies with cultural context. In individualistic cultures, not having friends or a lack of interaction with friends is associated with loneliness. In collectivistic cultures, it is not, as family members are more likely to fill relationship needs (Lykes & Kemmelmeier, 2014).

The quality of midlife friendships often makes up for what they lack in quantity of time spent. Especially during a crisis, such as a divorce or a problem with an aging parent, adults turn to friends for emotional support, practical guidance, comfort, companionship, and talk (Bruggencate et al., 2018; Hartup & Stevens, 1999). The quality of such friendships can affect health, as can lack of friendships. Loneliness, for example, is predictive of increases in blood pressure, even when such variables as age, gender, race, and cardiovascular risk factors are taken into account (Hawkley et al., 2010).

While in early adulthood, loneliness, depression, well-being, and social integration are affected by the number of friends a person has, in late adulthood, the quality of friends is what matters. While more older adults lack a confidant and often feel lonely as a result, when they do have good friends, they report more satisfaction as a result of contact with their friends than do younger adults (Nicolaisen & Thorsen, 2017). Those older adults with higher-quality friendships have better psychosocial well-being (Carmichael et al., 2015). This is especially true in times of crisis: Depressed adults with high-quality friendships have a lower suicide risk than those who do not have good friends (Marver et al., 2017).



*Loneliness is contagious. Recent research conducted on social networks suggests lonely people act in less affirming ways to others. Their behavior is often interpreted as implying rejection or indifference, which then makes those people feel more lonely too (Hawkley & Cacioppo, 2010).*

### checkpoint can you...

- Summarize the quantity, quality, and importance of friends in middle age?

# Relationships with Maturing Children

Some middle-age people face such issues as finding a good day care or helping their grade-school child with homework. However, most parents in middle age must cope with a different set of issues that arise from living with children who will soon be leaving home. Moreover, middle-age parents increasingly have to deal with an adult child continuing to live in the family home or leaving it only to return.

## ADOLESCENT CHILDREN

Ironically, the people at the two times of life popularly linked with emotional crises—adolescence and midlife—often live in the same household. In addition to dealing with their own special concerns, parents have to cope daily with young people who are undergoing great physical, emotional, and social changes.

Although many parents report a mix of emotional warmth and antagonism in their relationships with their children (Silverstein & Giarrusso, 2010), most parents at midlife express they are happy with their parenting role. For example, mutual warmth and acceptance has been associated with parenting satisfaction in both Chinese and Euro-

pean American middle-aged mothers (Chang & Greenberger, 2012). Moreover, being involved with and committed to the parenting relationship, feeling confident in parenting abilities, and successfully managing parenting role conflict are positively related to well-being in Israeli parents (Cohen & Bocos, 2016) and associated with positive family adjustment and solidarity in Italian parents (Delvecchio et al., 2016). However, contextual and relational variables affect happiness. For example, parents are more likely to report happiness when they are financially secure, healthy, close to their child, retired, or younger (Mitchell, 2010). Parenting satisfaction is also positively related to parental education level and marital status and negatively related to conflict between the parents (Downing-Matibag, 2009).

Parental satisfaction declines when parents perceive their adolescent children as being involved in negative behaviors or failing to meet the challenges of life (Downing-Matibag, 2009). And when parents do not approve of their child's choices, they are more likely to perceive their child's striving for autonomy as hostile or immature (Kloep & Hendry, 2010). However, a healthy attachment between parent and teen can, somewhat paradoxically, make the separation process of adolescence and early adulthood proceed more smoothly (Ponappa et al., 2014; Inguglia et al., 2015).

Some parents, known as helicopter parents, have more difficulty granting autonomy. These parents are overinvolved in their child's lives, especially with respect to schooling issues, and intrusively interfere with the development of their child's autonomy. This well-intentioned but misguided parenting is associated with low autonomy granting, school disengagement, depression, anxiety, low life satisfaction, low self-efficacy, and poor adjustment to college (Padilla-Walker et al., 2012; Schiffriin et al., 2014; Darlow et al., 2017).

## THE EMPTY NEST

Feeling lonely? Try heating your house. Research suggests that how warm the temperature of a room is affects how socially connected we feel. Warmer rooms are associated with feelings of closeness to others (Ijzerman & Semin, 2009).



### empty nest

Transitional phase of parenting following the last child's leaving the parents' home.

Research is challenging popular ideas about the **empty nest** that occurs when the youngest child leaves home. Although some parents can have problems in adjusting to the empty nest, they are far outnumbered by those who find the departure liberating. Generally, parents whose children have left the nest report higher levels of well-being, especially when their children stay in frequent contact with them (Bouchard, 2014; Gorchoff et al., 2008; White & Edwards, 1990). They are particularly likely to adjust well when their children leave "on time," are perceived to be successful, moral people, and have good family bonds (Mitchell, 2010). Whether or not families are blended also matters. Stepmothers and fathers whose children with previous partners move out report greater increases in life satisfaction at the launching of children from the family home than other groups (Ivanova, 2019).

When children are not accomplished, however, this process may be more difficult. Typically, when adult children have greater needs, parents provide more material and financial support to them (Fingerman et al., 2009), a process which can provide parents relief from negative moods (Huo et al., 2017). Given this tendency, it is not surprising to also find that such parents are likely to feel torn between wanting their adult children to assert their independence and a desire to step in and help. Men, in particular, seem to be more affected by their children's successes and failures (Birdtitt et al., 2010). Some ambivalence during these situations is standard, but far more stress results when there is already tension in the relationship (Birdtitt et al., 2009) or when grown children return home (Thomas, 1997). This stress has been shown to raise parents' stress hormone levels (Birdtitt et al., 2016), a finding that has negative implications for their health.

The departure of children from the family home generally increases marital satisfaction, perhaps because of the additional time partners now have to spend with each other (Bouchard, 2014; Gorchoff et al., 2008). The empty nest may be harder on couples whose identity is dependent on the parental role or who now must face marital problems they had previously pushed aside under the press of parental responsibilities (Antonucci et al., 2001).

Race, ethnicity, and cultural context can affect the dynamics of leaving the nest. For example, White parents generally provide more financial support to their adult children than do African American parents. Part of this is driven by available resources as White

parents are more likely to be of higher socioeconomic status. However, child status (specifically, being a student) and cultural beliefs about helping are also an influence (Fingerman et al., 2011).

In much of the world, including many parts of Europe, Asia, and Latin America, the normative expectation regarding the living status of adult children is that they will remain in their parents' home until marriage (Buhl & Lance, 2007; Rosenberger, 2007; Fierro & Moreno, 2007). Because of the different expectations for adult children, the responses to their exit also vary. For example, multiple studies with Chinese samples have demonstrated Chinese parents whose adult children move out are more likely to show declines in well-being and physical health and increases in loneliness and depression than are those whose children remain in the family home (He et al., 2020; Bouchard, 2014; Zhang et al., 2020). Within cultures such as these, leaving the family home before marriage can be perceived not as a healthy step toward adult independence but as a sign of the breakdown in family bonds (Goldscheider & Goldscheider, 1999).

However, the empty nest does not signal the end of parenthood. It is a transition to a new stage: the relationship between parents and adult children.

## ADULT CHILDREN

Middle-aged parents generally give their children more help and support than they get from them (Antonucci et al., 2001). Approximately 60 percent of parents with children give financial assistance to their 18- to 29-year-old children at least once a year (Barroso et al., 2019). Parents give the most help to children who need it most, typically those who are single or are single parents, or who are criminal offenders (Blieszner & Roberto, 2006; Siennick, 2011). This assistance improves their chances of attending college, establishing careers, or buying homes (Johnson & Benson, 2012).

From the adult child's point of view, the provision of financial support from a parent can threaten self-efficacy (Mortimer et al., 2016). Although living with parents can provide much needed financial and emotional support, it can also threaten a sense of independence (Burn & Szoek, 2016). Moreover, the provision of assistance may be perceived by both parents and children as lending some legitimacy to parental efforts to control children (Padilla-Walker et al., 2014), undermining child autonomy. For example, college students forced to return home during COVID-19 pandemic lockdowns reported feeling less adultlike and, particularly in lower income families, had more conflictual relationships with their parents (Hall & Zygmunt, 2021).

Since the 1980s in most Western nations, more and more adult children have delayed leaving home until the late twenties or beyond (Mouw, 2005). Furthermore, the **revolving door syndrome**, sometimes called the boomerang phenomenon, has become more common. Increasing numbers of young adults, especially men, return to their parents' home, sometimes more than once and sometimes with their own families (Aquilino, 1996; Blieszner & Roberto, 2006; Putney & Bengtson, 2001). Often a return to the family home is precipitated by emotional or financial concerns, or alcohol problems (Sandberg-Thoma et al., 2015; Smits et al., 2010). Sometimes adult children move back home to care for ailing parents (South & Lei, 2015).

These transitions can be challenging to navigate. Parents of adult children returning home generally report a negative impact on their quality of life (Tosi & Grundy, 2018). However, in many cases, parents adjust and return to their previous levels of mental health within the following year (Tosi, 2020). Overall, most parents find living with their adult children to be a low-conflict, largely positive experience (Casares & White, 2018). This is particularly true when parent-child coresidence is normative (Davis et al., 2016), such as when economic downturns drive children back to the family home.

## VOLUNTARY CHILDLESSNESS

The number of women without children has been rising sharply in recent decades (Frejka, 2017). Almost 27 percent of women age 30 to 39 and slightly over 15 percent of



Parents are more likely to show favoritism for adult children than young children, in particular when those children are daughters, live nearby, share their values, have avoided deviant behaviors, and have previously helped them out (Siu et al., 2008).

### revolving door syndrome

Tendency for young adults who have left home to return to their parents' household in times of financial, marital, or other trouble.



Do you think it is a good idea for adult children to live with their parents?

## checkpoint can you ...

- ▶ Discuss the changes parents of adolescent children go through?
- ▶ Compare how women and men respond to the empty nest?
- ▶ Describe typical features of relationships between parents and grown children?
- ▶ Give reasons for the prolonged parenting phenomenon, and discuss its effects?

women age 40 to 50 have never given birth to a child (US Census Bureau, 2019). Similar trends have been found in other countries as well, including Austria, Germany, the Netherlands, Switzerland, and the United Kingdom, and to a lesser extent in Central and Eastern Europe (Kreyenfeld & Konietzka, 2017).

Although involuntary childlessness—or infertility—has a negative effect on well-being (Luk & Loke, 2015), voluntary childlessness does not. Generally, people who are childless by choice have higher well-being and better psychological health than parents, especially those who had children when young, and empty nesters (Koropeckyj-Cox et al., 2007; Hansen, 2012; Umberson et al., 2010; Bures et al., 2009). This same pattern is found across a number of countries, although it is less pronounced in countries that have stronger norms regarding parenthood (Huijt et al., 2013).

In later adulthood, research has shown that childless women tend to fare well, but childless men are more vulnerable. For example, in one study, never-married, divorced, or widowed men were at higher risk for depression than their female counterparts (Zhang & Hayward, 2001). Similarly, research conducted in Austria, Finland, and the Netherlands showed that divorced childless men were at risk for poor health, whereas divorced childless women were not (Kendig et al., 2007). One possible explanation focuses on social connections. Childless older women tend to be very active socially and have particularly robust social networks and community connections. Married childless men often depend on their wives to link them to this support network. Thus, when both unmarried and childless, these men are more prone to difficulties (Wenger et al., 2007).

## Other Kinship Ties

At midlife, responsibility for care and support of aging parents may begin to shift to their middle-aged children. In addition, a new relationship often begins at this time of life: grandparenthood.

### AGING PARENTS

Even when they do not live close to each other, most middle-age adults and their parents have warm, affectionate relationships based on frequent contact, mutual help, feelings of attachment, and shared values. Positive relationships with parents contribute to a strong sense of self and to emotional well-being at midlife (Blieszner & Roberto, 2006).

Most commonly, help and assistance continue to flow from adults to their own children rather than to their parents (Pew Research Center, 2015). However, with the changing demographics of the United States, particularly the lengthening of the life span, many middle-aged adults gradually take on more responsibilities for their parents. For example, a son might realize that his mother is no longer able to drive and might decide to stop by the grocery store once a week for her. This normative development is seen as the healthy outcome of a **filial crisis**, in which adults learn to balance love and duty to their parents with autonomy in a two-way relationship.

Almost 1 in 5 adults—approximately 42 million people—acts as a caregiver for an aging parent. This is an increase of 16.6 percent since 2015 (National Alliance for Caregiving & AARP, 2020). The majority of help consists of assistance with everyday needs and, less commonly, emergencies and crises. Overall, emotional care and financial assistance are more commonly provided from parents to adult children, while practical help is more often directed toward aged parents (Hämäläinen & Tanskanen, 2021). This pattern is true of most families; however, the dynamics may change in situations in which parents are disabled or experience some sort of crisis themselves. Not surprisingly, in these cases, adult children often provide resources to their middle-aged parents (Fingerman et al., 2010).

#### filial crisis

In Marcoen's terminology, normative development of middle age in which adults learn to balance love and duty to their parents with autonomy within a two-way relationship.



Most middle-aged adults and their aging parents have warm, affectionate relationships.

Hero/Fancy/Corbis/Glow Images



## THE GLOBAL SANDWICH GENERATION

Researchers have called those in their forties and fifties who are squeezed between caring for both their own children and their aging parents the “sandwich generation.” According to the Pew Research Center, 47 percent of middle-age adults are part of the sandwich generation in the United States. About 15 percent of US middle-age adults are providing financial support in some way to both a parent and a child. In addition, 61 percent of these adults are also providing emotional support and day-to-day assistance to both their aging parents and their own children (Parker & Patten, 2013). About 29 percent of adult children up to age 30 still live with their parents or have returned home after college, being at least partially supported by their parents (Parker, 2012).

Similar trends have been found in other parts of the world as well. Although much of this research has focused on Europe and North America, there is also evidence that sandwiching is common in the global South, and indeed adult children there often spend a longer time period being sandwiched than do adults in the global North (Alburez-Gutierrez et al., 2021).

Regions with both high mortality and higher fertility tend to have more sandwiched adults. This is because high mortality makes it more likely a grandparent will

be around to assist aging parents and because high fertility increases the probability of generational overlap. Because of global declines in both fertility and mortality, some researchers predict a decline in sandwiching in coming years (Alburez-Gutierrez et al., 2021).

A study by the American Psychological Association found that 40 percent of adults in the 35 to 55 age range who are caregivers for both parents and children reported extreme levels of stress, stating that family was the top source of their stress. This stress takes a toll on family relationships and the well-being of the caretakers themselves (American Psychological Association, 2007). It is important for caretakers to recharge and take care of themselves physically and mentally. Though it may feel like a challenge at times, those being cared for are usually the people that are most important to the caretakers, and their care is an act of dedicated love for their family members.



How would you handle the responsibilities of caring for aging parents? What can you do to support a loved one who finds themselves in this situation?

Members of this generation—sometimes called the **sandwich generation**—may be caught in a squeeze between the competing needs of their own children and the emerging needs of their parents (see Windows on the World).

Caregiving is typically a female function, especially in older populations (Fingerman et al., 2020). When an ailing mother is widowed or a divorced woman can no longer manage alone, it is most likely that a daughter will take on the caregiving role (Pinquart & Sörenson, 2006). Daughters and older mothers tend to be especially close (Fingerman & Dolbin-MacNab, 2006). Daughters tend to provide more care to aging parents, but the proportion of sons and daughters in a family affect this process. If a woman has brothers, she tends to provide more care. If a man has sisters, he tends to provide less care (Grigoryeva, 2017).

### **sandwich generation**

Middle-aged adults squeezed by competing needs to raise or launch children and to care for elderly parents.

**Ethnic and Cultural Differences in Caregiving** Expectations and beliefs about care provided to parents differ by race and ethnicity. For example, Black and Hispanic adults are more likely than White adults to provide assistance to aging parents (Cohen et al., 2019; Ellison & Xu, 2016). Similarly, Asian, Hispanic, and foreign-born Americans are more likely to live in multigenerational households, which can include aging parents, than are white Americans (Cohn & Passel, 2018). These findings may result, in part, because of socioeconomic differences between people of different ethnicities. In particular, Black and Hispanic adults are more likely to have limited resources and so less frequently use formal caregiving services for their parents (Dilworth-Anderson et al., 2002). Moreover, race intersects with gender. For example, women are likely to provide more care to aging

parents, as are African American adults. Thus, the group that provides the greatest amount of care is Black women (Cohen et al., 2019).

Religion also affects the tendency to offer help. Protestants, Mormons, and Catholics, particularly those who are more conservative, are more likely to endorse having aging parents live with them than are Jewish, mainline Protestants, or religiously unaffiliated adults (Ellison & Xu, 2016). These religions share a concern for conventional family values and respect for elders.

Family caregiving beliefs also vary across cultures. As with many cultural differences, the collectivism/individualism dimension is important. Adults from collectivistic cultures that stress interconnections and the greater social good, not surprisingly, tend to be more supportive of parental caregiving. Adults from individualistic cultures, with their emphasis on autonomy, are more likely to view caring for their parents as a barrier to their personal goals (Mitchell, 2014).

Familism is another important cultural variable. Familism places family well-being over individual concerns, and people from cultures high in familism are more likely to care for aging parents themselves rather than using a formal system. Filial responsibility is related to this and involves feeling duty-bound to support aging parents. Not fulfilling filial obligations can often be seen as shameful. Hispanic families and many Asian cultures share a strong sense of these obligations. For example, one study found more caregiving of aging parents was provided by Asian and Hispanic adults, and less by non-Hispanic White adults (Miyawaki, 2016).

**Strains of Caregiving** Although 51 percent of caregivers report their role gives them a sense of purpose and meaning (National Alliance for Caregiving & AARP, 2020), caring for aging parents can also be stressful and time-consuming. Many caregivers find the task a physical, emotional, and financial burden, especially if they work full-time, have limited financial resources, or lack support and assistance (Lund, 1993; Schulz & Martire, 2004). It is hard for women who work outside the home to assume an added caregiving role, and reducing work hours or quitting a job to meet caregiving obligations can increase financial stress.

Caregiving can also lead to marriage problems. Adult caregivers report less marital happiness, greater marital inequality, more hostility, and, for women, a greater degree of depressive symptomatology and depression over time (Bookwala, 2009). Some research has shown that caregiving is associated with a greater risk of relationship dissolution for women in cohabitating relationships but not necessarily for men or for married women (Penning & Wu, 2019). Moreover, a middle-age child, who may be preparing to retire, can ill afford the additional costs of caring for a frail older person or may have emerging health problems of their own (Kinsella & Velkoff, 2001).

Estimates are that approximately 63 percent of family caregivers are caring for a parent with physical impairments (National Alliance for Caregiving & AARP, 2020). Caring for a person with physical impairments is hard. Increasing disability on the part of aging parents is associated with declines in relationship quality between parents and children (Kim et al., 2016). It can be even more difficult to care for someone with memory problems, a situation faced by 32 percent of caregivers. Moreover, 45 percent of care recipients have more than one condition or illness (National Alliance for Caregiving & AARP, 2020).

Dementia and related conditions are among the hardest to cope with. In addition to being unable to carry on basic functions of daily living, people with dementia may be incontinent, suspicious, agitated or depressed, subject to hallucinations, likely to wander about at night, dangerous to self and others, and in need of constant supervision. Sometimes the caregiver becomes physically or mentally ill under the strain (Richardson et al., 2013). Because women are more likely than men to give personal care, their mental health and well-being may be more likely to suffer (Friedemann & Buckwalter, 2014; Pinquart & Sörenson, 2006). Sometimes the stress created by the incessant, heavy demands of caregiving is so great as to lead to abuse, neglect, or even abandonment of the dependent elderly person (Lachs & Pillemer, 2015).

A result of these and other strains may be **caregiver burnout**, a physical, mental, and emotional exhaustion that can affect adults who care for aged relatives (Hategan et al.,

#### caregiver burnout

Condition of physical, mental, and emotional exhaustion affecting adults who provide continuous care for sick or aged persons.

2018). Even the most patient, loving caregiver may become frustrated, anxious, or resentful under the constant strain of meeting an older person's seemingly endless needs. Often families and friends fail to recognize that caregivers have a right to feel discouraged, frustrated, and put upon. Caregivers need a life of their own, beyond the loved one's disability or disease. Sometimes other arrangements, such as institutionalization, assisted living, or a division of responsibilities among siblings, must be made (Shuey & Hardy, 2003).

Community support programs can reduce the strains and burdens of caregiving. Support services may include meals and housekeeping; transportation and escort services; and adult day care centers, which provide supervised activities and care while caregivers work or attend to personal needs. Respite care (substitute supervised care by visiting nurses or home health aides) gives regular caregivers some time off. Through counseling, support, and self-help groups, caregivers can share problems, gain information about community resources, and improve skills.

Some family caregivers, looking back, regard the experience as uniquely rewarding. If a caregiver deeply loves an infirm parent; cares about family continuity; looks at caregiving as a challenge; and has adequate personal, family, and community resources to meet that challenge, caregiving can be an opportunity for personal growth in competence, compassion, self-knowledge, and self-transcendence. Moreover, family caregivers report a sense of spiritual and religious growth and fulfilling a sense of duty (Lloyd et al., 2016; Climo & Stewart, 2003). When family caregivers can identify and articulate the positive aspects of caring for a person with dementia, they are less likely to experience depression and more likely to report higher well-being, life satisfaction, and self-efficacy (Quinn & Toms, 2018).



What would you do if one or both of your parents required long-term care? To what extent should children or other relatives be responsible for such care? To what extent, and in what ways, should society help?

## SIBLINGS

Sibling ties are the longest-lasting relationships in most people's lives. In some cross-sectional research, sibling relationships over the life span look like an hourglass, with the most contact at the two ends—childhood and middle to late adulthood—and the least contact during the child-raising years. After establishing careers and families, siblings may renew their ties (Putney & Bengtson, 2001; Conger & Little, 2010). Other studies indicate a decline in contact throughout adulthood. Sibling conflict tends to diminish with age—perhaps because siblings who do not get along see each other less (Putney & Bengtson, 2001).

Overall, relationships between siblings at midlife tend to be positive in nature, with lower sibling conflict than that found earlier in life. Most siblings remain in contact and communicate in some fashion between one to several times a week (Stocker et al., 2020). As older adults have become more adept at the use of media and technology, much of their contact has become electronic in nature, with more communication generally associated with higher life satisfaction (Jensen et al., 2019). As in young adulthood, sisters tend to be closer than brothers (Stocker et al., 2020). Sibling relationships may be particularly beneficial for those adults who did not have children. For instance, siblings sometimes serve as caregivers for each other, and when they do, they are less negatively affected by doing so than are caregivers for parents or spouses (Namkung et al., 2016).

Dealing with the care of aging parents can bring siblings closer together but also can cause resentment and conflict. Disagreements may arise over the division of care or over an inheritance, especially if the sibling relationship has not been good (Ngangana et al., 2016; Blieszner & Roberto, 2006). Problems may also emerge if there are perceptions of favoritism, either as perceived currently or as remembered from childhood, particularly for the maternal relationship (Peng et al., 2016; Suior et al., 2015).

## checkpoint can you . . .

- Describe the change in the balance of filial relationships that often occurs between middle-aged children and elderly parents?
- Cite sources of potential strain in caregiving for elderly parents?
- Discuss the nature of sibling relationships in middle age?

## GRANDPARENTHOOD

Adults in the United States become grandparents, on average, about age 50 (Nelson-Kakulla, 2019). In 2018, the United States had a population of almost 70 million grandparents (Monte, 2017). Fifty-one percent of people age 50 to 64 have grandchildren, and about a third of them list grandparenting as the most valued aspect of getting older (Livingston & Parker, 2010).



*In many Asian countries, grandparents live in the same home as their grandchildren, playing an important role in their lives.*

Kohei Hara/Digital Vision/Getty Images

Grandparenthood today is different in other ways from grandparenthood in the past.

Most US grandparents have fewer grandchildren than their parents or grandparents did (Blieszner & Roberto, 2006). With the rising incidence of midlife divorce, many grandparents are divorced, widowed, or separated (Davies & Williams, 2002), and many are stepgrandparents. Middle-age grandparents tend to be married, active in their communities, and employed and thus less available to help out with their grandchildren. They also are more likely to be raising one or more children of their own (Blieszner & Roberto, 2006).

In general, grandmothers have closer, warmer, more affectionate relationships with their grandchildren (especially granddaughters) than grandfathers do and see them more (Putney & Bengtson, 2001). Grandparents who have frequent contact with their grandchildren, feel good about grandparenthood, attribute importance to the role, and have high self-esteem tend to be more satisfied with being grandparents (Reitzes & Mutran, 2004). Grandparents sometimes have difficulty balancing their connection with their grandchildren and allowing their children to parent their family in accordance with their own beliefs and values (Breheny et al., 2013).

**Cultural and Ethnic Differences in Grandparenting** In many low- and middle-income countries such as those in Latin America and Asia, extended-family households are common, and grandparents play an integral role in child raising and family decisions. Their assistance is often precipitated by factors such as poverty, disease, migration, and other family challenges and crises. In Asian countries such as Thailand and Taiwan, about 40 percent of the population age 50 and older live in the same household with a minor grandchild, and half of those with grandchildren age 10 or younger—usually grandmothers—provide care for the child (Kinsella & Velkoff, 2001). In China and Romania, mothers' migration in search of work resulted in large numbers of young children being "left behind" with family members, usually grandmothers (Ban et al., 2017; Piperno, 2012). In some countries in sub-Saharan Africa, high mortality rates in young adults as a consequence of AIDS make grandparents a critical resource for the children left orphaned by disease (Uhlenberg & Cheuk, 2010). Grandparent care is also common in Europe, with slightly over 40 percent of grandparents providing regular or occasional care for their grandchildren. The provision of regular day care is somewhat more common in Southern than Northern Europe (Glaser et al., 2013; Iacovou & Skew, 2011). In short, grandparents—globally—are an important part of their grandchildren's lives.

In the United States, the extended family household is common in some minority communities, but the dominant household pattern is the nuclear family. In 2018, estimates are that approximately 10 percent of US grandparents lived in households with their grandchildren (Nelson-Kakulla, 2019). Although 68 percent of the grandparents in an AARP survey see at least one grandchild every 1 or 2 weeks, 45 percent live too far away to see their grandchildren regularly (Davies & Williams, 2002). Indeed, geographical distance is the greatest barrier to seeing grandchildren (Nelson-Kakulla, 2019).

About 22 percent of US grandparents provide regular child care for working parents (Krogstad, 2015). Indeed, grandparents are almost as likely to be child care providers as organized child care centers or preschools; 23.7 percent of children under age 5 and 31.7 percent of children overall with employed mothers are under a grandparent's care while the mothers are at work (Laughlin, 2013). In countries where the government spends more funds on child care assistance, grandparent care is less common. For example, in Denmark and Sweden, approximately 2 percent of families use grandparent care, contrasted with 15 percent in Germany and around 30 percent in Italy and Spain (Del Boca, 2015). Geographical proximity of grandparents who are willing to assist with child care, including both regular care and unanticipated "emergency" care, has a positive effect on the probability of women working outside the home (Compton & Pollak, 2014).

In what will likely shock no one,  
66 percent of grandparents  
think parenting in their  
youth was better than  
parenting now, and 77  
percent of them think  
parents are too lax with  
their children (Nelson-  
Kakulla, 2019).



**Grandparenting after Divorce and Remarriage** One result of the rise in divorce and remarriage is a growing number of grandparents and grandchildren whose relationships are endangered or severed. After a divorce, because the mother usually has custody, her parents tend to have more contact and stronger relationships with their grandchildren, and the paternal grandparents tend to have less (Doyle et al., 2010). When fathers have primary custody or share custody, paternal grandparents continue to have contact with their grandchildren, and the degree of contact may even increase if the divorced father needs assistance (Jappens & Van Bavel, 2016).

A divorced mother's remarriage typically reduces her need for support from her parents but not their contact with their grandchildren. For paternal grandparents, however, the new marriage increases the likelihood that they will be displaced or that the family will move away, making contact more difficult (Cherlin & Furstenberg, 1986). This is unfortunate; continued contact and a good relationship with grandparents is associated with greater life satisfaction, higher self-esteem and mastery, and lower anxiety in children whose parents have divorced (Jappens, 2018).

**Raising Grandchildren** Many grandparents are their grandchildren's sole or primary caregivers. One reason, in developing countries, is the migration of rural parents to urban areas to find work. These skip-generation families exist in all regions of the world, particularly in Afro-Caribbean countries. In sub-Saharan Africa, the AIDS epidemic has left many orphans whose grandparents step into the parents' place (Kinsella & Velkoff, 2001).

In the United States, almost 4 percent of grandparents are raising a grandchild (US Census Bureau, 2016). Many are serving as parents by default for children whose parents are unable to care for them—often as a result of teenage pregnancy, substance abuse, illness, divorce, or death (Glaser et al., 2018). Increasingly, the opioid epidemic is taking a toll as well, and growing numbers of children are entering the foster care system or being cared for by grandparents as a result of parental death, incarceration, or addiction.

Surrogate parenting by grandparents is a well-established pattern in Black and Latino families. It is more common among grandmothers, especially those living in poverty. They are also likely to be younger and have lower educational levels (Blieszner & Roberto, 2006; Dolbin-McNab & Hayslip, 2014; Dunifon et al., 2014).

Unexpected surrogate parenthood can be a physical, emotional, and financial drain on middle-age or older adults (Blieszner & Roberto, 2006). They may have to quit their jobs, shelve their retirement plans, drastically reduce their leisure pursuits and social life, and endanger their health.

Taking over the full care of grandchildren can be psychologically and physically taxing (Hadfield, 2014). With respect to physical health, studies have indicated custodial grandparents are at higher risk of poor physical health (Neely-Barnes et al., 2010; Musil et al., 2010). Custodial grandparents also report higher levels of anxiety, stress, and particularly depression, and those who are caring for children with social, behavioral, or emotional problems are particularly at risk (Doley et al., 2015; Minkler & Fuller-Thomson, 2001; Neely-Barnes et al., 2010). They may also feel judged as having done a poor job at raising their own children or ashamed at being in the position of raising grandchildren (Hayslip et al., 2017). High levels of social support can help grandparents deal with the difficulties of parenting their grandchildren and are associated with better psychological health (Hayslip et al., 2014).

Grandparents providing **kinship care** who do not become foster parents or gain custody have no legal status and few rights. They may face many practical problems, from enrolling the child in school and gaining access to academic records to obtaining medical insurance for the child. Grandchildren are usually not eligible for coverage under employer-provided health insurance even if the grandparent has custody. Moreover, kinship families are not legally entitled to as many benefits as foster families (Lin, 2014), despite research showing that kinship care allows children to remain connected to their family networks and cultural traditions (Kiraly & Humphreys, 2013). Like working parents, working grandparents need good, affordable child care and family-friendly workplace policies, such as time off to care for a sick child.

#### kinship care

Care of children living without parents in the home of grandparents or other relatives, with or without a change of legal custody.

#### checkpoint

can you ...

- Tell how parents' divorce and remarriage can affect grandparents' relationships with grandchildren?
- Discuss the challenges involved in raising grandchildren?
- Tell how grandparenthood has changed in recent generations?
- Describe the roles grandparents play in family life?

# summary and key terms

## Theoretical Models of Change at Midlife

- Research looking at midlife used to be relatively rare, but changing demographics in the United States have sparked renewed interest in midlife.
- Trait models suggest developmental change as well as changes in response to life events. Some processes may be culturally specific.
- Erikson's seventh psychosocial stage is generativity versus stagnation. Generativity can be expressed through parenting and grandparenting, teaching or mentorship, productivity or creativity, self-development, and "maintenance of the world." The virtue of this period is **care**. Current research on generativity finds it most prevalent at middle age but not universally so.
- The greater fluidity of the life cycle today has partly undermined the assumption of a social clock.  
**generativity versus stagnation** (463)  
**generativity** (463)

## Issues and Themes at Midlife

- Key psychosocial issues and themes during middle adulthood concern the existence of a midlife crisis, identity development (including gender identity), and psychological well-being.
- Research does not support a normative midlife crisis. It is more accurate to refer to a transition that may be a psychological turning point.
- According to Whitbourne's identity process theory, people continually confirm or revise their perceptions about themselves on the basis of experience and feedback from

others. Identity processes typical of an individual can predict adaptation to aging.

- Generativity is an aspect of identity development.
- Narrative psychology describes identity development as a continuous process of constructing a life story. Highly generative people tend to focus on a theme of redemption.
- Emotionality and personality are related to psychological well-being.
- Research based on Ryff's six-dimensional scale has found that midlife is generally a period of positive mental health and well-being, though socioeconomic status is a factor.  
**midlife crisis** (467)  
**turning points** (468)  
**midlife review** (468)  
**ego resiliency** (468)  
**identity process theory (IPT)** (468)  
**identity schemas** (468)  
**identity assimilation** (468)  
**identity accommodation** (470)  
**identity balance** (470)

## Relationships at Midlife

- Two theories of the changing importance of relationships are social convoy theory and socioemotional selectivity theory. According to both theories, socioemotional support is an important element in social interaction at midlife and beyond.
- Relationships at midlife are important to physical and mental health but also can present stressful demands.  
**social convoy theory** (474)  
**socioemotional selectivity theory** (475)

## Consensual Relationships

- Research on marriage satisfaction indicates there is generally an initial rapid decline, followed by a plateau, and then further, slower declines over the long term. The birth of a child is associated with steep declines, whereas sexual satisfaction is associated with marital satisfaction.
- Cohabitation is increasing in midlife but may negatively affect men's well-being.
- Divorce at midlife can be stressful and life-changing. Marital capital tends to dissuade midlife divorce.
- Divorce today may be less threatening to well-being in middle age than in young adulthood.
- Married people tend to be healthier at middle age than people with any other marital status.
- Because some gays and lesbians delayed coming out, at midlife they may be just establishing intimate relationships.
- Middle-aged people tend to invest less time in friendships than younger adults do but depend on friends for emotional support and practical guidance.

**marital capital** (480)

## Relationships with Maturing Children

- Parents of adolescents have to come to terms with a loss of control over their children's lives.
- The emptying of the nest is liberating for many women but may be stressful for couples whose identity is dependent on the parental role or those who now must face previously submerged marital problems.
- Middle-aged parents tend to remain involved with their adult children, and most are generally happy with the way their children turned out. Conflict may arise over grown children's need to be treated as adults and parents' continuing concern about them.
- Today, more young adults are delaying departure from their childhood home or are returning to it. Adjustment tends to be smoother if the parents see the adult child as moving toward autonomy.

**empty nest** (482)

**revolving door syndrome** (483)

## Other Kinship Ties

- Relationships between middle-aged adults and their parents are usually characterized by a strong bond of affection. The two generations generally maintain frequent contact and offer and receive assistance. Aid flows mostly from parents to children.
- As life lengthens, more and more aging parents become dependent for care on their middle-aged children. Acceptance of these dependency needs may be the outcome of a filial crisis.
- The chances of becoming a caregiver to an aging parent increase in middle age, especially for women.
- Caregiving can be a source of considerable stress but also of satisfaction. Community support programs can help prevent caregiver burnout.
- Although siblings tend to have less contact at midlife than before and after, most middle-aged siblings remain in touch, and their relationships are important to well-being.
- Most US adults become grandparents in middle age and have fewer grandchildren than in previous generations.
- Geographic separation does not necessarily affect the quality of grandparenting relationships.
- Divorce and remarriage of an adult child can affect grandparent-grandchild relationships.
- A growing number of grandparents are raising grandchildren whose parents are unable to care for them. Raising grandchildren can create physical, emotional, and financial strains.

**filial crisis** (484)

**sandwich generation** (485)

**caregiver burnout** (486)

**kinship care** (489)

## outline

Old Age Today

### PHYSICAL DEVELOPMENT

Longevity and Aging

Physical Changes

Physical and Mental Health

### COGNITIVE DEVELOPMENT

Cognitive Changes

## learning objectives

Discuss the causes and impact of the aging population.

Characterize longevity and discuss biological theories of aging.

Describe physical changes in late adulthood.

Identify factors that influence health and well-being in late adulthood.

Describe the cognitive functioning of older adults.

# Physical and Cognitive Development in Late Adulthood



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## did you know?

- By 2050, the population of people 65 and over is projected to be 1.6 billion worldwide.
- In many parts of the world, the fastest-growing age group consists of people in their eighties and older.
- Older brains can grow new nerve cells—something once thought impossible.

*In this chapter, we begin by sketching demographic trends among today's older population. We look at the increasing length and quality of life in late adulthood and at causes of biological aging. We examine physical changes and health. We then turn to cognitive development: changes in intelligence and memory, the emergence of wisdom, and the influence of continuing education in late life. We consider the influence of contextual influences—such as socioeconomic factors and culture—on these processes, and examine how they interact with important individual differences such as race and ethnicity.*



**W**e carry accumulation of years in our bodies, and on our faces, but generally our real selves, the children inside, are innocent and shy as magnolias.

—Maya Angelou (1928–2014)

## Old Age Today

In Japan, old age is a status symbol; travelers checking into hotels there are sometimes asked their age to ensure that they will receive proper deference. In the United States, by contrast, aging is generally seen as undesirable. Negative stereotypes about aging, internalized in youth and reinforced for decades by societal attitudes, may become self-stereotypes, unconsciously affecting older people's expectations about their behavior and often acting as self-fulfilling prophecies (Levy, 2003).

Today, efforts to combat **ageism**—prejudice or discrimination based on age—are making headway, thanks to the growing visibility of active, healthy older adults. Reports about aging achievers appear frequently in the media. On television, older people are less often portrayed as dotards and more often as level-headed, respected, wise, or cunning, a shift that may be important in the reduction of negative stereotypes about the elderly (Bodner, 2009).

We need to look beyond distorted images of age to its true, multifaceted reality. What does today's older population look like?

The most consistent stereotypes of the elderly are that although they are generally seen as warm and loving, they are also seen as incompetent and low in status (Cuddy et al., 2005; Cary & Chasteen, 2015).



### ageism

Prejudice or discrimination against a person (most commonly an older person) based on age.

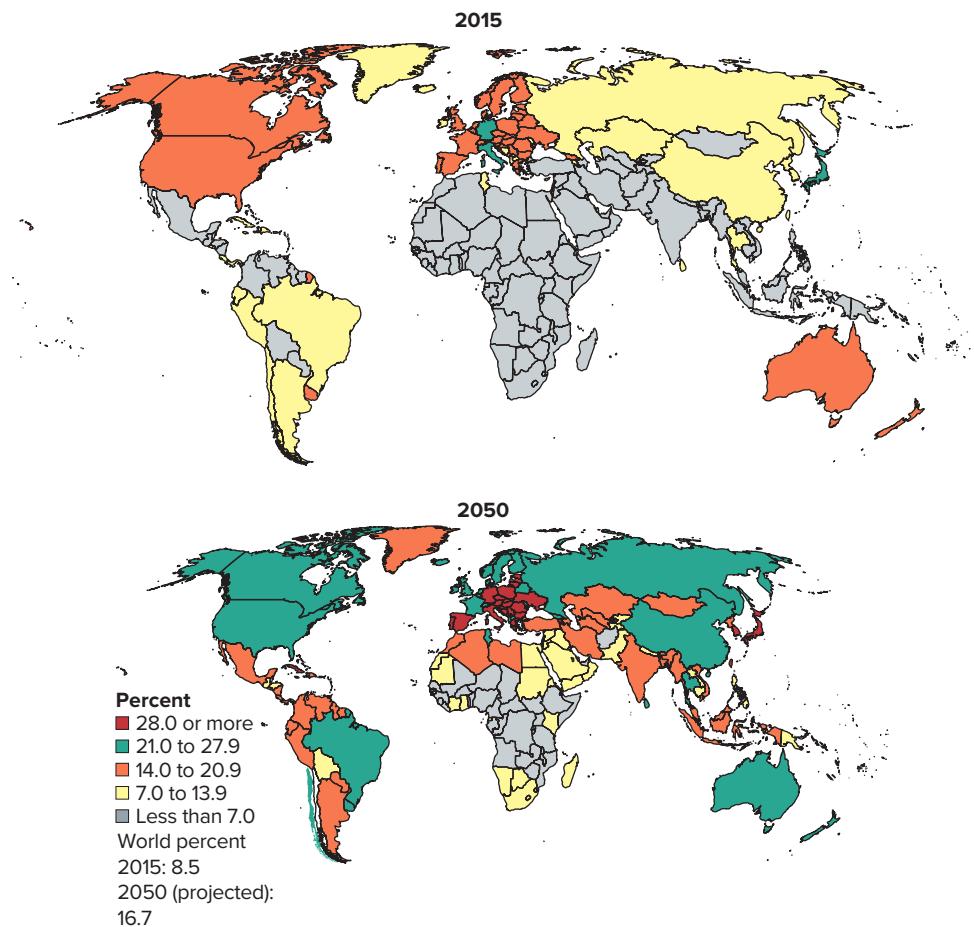


The growing visibility of such active, healthy older adults as actor Helen Mirren is changing the perception of old age.  
s\_bukley/Shutterstock

### THE GRAYING OF THE POPULATION

In 2018, the world reached a milestone: For the first time, people 65 years and older outnumbered children. In 2019, 1 in 11 people worldwide was age 65 or older, and projections are that by 2050, 1 in 6 people will be over 65 years old (United Nations, 2019). Most of these older adults will be living in low- and middle-income countries rather than in the high-income countries where this demographic shift first began (World Health Organization, 2018). Aging populations result from declines in fertility accompanied by economic growth, better nutrition, healthier lifestyles, improved control of infectious disease, safer water and sanitation facilities, and advances in science, technology, and medicine (He et al., 2016).

Countries vary with respect to how aged their populations are (see Figure 1). The population of people 80 and older is projected to almost triple between 2019 and 2050, from 143 million to 426 million (United Nations, 2019). By contrast, the percentage rate increase predicted for adults aged 65 and older is about 1.5 times the current numbers, and there is an almost flat percentage change pre-



**FIGURE 1**

Percentage of Population Age 65 and Older: 2015 and 2050

*The growth of the population age 65 and up is projected to increase rapidly in the coming decades. Growth will be greatest in much of the developing world.*

Source: He et al. (2016).

dicted in people under the age of 20 (He et al., 2016). Different countries have met the increased needs of their aging populations with varying levels of success (see Window on the World).

In the United States, the graying of the population is due to high birthrates and high immigration rates during the early to mid-twentieth century and a current trend toward smaller families, which has reduced the relative size of younger age groups. The aging of baby boomers—the surge of people born following World War II—is a large factor. By 2060, population projections suggest there will be 94.7 million adults age 65 and over in the United States. The 85-and-older population is also expected to increase to approximately 14.4 million people in 2040—an increase of 129 percent over 2016 (Administration for Community Living, 2021).

Although racial and ethnic minority populations in the United States are, as a whole, younger than the White population, ethnic diversity among older adults is nonetheless increasing. In 2019, 24 percent of Americans age 65 and older were members of minority groups; by 2040, 34 percent will be. The largest group is African American (9 percent), followed by Asian or Pacific Islander (5 percent), Native American or Alaska Native (0.6 percent), Native Hawaiian/Pacific Islander (0.1 percent), and multiracial adults (0.8 percent). Hispanics, who can be any race, are approximately 9 percent of this population (Administration for Community Living, 2021).

# Window on the world

## ELDER CARE WORLDWIDE

As the world ages, countries must adjust to the demographic shifts and changing needs of their populations. One pressing need is that for elder care. Both the number of people eligible for programs supporting the elderly and the duration that people require their assistance are growing.

The Global Age Watch Index ranks countries based on how well older people are doing. It measures four aspects of elder welfare: income security, health status, capability, and the enabling environment (aspects that help elders to independently care for themselves). Of the 195 countries assessed, the United States ranked ninth. Most of the European countries were in the top half, and the bottom 20 countries consisted mostly of African, Middle Eastern, and Southeast Asian countries (HelpAge International, 2015).

The top ranking went to Switzerland—where one-fourth of the population is older than 60—because of its many programs promoting health, capability, and activity for the aging population, as well as universal health care and pension plans for all citizens. Nearly one-third of Japan's population is over 60; at number eight in the ranking, Japan is considered one of the oldest and healthiest countries in the world. It has comprehensive policies in place for the elderly, including universal health care and pension plans.

Both India (71) and China (52) have many elderly adults and major disparities in quality of health care.

In India, 80 percent of the elderly live in rural areas, and 40 percent live below the poverty line; there is no official social security or pension plan for the elderly. Chinese elders fare somewhat better with both physical and mental health. The discrepancies are worse in both countries for those older than 75.

Malawi and Mozambique have very few programs for elders. They rank lowest in income security, and as a result, 95 percent of the elderly still work. There are no universal pension programs, and access to health care is very limited. In both countries, chronic diseases are rampant. Elder abuse—financial, physical, and sexual—is common. Many elderly people report feeling unsafe and devalued.

Inequality is apparent between the top- and bottom-ranked countries. In the highest-income countries, nearly all people older than 65 receive some sort of pension and health care. In the low- and middle-income countries, about 25 percent receive a pension or quality health care. Much still needs to be done to equalize elder care worldwide.



In countries with limited budgets, what priority should the elderly hold when considering funding for social services? Are they equally, more, or less important than other age groups? Why?

## CONCEPTUALIZATION OF AGING

The economic impact of a graying population depends on the proportion of the population that is healthy and able-bodied. In this regard, the trend is encouraging. Many problems that we used to think were the result of age have been determined to be due to lifestyle factors or disease.

**Primary aging** is a gradual, inevitable process of bodily deterioration that begins early in life and continues through the years irrespective of what people do to stave it off. In this view, aging is an unavoidable consequence of getting older. **Secondary aging** results from disease, abuse, and disuse—factors that are often within a person's control (Horn & Meer, 1987). These two philosophies of aging can be likened to the familiar nature-nurture debate. Primary aging is a nature process governed by biology. Secondary aging is the result of nurture, the environmental insults that accrue over the course of a lifetime. As always, the truth lies somewhere in between, and both factors matter.

Today, social scientists who specialize in the study of aging refer to three groups of older adults: the “young old,” “old old,” and “oldest old.” These terms represent social constructions similar to the concept of adolescence. Chronologically, young old generally

### primary aging

Gradual, inevitable process of bodily deterioration throughout the life span.

### secondary aging

Aging processes that result from disease and bodily abuse and disuse and are often preventable.

#### activities of daily living (ADLs)

Essential activities that support survival, such as eating, dressing, bathing, and getting around the house.

### checkpoint can you . . .

- ▶ Discuss the causes and impact of the aging population?
- ▶ State two criteria for differentiating among the young old, old old, and oldest old?
- ▶ Differentiate between primary and secondary aging?

refers to people age 65 to 74, who are usually active, vital, and vigorous. The old old, age 75 to 84, and the oldest old, age 85 and above, are more likely to be frail and infirm and to have difficulty managing **activities of daily living (ADLs)**. As a result, the oldest old consume a disproportionate number of resources such as pensions or health care costs given their population size (Kinsella & He, 2009).

A more meaningful classification is **functional age**: how well a person functions in a physical and social environment in comparison with others of the same chronological age. For example, a person of 90 who is still in good health and can live independently may be functionally younger than a 75-year-old suffering the effects of dementia.

The use of these terms and age distinctions has arisen out of research and service needs. **Gerontology** is the study of the aged and aging processes. Gerontologists are interested in differences between elderly people because these differences can influence outcomes. Likewise, researchers and service providers in **geriatrics**, the branch of medicine concerned with aging, are concerned with differences among the elderly. Understanding differences among the elderly has underlined the need for support services that people in age groups such as the oldest old may need; for example, some in this age group have outlived their savings and cannot pay for their own care.

# PHYSICAL DEVELOPMENT

## Longevity and Aging

#### functional age

Measure of a person's ability to function effectively in their physical and social environment in comparison with others of the same chronological age.

#### gerontology

Study of the aged and the process of aging.

#### geriatrics

Branch of medicine concerned with processes of aging and medical conditions associated with old age.

#### life expectancy

Age to which a person in a particular cohort is statistically likely to live (given their current age and health status), on the basis of average longevity of a population.

#### longevity

Length of an individual's life.

#### life span

The longest period that members of a species can live.

*Keep in mind that life expectancy doesn't reflect the average age at which someone dies. It includes all deaths across the life span. Therefore, a short life expectancy can sometimes signify a high infant mortality rate, which pulls down the number.*



### CORRELATES OF LIFE EXPECTANCY

A baby born in the United States in 2018 can expect to live to 78.7 years, more than 30 years longer than a baby born in 1900 and more than 4 times longer than a baby born at the dawn of human history (National Center for Health Statistics, 2021; Wilmoth, 2000; Figure 2). Much of this increase can be attributed to the influence of antibiotics, vaccination programs, and improved sanitary practices. Life expectancy rates then began to be affected more by deaths from chronic diseases such as heart disease and cancer, and while it continued to rise in the middle of the twentieth century, the change was less dramatic. Most recently, life expectancy declined in the United States by approximately 1.67 years due COVID-19 mortality rates, reversing 14 years of life expectancy gains. Most of the effects were attributable to deaths directly caused by COVID-19; however, approximately 17 percent resulted from indirect effects of the pandemic (Chan et al., 2021), such as might occur when adults avoid preventative health care services or delay surgery out of a fear of infection. Globally, life expectancy was also affected by the pandemic. In one international survey, life expectancy declined in 31 of 37 countries examined and accounted for 28 million years of life lost (Islam et al., 2021).

**Gender Differences** Nearly everywhere, women live longer and have lower mortality rates at all ages than men. By the age of 65, there are approximately 80.3 men for every 100 women; by age 85, there are only 50 men for every 100 women; and by age 100, women outnumber men by 4 to 1 (He et al., 2016).

The gender gap is widest in high-income industrialized nations, where female mortality dropped sharply with improvements in prenatal and obstetric care. In fact, forecasting models predict there is more than a 50 percent probability that women's life expectancy will surpass 90 years of age by 2030 (Kontis et al., 2017). In part, women's longer lives may indicate greater physiological resilience. However, women's longer lives also have been attributed to their greater tendency to take care of themselves and to seek medical care, the higher level of social support they enjoy, and the rise in women's socioeconomic status in recent decades. Further, men are more likely to smoke, drink, and be exposed to dangerous toxins (Carmel, 2019).

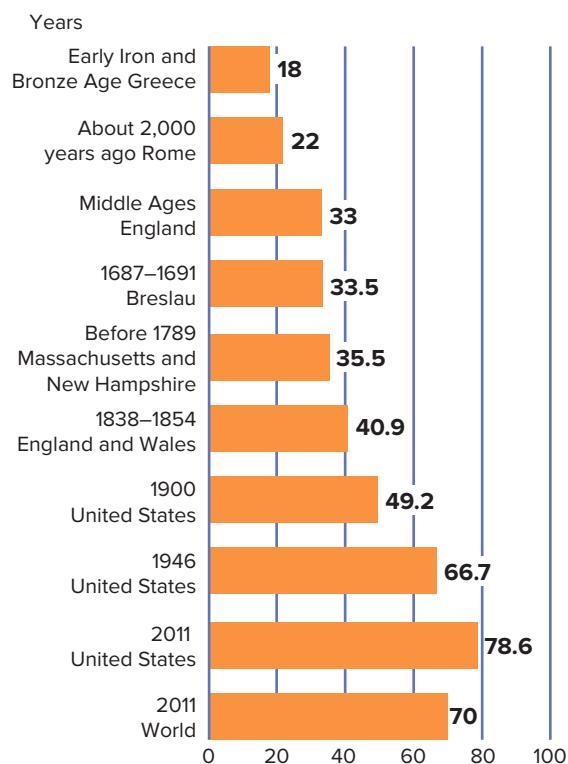
In the United States, women's life expectancy in 1900 was only 2 years longer than men's. The gender gap widened to 7.8 years in the late 1970s, mainly because more men were dying from smoking-related illnesses (heart disease and lung cancer) and fewer women were dying in childbirth. Since then, the gap has narrowed to 5 years (National Center for Health Statistics, 2021).

**Regional Differences in Mortality Risk** Global life expectancy was 72 years in 2016. However, the gap in life expectancies between developed and developing countries is vast. In the African nation of Sierra Leone, a man born in 2016 could expect to live 52.5 years, as compared to 87.1 years for a woman born in Japan (World Health Organization, 2018). The most dramatic improvements in life expectancy between 2000 and 2015 occurred in Africa, where improvements in child survival and the treatment of malaria and HIV increased life expectancy by 9.4 years (World Health Organization, 2016).

Estimates are that as of January 2022, approximately 5.67 million deaths across the globe were attributable to COVID-19 infection (Worldometer, 2022). Age, along with accompanying conditions that tend to increase with age (such as heart disease and diabetes), are key risk factors for COVID mortality (Caramelo et al., 2020). Thus, the pandemic has had its greatest effects on mortality and risk in elderly populations. However, because of differences in how well countries were able to control the pandemic, there were considerable variations in risk across countries. For example, the death rate for adults age 70 to 79 years of age was 2.4 deaths per 1,000 in Brazil, as compared to 1.5 per 1,000 people in the United States and 0.0004 deaths per 1,000 people in China. Although a multitude of factors influenced risk, the primary determinant of how COVID-19 affected elderly people in different regions was the extent to which countries were able to control the spread of the virus and implement mitigation procedures such as masks and vaccines (United Nations, 2020).

A new way to look at life expectancy is in terms of the number of years a person can expect to live in good health, free of disabilities. Globally, healthy life expectancy (HLE) is 62 years for men and 64.8 years for women. In the United States, HLE is estimated to be 68.5 years of age (World Health Organization, 2018).

**Racial and Ethnic Differences in Mortality Risk** Detailed data on the direct influence of racial and ethnic differences on mortality risk are few. However, there are indications that across a variety of countries, even when socioeconomic status is held constant, mortality risk is influenced by race and ethnicity. In particular, multiple studies have shown Black and Asian ethnic groups have a higher risk of death than do other ethnic and racial groups. The increased risk, according to many researchers, is due to factors



**FIGURE 2**

Changes in Life Expectancy from Ancient to Modern Times

Sources: Adapted from Katchadourian (1987); World Bank (2019).



*In Sierra Leone, a male child born in 2016 could expect to live 52.5 years.*

Fabian von Poser/imageBROKER/Alamy Stock Photo

**TABLE 1** Life Expectancy in Years for . . .

	<b>At Birth</b>
Hispanic men	79.1
Hispanic women	84.3
White men	76.2
White women	81.1
African American men	71.3
African American women	78.0

Source: National Center for Health Statistics (2021).

### checkpoint can you . . .

- ▶ Distinguish life expectancy, longevity, and life span?
- ▶ Summarize trends in life expectancy, including gender, regional, and ethnic differences?

#### senescence

Period of the life span marked by declines in physical functioning usually associated with aging; begins at different ages for different people.

#### genetic-programming theories

Theories that explain biological aging as resulting from a genetically determined developmental timetable.

such as structural inequality, limited access to health care, unsafe communities, and occupational factors such as unsafe working conditions. Moreover, ethnic and racial discrimination also plays a role (Yaya et al., 2020; Razai et al., 2021). Multiple large-scale studies have illustrated a strong link between racial discrimination and mental and physical health (Carter et al., 2019; Williams et al., 2019).

The racial and ethnic disparities in life expectancy and mortality risk also exist in the United States (see Table 1). On average, White Americans live 3.9 years longer (78.6 years) than African Americans (74.7 years). African Americans, especially men, are more vulnerable than White Americans to illness and death from infancy through middle adulthood. Somewhat surprisingly, Hispanic Americans have the highest life expectancy (81.8 years). The reasons for this are somewhat

unclear but may include cultural lifestyle factors or migration effects (e.g., healthier individuals are more likely to attempt the arduous migration process to the United States) (National Center for Health Statistics, 2021).

Income and geography also affect life expectancy. Higher socioeconomic status is associated with an increase in life expectancy, and the degree of disparity in life expectancy across income groups has increased in the last decade. Additionally, life expectancy is lowest in the southern United States. It is likely these regional differences are related to health behaviors, including smoking, obesity, and exercise, rather than differential access to health care (Chetty et al., 2016).

## THEORIES OF AGING

As we get older, we may feel the effects of various chronic conditions or diseases. This process is known as **senescence**, the decline in body functioning associated with aging. Why does senescence occur? Why do we grow old? Most theories about biological aging fall into one of two categories (summarized in Table 2): genetic-programming theories and variable-rate theories.

**Genetic-Programming Theories** Is aging an inevitable biological process? **Genetic-programming theories** propose that people's bodies age according to instructions built into the genes and that aging is a normal part of development.

**TABLE 2** Theories of Biological Aging

<b>Genetic-Programming Theories</b>	<b>Variable-Rate Theories</b>
<i>Programmed senescence theory.</i> Aging is the result of sequential switching on and off of certain genes. Senescence is the time when the resulting age-associated deficits become evident.	<i>Wear-and-tear theory.</i> Cells and tissues have vital parts that wear out.
<i>Endocrine theory.</i> Biological clocks act through hormones to control the pace of aging.	<i>Free-radical theory.</i> Accumulated damage from oxygen radicals causes cells and eventually organs to stop functioning.
<i>Immunological theory.</i> A programmed decline in immune system functions leads to increased vulnerability to infectious disease and thus to aging and death.	<i>Rate-of-living theory.</i> The greater an organism's rate of metabolism, the shorter its life span.
<i>Evolutionary theory.</i> Aging is an evolved trait; thus, genes that promote reproduction are selected at higher rates than genes that extend life.	<i>Autoimmune theory.</i> Immune system becomes confused and attacks its own body cells.

Twin studies have shown that genetic differences account for about one-fourth of the variance in the adult human life span. The genetic influences on aging appear to become stronger over time, especially after age 60 (Willcox et al., 2008; Finkel et al., 2014). With the exception of some rare genetic disorders, there is not “a” gene for aging. Rather, aging in typical people involves many gene variants, each with small effects. For example, in one study of 658,000 people, researchers identified 11 paternal and 4 maternal genetic loci associated with longevity (Wright et al., 2019).

Aging also may be influenced by specific genes “switching off,” after which age-related losses (such as declines in vision, hearing, and motor control) occur. This process, broadly described as epigenesis, involves genes being turned on and off by molecular “tags,” or instructions. Epigenetic changes do not involve changes in the underlying genetic code; rather, they involve changes in how genes are expressed. The accumulation of epigenetic changes is partly responsible for aging (Pagiatakis et al., 2021; Sierra et al., 2015). Because epigenetic changes are dynamic and modifiable by environmental influences, positive interventions may be able to combat the effects of aging (Field et al., 2018). For example, diet and lifestyle changes can change our epigenetic expression and slow the rate of decline (Pal & Tyler, 2016).

Another cellular process involves telomeres, the repetitive fragments of DNA on the tips of chromosomes. Every time a cell divides, replicating its genetic code, the telomeres become shorter. Some theorists argue that cells can divide only a fixed number of times—eventually, they run out of telomeres. Leonard Hayflick (1974) found that human cells will divide in the laboratory no more than 50 times, a number now known as the **Hayflick limit**. Hayflick (1981) argued cells go through the same process in the body as in a laboratory culture. Once cells can no longer replicate, the body loses its ability to repair damaged tissue and thus begins to age.

In support of this theory, research shows that telomeres shorten with age and that the rate of telomere shortening is related to the rate of aging (Zhu et al., 2019). Shorter telomeres result in accelerated aging and risk of early death, and they are associated with increased risk of cancer, stroke, diabetes, dementia, chronic obstructive pulmonary disease, and skin disorders (Chilton et al., 2017). The rate of telomere change is genetically influenced and interacts with environmental influences in a complex fashion over the course of the life span (Honig et al., 2015; Dugdale & Richardson, 2018). Environmental factors that are known to be associated with disease and mortality, such as stress, smoking, alcohol use, and physical inactivity, can all affect the rate of telomere shortening (Shalev et al., 2013; Astuti et al., 2017; Li et al., 2018; Arsenis et al., 2017).

According to endocrine theory, the biological clock acts through genes that control hormonal changes. Loss of muscle strength, accumulation of fat, and atrophy of organs may be related to declines in hormonal activity (Lamberts et al., 1997). For example, mutations in the genes that code for hormones involved in the regulation of blood sugar have been linked in other species to either increased or decreased life span, and it is likely they function similarly in humans (Van Heemst, 2010). Immunological theory proposes a similar process; certain genes may cause problems in the immune system (Holliday, 2004) that then lead to an increased susceptibility to diseases, infections, and cancer (Fulop et al., 2014).

According to the evolutionary theory of aging, reproductive fitness is the primary aim of natural selection. Therefore, natural selection acts most strongly on the young, who have many years of potential reproduction ahead of them. If a trait favoring reproductive output in the young is present, it will spread throughout the population, even if the effects are later damaging to the individual (Hamilton, 1966; Kulminski et al., 2018). Moreover, natural selection results in energy resources being allocated to protect and maintain the body until reproduction but not necessarily after. After reproduction has ceased, the molecular integrity of the body cells and systems eventually deteriorates beyond the body’s ability to repair them (Hayflick, 2004). This deterioration occurs because there is no selective pressure to prevent it once genes have been passed on to the next generation.

#### Hayflick limit

Genetically controlled limit, proposed by Hayflick, on the number of times cells can divide in members of a species.

#### variable-rate theories

Theories that explain biological aging as a result of processes that involve damage to biological systems and that vary from person to person.

#### free radicals

Unstable, highly reactive atoms or molecules, formed during metabolism, that can cause internal bodily damage.

#### survival curve

A curve on a graph showing the percentage of people or animals alive at various ages.



Jeanne Calment was a French woman with the longest confirmed life span. She lived a total of 122 years and 164 days.

Pascal Parrot/Sygma/Getty Images

**Variable-Rate Theories** Why might one older adult suffer from arthritis, poor health, and declining perceptual abilities and another remain active and engaged? According to **variable-rate theories**, aging is the result of random processes that vary from person to person. They are also called error theories because these processes often involve damage due to chance errors in, or environmental assaults on, biological systems.

One such theory, wear-and-tear theory, holds that the body ages as a result of accumulated damage to the system at the molecular level. Like an old car, the parts of the body eventually wear out (Jin, 2010). Some theorists have argued that while this sounds commonsensical, there is no fundamental reason bodies could not be made to continually regenerate, as they do in youth (Mitteldorf, 2010).

Another theory of aging, known as the free-radical theory, proposes that aging results from the formation of **free radicals**, a by-product of metabolic processes (Harman, 1956). Free radicals are molecules with unpaired electrons. This makes them very reactive because they seek to pair their electrons and will “steal” electrons from neighboring atoms. This process can ultimately damage cell membranes, structures and proteins, fats, carbohydrates, and even DNA. Moreover, free-radical damage accumulates with age and has been associated with cardiovascular disease, cancer, inflammatory diseases such as arthritis, heart disease, neurological disorders such as Parkinson’s disease and Alzheimer’s disease, gastric ulcers, and many others (Lobo et al., 2010; Barnes et al., 2019).

Some researchers argue their role in the aging process has been overstated (Gladyshev, 2014). For instance, free radicals, while causing damage, may also play a signaling role by helping regulate genes necessary for cell growth and differentiation (Son & Lee, 2019).

The free-radical theory was expanded to the mitochondrial theory of aging. Mitochondria—tiny organisms that generate chemical energy for cells and tissues—play an important role in helping cells survive under stress and powering the body. However, when mitochondria generate energy, they also create free radicals as by-products. These free radicals can negatively affect surrounding tissues, including their own mitochondrial DNA. This leads to even more free radical release, more damage, and the aging process (Harman, 2006; Ziegler et al., 2015).

The rate-of-living theory postulates that there is a balance between metabolism, or energy use, and life span. The faster a body’s metabolism, the shorter its life span, and vice versa (Pearl, 1928). So, for example, a hummingbird would be predicted to have a shorter life than a sloth. While this theory is useful in describing some phenomena, for example, when broadly comparing small and large animals to each other, it does not explain many aspects of aging. For example, exercise, which increases metabolic activity, would be predicted to shorten life span. In reality, it has the opposite effect (Hulbert et al., 2007).

Genetic-programming and variable-rate theories have practical implications. If human beings are programmed to age at a certain rate, they can do little to retard the process. If, on the other hand, aging is variable, then lifestyle practices may influence it.

Some researchers have suggested that rather than focusing on how to extend the human life span, it makes more sense to consider how we can improve human health while aging (Partridge, 2010). Still, interest in increasing the life span remains. Controllable environmental and lifestyle factors may interact with genetic factors to determine how long a person lives and in what condition.

## EXTENDING THE HUMAN LIFE SPAN

Most people understand that more people survive to the age of 40 than to 60 and that more people survive to the age of 60 than to 80. When translated into statistical terms, this concept is known as a **survival curve**. A survival curve represents the percentage of people or animals alive at various ages. With respect to humans, the curve currently ends roughly at age 100, meaning few people survive past this age.

Can the human life span be extended? Scientists have extended the healthy life spans of yeast, worms, fruit flies, and mice through various interventions, including slight

genetic alterations and special diets (Fontana et al., 2010; Selman & Withers, 2011). These findings are intriguing, but because no single gene or process seems responsible for senescence and the end of life, we are unlikely to find genetic quick fixes for human aging (Holliday, 2004). Moreover, techniques that show promise in shorter-lived species may not apply to humans.

Optimists, however, point to data showing continued increases in longevity. In the United States, the number of centenarians increased from roughly 32,000 in 1980 to approximately 100,322 in 2016 (Administration for Community Living, 2021). Data show that while different dynamics are playing out in different countries, the increase in longevity is not uncommon (World Health Organization, 2019). Interestingly, death rates actually decrease after 100 (Coles, 2004). People at 110 are no more likely to die in a given year than people in their eighties (Vaupel et al., 1998). In other words, people hardy enough to reach a certain age are likely to go on living a while longer.

Why do some people live so much longer than others? Genetics appears explain about 25 percent of the variation in human longevity (Passarino et al., 2016). Centenarians possess longevity-assuring genes that seem to counteract age-related molecular damage, loss in function, and cognitive decline (Arai et al., 2014; Arai, 2017). Lifestyle factors are also key influencers of longevity and successful aging, with the most important lifestyle factor likely being exercise (Gremeaux et al., 2012). Exercise, in addition to physical health, is associated with the preservation of cognitive health. This may be because exercise is linked to increased oxygen consumption and cerebral blood flow (Blondell et al., 2014).

Successful aging also has much to do with psychosocial factors. For instance, social interactions are strongly associated and interact with positive affect (Cho et al., 2015). Although all people benefit from social interaction, those who have greatest levels of education and better cognitive functioning are able to engage in more frequent and intense social interactions, which, in turn, contributes to higher levels of positive affect. Similarly, family contact, specifically when such interaction is positive, may help stave off depressive symptoms and promote well-being (Fuller-Iglesias et al., 2015).

When people who live to be very old are examined, it appears that **morbidity**—or being in a state of disease—is being compressed. In other words, these people are reaching old age in relatively good health. However, once they begin to deteriorate, they do so very quickly. So, while the overall rate of aging is unchanged, the process of aging itself seems to have been postponed, presumably because of good health (Andersen et al., 2012). Given this finding, the question then becomes: Can we postpone aging even more, delay aging until even longer, and thus increase the life span? This has been termed the longevity riddle (Vaupel, 2010).

Although the answer to this question remains to be seen, the question raises important issues. It suggests that increasing the healthy life span—a goal worthy in itself—may itself increase life expectancy. It also suggests the most fruitful area for longevity interventions should be focused on risk reduction and living a healthy lifestyle (Fries et al., 2011). There are also economic benefits to this approach. Morbidity compression could lead to people living longer lives, while simultaneously decreasing medical costs because of the compression of poor health at the tail end of the life span (Cutler et al., 2013).

One line of research—inspired by rate-of-living theories that view energy use as the crucial determinant of aging—is on dietary restriction. Drastic caloric reduction has been found to greatly extend life in worms, fish, and monkeys—in fact, in nearly all animal species on which it has been tried (Colman et al., 2014; Heilbronn & Ravussin, 2003). A review of 15 years of research suggests that calorie restriction can have beneficial effects on human aging and life expectancy (Fontana & Klein, 2007). Calorie-restricted monkeys also show less of the brain atrophy that sometimes accompanies aging (Colman et al., 2009), a finding that may have implications for brain health. There are multiple studies in both humans and other primates demonstrating that calorie restriction, as long as nutrients such as vitamins and minerals are consumed in adequate amounts, is associated with positive changes in markers related

#### **morbidity**

The condition of being in a state of disease.



If you could live as long as you wanted, how long would you choose to live? What factors would affect your answer?



People who, when they were young, held negative stereotypes of the elderly were more likely to experience heart problems later in life (Levy et al., 2009).

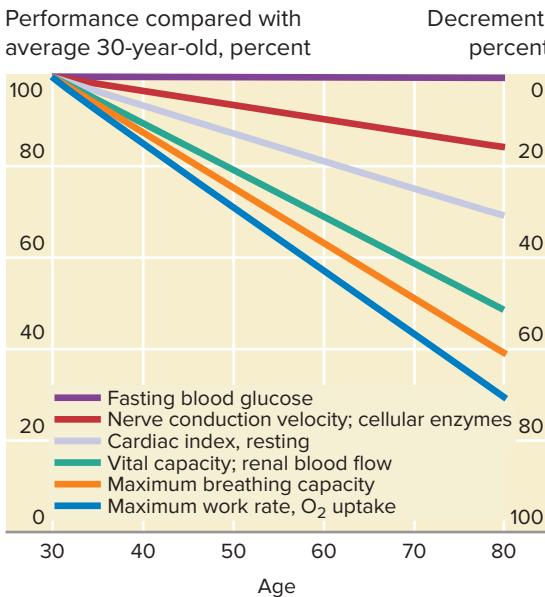
## checkpoint can you ...

- Compare two types of theories of biological aging and discuss their implications and supporting evidence?
- Discuss findings of life-extension research and its limitations in human beings?

to disease risk and aging. For instance, in humans, calorie restriction is associated with a reduced incidence of heart disease, cancer, and diabetes, as well as reduced damage or loss of neurons, fewer age-related declines in muscle tissue, and less hearing loss (Most et al., 2017).

Although calorie restriction might lengthen life, it takes a great deal of discipline to maintain and is unsustainable and unrealistic for most people. Because of this, there is increasing interest in developing drugs that mimic the effects of caloric restriction (Fontana et al., 2010). Intermittent fasting, where food is eaten only during some hours of the day, holds some promise. Research suggests it may exert a similar effect on metabolic processes as calorie restriction (Dorling et al., 2020) while being easier to maintain. Last, a more general and holistic approach to aging, with medications used before the advent of aging-related disease, might show more promise for extending life in humans (Partridge, 2010).

## Physical Changes



**FIGURE 3**

### Declines in Organ Functioning

*Differences in functional efficiency of various internal body systems are typically slight in young adulthood but widen by old age.*

Source: Katchadourian (1987).

#### reserve capacity

Ability of body organs and systems to put forth 4 to 10 times as much effort as usual under acute stress; also called *organ reserve*.

Some physical changes typically associated with aging are obvious to a casual observer. Older skin tends to become paler and less elastic, and, as fat and muscle shrink, the skin may wrinkle. Varicose veins may appear on the legs. The hair on the head thins and turns gray and then white, and body hair becomes sparser. Older adults become shorter as the disks between their spinal vertebrae atrophy. In addition, the chemical composition of the bones changes, creating a greater risk of fractures. Less visible but equally important changes affect internal organs and body systems; the brain; and sensory, motor, and sexual functioning.

### ORGANIC AND SYSTEMIC CHANGES

Changes in organic and systemic functioning are highly variable. Some body systems decline rapidly, others hardly at all (Figure 3). There are, however, typical age-related declines in most people. The lungs, for example, become less effective because of reductions in lung volume, atrophy in the muscles involved with breathing, and reductions in the ability of cilia (hairlike structures that clear mucus and dirt out of the lungs) to function effectively (Lowery et al., 2013). Additionally, there are normative age-related declines in immune system functioning (Oh et al., 2019); stress can exacerbate this process (Reed, 2019). Heart health suffers as well. Elderly adults are more likely to suffer from arrhythmia (irregular heartbeat), the muscle walls of the heart may thicken, and the valves that control the flow of blood in and out of the heart may no longer open completely. These heart changes result in impaired capacity for pumping blood and thus decreases in cardiovascular fitness (Lee et al., 2011). Chronic stress in older adults is also related to chronic low-grade

inflammation, making older adults more vulnerable to disease (Jurgens & Johnson, 2012; Wirtz & von Känel, 2017). Problems with swallowing food, gastric reflux, indigestion, irritable bowel syndrome, constipation, and reduced absorption of nutrients become more common with age as well (Grassi et al., 2011). This puts elderly people at higher risk of malnutrition (Harris, et al., 2008), especially if they have chronic diseases or are dependent on others for assistance in daily activities (Ülger et al., 2010; Saka et al., 2010).

**Reserve capacity** is the backup capacity that helps body systems function to their utmost limits in times of stress. With age, reserve levels tend to drop, and many older people cannot respond to extra physical demands as they once did. For example, a person who used to be able to shovel snow from the entire driveway easily may become exhausted from shoveling just the front entry.

## checkpoint can you ...

- Summarize common changes and variations in systemic functioning during late life?

## THE AGING BRAIN

As people become older, there are declines in the brain's ability to process information rapidly, in executive functioning, and in episodic memory (Fjell & Walhovd, 2010; Hughes et al., 2018). However, in normal, healthy people, changes in the aging brain are generally subtle and make little difference in functioning. This is because the brain retains a significant degree of plasticity and can compensate for the challenges of aging by reorganizing neural circuitry and working around the problem (Cabeza et al., 2018; Park & Gutchess, 2006). For example, there are age-related changes in functional connectivity, the ways in which different areas of the brain coordinate with each other during a task. In general, imaging studies have found reduced functional connectivity with age. However, at the same time, there is more diffuse activation (more brain areas are used for completing tasks) to compensate. This is particularly true when tasks are challenging (Liem et al., 2021). Younger adults are more likely to use localized areas of the brain during challenging tasks, whereas older adults are more likely to use more diffuse activation and utilize more or different brain areas as compensatory mechanisms for declines (Sala-Llonch et al., 2015).

Some areas of the brain compensate by becoming more active with age. For example, there are increases in prefrontal activity (associated with effortful, controlled tasks) with age (Grady, 2012). This results in a shift toward "semanticized cognition" in older adults. In other words, older adults utilize their vast store of knowledge to strategically bolster their diminishing processing capacities, allowing them to compensate with slower, although often better, decision-making (Spreng & Turner, 2019).

In late adulthood, the brain gradually diminishes in volume and weight, particularly in the frontal and temporal regions (Fjell & Walhovd, 2010; Lockhart & DeCarli, 2014). There is also a decline in the number, or density, of dopamine receptors at a rate of decline of 4 to 14 percent per decade (Karrer et al., 2017). Dopamine receptors are important as they help in regulating attention (Park & Reuter-Lorenz, 2009). The hippocampus—the seat of memory—also shrinks (Raz et al., 2010). Moreover, there is also a reduction in cortical thickness (Lemaitre et al., 2012). When the pace of these brain changes increases, cognitive declines are increasingly likely (Carlson et al., 2008).

Beginning in the midfifties, the myelin sheathing that enables neuronal impulses to travel rapidly between brain regions begins to thin (Natrajan et al., 2015; Hinman & Abraham, 2007). This deterioration of the brain's myelin, or white matter, is associated with cognitive and motor declines (Chapman & Hill, 2020; Bartzokis et al., 2010).

Postmortem examinations of brain tissue have found significant DNA damage in certain genes that affect learning and memory in most very old people and some middle-aged people (Lu et al., 2004). Such changes are associated with neurodegenerative disorders and dementia (Madabhushi et al., 2014). Although adults over the age of 90 years are more than 25 times more likely to develop dementia than adults age 65 to 69 years (Brayne, 2007), such deterioration is not inevitable.

Not all changes in the brain are destructive. Researchers have discovered that older brains can grow new nerve cells from stem cells—something once thought impossible. Evidence of cell division has been found in the hippocampus, a portion of the brain involved in learning and memory (Seib & Martin-Villalba, 2015; Chaker et al., 2016). It appears likely that in humans, physical activity paired with cognitive challenges may be most effective in promoting the growth of new cells (Kempermann, 2015; Di Benedetto et al., 2017). Moreover, those older adults who maintain a sense of purpose later in life retain a larger volume of gray matter in their insular cortex when compared to adults without this orientation (Ryff et al., 2016). Findings such as these highlight the plasticity and possibility for positive change in the aging brain even late in life.

### checkpoint can you...

- Identify several age-related changes in the brain and their effects on cognitive and social functioning?

## SENSORY AND PSYCHOMOTOR FUNCTIONING

Individual differences in sensory and motor functioning increase with age. Some older people experience sharp declines; others find their abilities virtually unchanged. Visual and hearing problems may deprive them of social relationships and independence, and motor impairments may limit everyday activities.

**Vision** Older eyes need more light to see, are more sensitive to glare, and may have trouble locating and reading signs; thus, driving may become hazardous, especially at night (Ortiz-Peregrina et al., 2020). Older adults may have difficulty with depth or color perception or with such daily activities as reading, sewing, shopping, and cooking (Desai et al., 2001). Additionally, losses in visual contrast sensitivity can cause difficulty in reading very small or very light print (Owsley, 2011). Moreover, vision problems also can lead to accidents and falls, in part because vision is associated with balance control (Saftari & Kwon, 2018). Many community-dwelling older adults report difficulty with bathing, dressing, and walking around the house due to visual impairment (Kempen et al., 2012).

People with moderate visual losses often can be helped by corrective lenses or changes in the environment. While only 2.3 percent of US adults from 40 to 49 years of age have a visual impairment, by 80 years old, 50 percent of adults—currently about 1.61 million people—need glasses to see well. Women are about a third more likely to have a visual impairment than men are (Varma et al., 2016). Globally, estimates are that 2.2 billion people have some form of visual impairment (World Health Organization, 2021).

**Cataracts**, cloudy or opaque areas in the lens of the eye, are common in older adults and eventually cause blurred vision. Approximately 26 million Americans are currently affected by cataracts (Wittenborn & Rein, 2014), and worldwide, 94 million people are visually impaired and 20 million are blind because of cataracts (Lee & Afshari, 2017; Pascolini & Mariotti, 2012). Surgery to remove cataracts is one of the most frequent operations among older Americans and is generally quite successful. Cataract surgery is associated with a reduction in mortality risk of up to 60 percent (Tseng et al., 2017; Tseng et al., 2016). Presumably the reduction in mortality risk results from a number of factors tied to vision, such as greater ease and accuracy in taking medications, greater likelihood of staying physically active, and lower accident risk.

The leading cause of visual impairment in older adults is **age-related macular degeneration**. The macula is a small spot in the center of the retina that helps us keep objects directly in our line of sight in sharp focus. In the most common form of macular degeneration, the retinal cells in this area degenerate over time, and the center of the retina gradually loses the ability to sharply distinguish fine details. Activities such as reading and driving become extremely problematic, as the exact area in which a person focuses becomes blurry. In some cases, treatments using antioxidant and zinc supplements and drugs that block the growth of abnormal blood vessels under the retina can prevent further vision loss but cannot reverse loss that has already occurred (Mitchell et al., 2018).

**Glaucoma** is irreversible damage to the optic nerve caused by increased pressure in the eye. Glaucoma can be treated with eye drops, pills, or surgery. Early treatment can lower elevated pressure in the eye and delay the onset of the condition. However, even with



*In age-related macular degeneration, the leading cause of visual impairment in older adults, the center of the retina gradually loses the ability to distinguish details. In these photos, the left is an image as seen by a person with normal vision, and the right is the same image as seen by a person with macular degeneration.*

National Eye Institute/National Institutes of Health

## THE PSYCHOLOGICAL CONSEQUENCES OF HEARING LOSS

Late adulthood often means contemplating and coming to terms with how you've lived your life. As the final stage in Erik Erikson's model of psychosocial development, this stage concerns an individual's conflict between ego integrity and despair (Ornstein & Lewis, 2021). Adults high in ego integrity tend to feel wise and at peace with the choices they've made. However, those who do not develop ego integrity are characterized by disdain, often brought on by issues such as the inability to retire, passing of loved ones, loss of ones' physical or cognitive integrity, and thoughts of mortality. Although this is a psychosocial process, it is not divorced from biological influences. How do the physical changes of aging interact with these processes? Specifically, what is the psychosocial impact of age-related hearing losses on mental health and quality of life?

Presbycusis is a medical term used to describe cochlear degeneration resulting in age-related hearing loss for both ears. It is the most prevalent sensory impairment in those 75 and older, affecting up to 40 percent of the US population (Ciorba et al., 2012). Across the literature, those affected by presbycusis report a range of negative emotions and behavioral reactions. For instance, the inability to communicate effectively reduces social engagement and increases loneliness in older adults (Davis et al., 2016; Gopinath et al., 2012). This can increase feelings of isolation, frustration, anger, anxiety, dependence, and loneliness in those with hearing loss. Furthermore, these

emotions may lead to older adults withdrawing from those around them, bluffing so as not to reveal their condition, and engaging in maladaptive coping processes associated with low self-esteem (Ciorba et al., 2012). The lack of meaningful interactions brought about by this isolation can thus lead to a less ideal resolution of psychosocial stages of development (Erikson, 1982).

The use of hearing aids is associated with both short- and long-term benefits for elderly individuals, including improved quality of life and communication with others (McArdle et al., 2005). This improvement in the social aspects, in turn, leads to improved psychological well-being and reduced anxiety and depression (Ciorba et al., 2012), easing the individuals' despair and reestablishing their ego integrity. Unfortunately, hearing aids can help but are expensive and may magnify background noises as well as the sounds a person wants to hear. Only 1 in 3 adults age 70 or older who would benefit from the use of hearing aids uses them (National Institute on Deafness and Other Communication Disorders, 2021).



How else might hearing loss affect psychosocial development? What other physical changes might impact psychosocial development?

treatment, 10 percent of people who get glaucoma will eventually go blind. In the United States, approximately 120,000 people are blind from glaucoma (Glaucoma Research Foundation, 2017). Worldwide, glaucoma is the leading cause of blindness, and in 2013, approximately 64.3 million people were affected by glaucoma (Tham et al., 2014).

**Hearing** Globally, about 432 million adults have disabling hearing loss—a permanent hearing loss in the better ear of more than 40 decibels. Estimates are that by 2050, this number will increase to over 700 million people (World Health Organization, 2021). In the United States, approximately 37.5 million adults have some form of hearing loss (National Institute on Deafness and Other Communication Disorders, 2021), and an additional 48 million have hearing loss in at least one ear (Centers for Disease Control and Prevention, 2021).

Hearing impairments increase with age. Almost 18 percent of adults age 45 to 64 have trouble hearing. By 65 to 74 years, the proportion of affected adults rises to 31.6 percent, then 47.2 percent for people 75 and older (Centers for Disease Control, 2018). Men are approximately twice as likely to experience a hearing impairment, and White people are more likely to be affected than other ethnicities. Hearing impairment can result in significant psychological consequences (see Research in Action).

**Strength and Balance** Aging results in a variety of changes related to physical abilities, including increases in body fat and declines in muscle strength, aerobic capacity, flexibility, and agility. Generally, the loss of strength is greater for lower than for upper limbs. The average loss in strength for older adults is approximately 1 to 2 percent annually, a rate that likely increases after age 75 in the absence of physical activity. Flexibility also declines, although less so for women than for men. The declines are related to aging as well as to decreases in physical activity (Milanović et al., 2013). Moreover, declines in strength and flexibility are accompanied by increasing difficulties with balance. Some of these declines are the result of peripheral changes in the muscular control and feedback mechanisms for motor control. However, structural brain changes in the prefrontal cortex and basal ganglia also contribute (Seidler et al., 2010).

These physical changes contribute to falls. Falls, the most common cause of fractures, become increasingly common with age and account for 95 percent of hip fractures in the elderly (Centers for Disease Control and Prevention, 2016). At age 65 to 74, the rate of fractures is approximately 9 per 1,000 adults. By 85 years of age and older, the rate of fractures reaches 51 per 1,000 adults (Levant et al., 2015). Many falls are preventable by eliminating hazards commonly found in the home (Table 3). Additionally, some physical changes of age contributing to falls can be reversed or slowed. A review showed that exercise interventions using multiple-component exercises, resistance training, balance training, and endurance training reduced the risk of falls and improved balance, endurance, and elderly people's ease of walking (Cadore et al., 2013).

The World Health Organization (2019) has made the promotion of functional ability a priority, and global fitness trends show increased interest in functional fitness training (Thompson, 2019). **Functional fitness** training refers to exercises or activities that improve daily activity. While it has implications for all ages, it is perhaps most relevant to elderly adults, who may have increasing difficulty in performing the activities of daily living necessary for independence. Levels of functional fitness decline with age in concert with physical activity in a bidirectional fashion (Milanović et al., 2013). In other words, becoming less physically active over time results in declines in functional fitness. Those functional fitness declines then lead to reductions in physical activity as movements become harder to execute.

While intervention programs using resistance training in the elderly have shown that it is possible to increase muscle strength, there is limited data on how simple increases in strength transfer to everyday movements. Research does show that strength training interventions can help active older adults improve balance and mobility (Copeland et al., 2019). However, functional fitness interventions that specifically mimic desired actions show more

#### functional fitness

The ability to perform the physical activities of daily living.

**TABLE 3** Safety Checklist for Preventing Falls in the Home

<b>Stairways, hallways, and pathways</b>	Free of clutter Good lighting, especially at top of stairs Light switches at top and bottom of stairs Tightly fastened handrails on both sides and full length of stairs Carpets firmly attached and not frayed; rough-textured or abrasive strips to secure footing
<b>Bathrooms</b>	Grab bars conveniently located inside and outside of tubs and showers and near toilets Nonskid mats, abrasive strips, or carpet on all surfaces that may get wet Night-lights
<b>Bedrooms</b>	Telephones and night-lights or light switches within easy reach of beds
<b>All living areas</b>	Electrical cords and telephone wires out of walking paths Rugs and carpets well secured to floor No exposed nails or loose threshold trim Furniture and other objects in familiar places and not in the way; rounded or padded table edges Couches and chairs proper height to get into and out of easily

Source: Adapted from National Institute on Aging (1993).

practical success. For example, rather than using a seated leg press, an elderly person might be coached by being asked to sit down and rise from a chair while wearing a weighted vest. A meta-analysis of 13 studies on functional fitness intervention programs showed that such programs were effective in increasing performance in everyday life and that they were more effective than merely focusing on muscle strength (Liu et al., 2014).

Part of the reason for these gains is that the primary factor in older adults is likely to be a training-induced adaptation in the brain's ability to coordinate motor and brain activity (Voss et al., 2010; Barry & Carson, 2004). For example, vacuuming requires muscle strength in the arms and legs, dynamic balance, control of range of motion, gross and fine motor movements, and the coordination of all movements together (Liu et al., 2014). Thus, functional fitness is as much cognitive as it is physical.

A healthy body leads to a healthy mind. Currently, a large literature exists documenting the positive effects of exercise on cognition. Exercise improves cognitive health in chronically ill adults, helps prevent cognitive declines in healthy adults, and appears to do so regardless of when started and what particular type of exercise is done (Northey et al., 2018; Cai et al., 2017; Gomes-Osman et al., 2018; Bherer et al., 2013).

## SLEEP

A common complaint as people age is that a good night's rest can be more difficult to obtain. Older adults spend more time in the lighter stages of sleep, and they tend to awaken more easily and earlier in the morning. To some extent, this is driven by normative changes in circadian (daily) rhythms. In older people, the sleep schedule shifts forward, making an early bedtime and early rising more likely. Sleep also becomes more fragmented, and older adults may wake several times during the night. They are also more likely to snore loudly. This may be a sign of sleep apnea, a dangerous disorder in which breathing stops and starts repeatedly throughout the night. Older adults are also more likely to suffer from restless leg syndrome, as well as the increasing health risks generally associated with age. All these factors can make high-quality sleep challenging (Julia & Kumar, 2018).

Despite these changes, the assumption that sleep problems are normal in old age can be dangerous (Mattis & Sehgal, 2016). Poor sleep quality or chronic insomnia is associated with loneliness and social isolation (Yu et al., 2018)—an association that has been particularly troublesome given the lockdowns and distancing brought about by COVID-19 (Grossman et al., 2021). Sleep problems can also contribute to depression, neurodegenerative disorders such as dementia, and cognitive declines (Baglioni et al., 2011; Miyata et al., 2013). Either too much sleep or too little sleep is associated with an increased risk of mortality (Gangwisch et al., 2008; Chen et al., 2013).

The American College of Physicians (ACP) recommends that the first line of defense against insomnia and sleep disorders is the use of cognitive behavioral therapy (Qaseem et al., 2016). Such therapy may include instructions on, for example, staying in bed only when asleep, getting up at the same time each morning, and learning about false beliefs pertaining to sleep needs. This type of therapy has produced improvements, with or without drug treatment (Lovato et al., 2014; Reynolds et al., 1999). However, if it is not effective, the ACP recommends that short-term use of medications be considered. The most commonly prescribed drugs include benzodiazepines (e.g., Halcion, Ativan), non-benzodiazepine hypnotics (e.g., Ambien), and suvorexant (e.g., Belsomra), a drug that works via altering the signaling of neurotransmitters that regulate sleep.

## SEXUAL FUNCTIONING

Contrary to stereotypes, a sizable number of adults remain sexually active late into adulthood. In a national survey, 38.9 percent of US men and 16.8 percent of women age 75 to 85 reported being sexually active (Lindau & Gavrilova, 2010). Men retain more sexual desire; however, both men and women report a decline in sexual desire with age (Aggarwal, 2013), and women report a greater decline in sexual activity (Lee et al., 2016). Ageism



## checkpoint can you ...

- Describe typical changes in sensory and motor functioning and in sleep needs, and tell how they can affect everyday living?
- Summarize changes in sexual functioning and possibilities for sexual activity in late life?

and stereotypes about the elderly may negatively influence sexual desire (Heywood et al., 2017), although more recent cohorts report a more positive attitude about sexuality in old age, higher satisfaction in their sex lives, less sexual dysfunction, and higher rates of sexual activity than previous cohorts (DeLamater, 2012). Still, the majority of older adults report having less sex than they would like to have (Lindau et al., 2018).

Sex is different in late adulthood from what it was earlier. Men typically take longer to develop an erection and to ejaculate, may need more manual stimulation, may experience longer intervals between erections, or may have difficulty achieving an erection. Women report more difficulties with becoming aroused and experiencing orgasm, breast engorgement and other signs of sexual arousal are less intense than before, and they may experience issues with lubrication (Lee et al., 2016; Lindau et al., 2007). Health problems are more likely to affect the sex life of women than men, but poor mental health and relationship dissatisfaction are associated with sexual dysfunction in both men and women (Laumann et al., 2008). The most consistent predictors of whether or not an older adult is having sex are health status and the presence of a relationship partner (Schick et al., 2010; DeLamater, 2012).

Physicians should avoid prescribing drugs that interfere with sexual functioning if alternatives are available and, when such a drug must be taken, should alert the patient to its effects. Because sexually active older adults rarely use condoms (Schick et al., 2010), sexual health and the transmission of sexually transmitted infections should be discussed with them. This is a particularly important conversation for those older adults with dementia, who are less likely to bring up sexual issues to health care providers (Lindau et al., 2018).

Sexual activity in older people is normal and healthy. Thus, housing arrangements and care providers should consider the sexual needs of elderly people. Satisfaction with life, cognitive functioning, and psychological well-being are all strongly related to interest in and having sex (Smith et al., 2019; Trudel et al., 2008).

## Physical and Mental Health

Increasing life expectancy is raising pressing questions about the relationship between longevity and health, both physical and mental. How healthy are older adults today, and how can they stave off declines in health?

### HEALTH STATUS

Poor health is not an inevitable consequence of aging. About 78 percent of US adults age 65 and older consider themselves in good to excellent health (Federal Interagency Forum on Aging-Related Statistics, 2020). As earlier in life, poverty is strongly related to poor health and to limited access to and use of health care (National Center for Health Statistics, 2018). For instance, poverty is related to a higher incidence of arthritis, diabetes, high blood pressure, heart disease, depression, and stroke in the elderly (Menec et al., 2010). Adults who live in poverty are less likely to engage in such healthy behaviors as leisure-time physical activity, avoidance of smoking, and maintenance of appropriate body weight (Schoenborn & Heyman, 2009).

Estimates are that approximately 163,000 American COVID-19 deaths could have been prevented by vaccination in the period from June 2021 to November 2021 (Ortaliza et al., 2021).



**COVID-19 Risk and Age** As the COVID-19 pandemic progressed, it became increasingly clear that older people were at higher risk of serious complications, hospitalizations, and death than younger people, with the greatest risk occurring for those adults over 85 years of age (CDC COVID-19 Response Team, 2020). The presence of comorbid chronic health conditions, most commonly high blood pressure, obesity, and diabetes, significantly elevated risk as well (Richardson et al., 2020). In 2020, COVID-19 was the third leading cause of death in the United States (Murphy et al., 2021), and the pandemic was expected to continue to exert effects.

There has been controversy about how best to count the death toll in the wake of the pandemic. When people become ill and die from COVID-19 infection, their deaths may be either the direct result of the virus or due to complications associated with preexisting chronic diseases. Additionally, any people who died from COVID-19 but were not tested for its presence might not have been included in the official count. Last, because of infection concerns, many people were not visiting doctors or hospitals when they previously would have. Thus, the effects of avoiding preventative health care are also an indirect influence on overall death rates, even though they are not directly tied to COVID-19 infections.

In March 2022, global deaths resulting directly from COVID-19 infection were estimated to be 6.14 million, and American deaths surpassed 1 million (Worldometer, 2020). However, the true cost is much higher. A better way to estimate the death toll is the excess death rate—a comparison of expected deaths to actual deaths regardless of the cause of death. In other words, by comparing how many people have usually died at a particular time of year to how many people actually died, we can get a more accurate representation of how COVID-19 has affected mortality. When viewed in this way, it is clear that COVID-19 is resulting in much higher death tolls in places in which the virus has spread (Centers for Disease Control and Prevention, 2022). Although models vary, the true cost of COVID is between 2 to 4 times higher (Adam, 2022).



Although controversial, some data suggests evoking stereotypes of the elderly leads to slower walking in young people (Bargh et al., 1996).

## CHRONIC CONDITIONS AND DISABILITIES

More than 2 out of 3 Americans have multiple chronic conditions. People with chronic health conditions are likely to have a lower quality of life and are at risk of disability and death (Gill & Moore, 2013).

**Common Chronic Conditions** In 2018, the six leading causes of death for people age 65 years and over in the United States—heart disease, cancer, chronic lower respiratory disease, stroke, Alzheimer’s disease, and diabetes—were chronic conditions (Federal Interagency Forum on Aging-Related Statistics, 2020). More than two-thirds of health care costs involve the management of chronic disease (Gill & Moore, 2013). Worldwide, in 2019 the leading causes of death at age 50 to 69 and older were cardiovascular diseases, cancers, respiratory diseases, digestive diseases, liver disease, diabetes, kidney disease, and tuberculosis. By 70 years and older, dementia becomes the fourth leading cause of death (Ritchie & Roser, 2022). These statistics do not include the influence of COVID-19, and preliminary global data suggests COVID-19 will be categorized as at least the fourth-leading cause of death in 2020 (Troeger, 2021).

Many of these deaths could be prevented through healthier lifestyles. If Americans were to quit smoking, eat a healthier diet, and engage in higher levels of physical activity, estimates are that approximately 35 percent of preventable deaths could be avoided in the elderly (Centers for Disease Control & Merck Co. Foundation, 2007). Unfortunately, the prevalence of chronic health conditions has increased in people 65 years and older, and the majority of older adults have multiple chronic conditions (Federal Interagency Forum on Aging-Related Statistics, 2020).

Approximately 25 percent of men and 19 percent of women report being diagnosed with diabetes in the United States. Hypertension affects about 58 percent of men and 56 percent of women. Hypertension, which can affect blood flow to the brain, is related to declines in attention, learning, memory, executive functions, psychomotor abilities, and visual, perceptual, and spatial skills, and is a risk factor for stroke. Table 4 lists warning signs for stroke. Aside from hypertension and diabetes, the most common chronic conditions are arthritis (46 percent of men and 54 percent of women), heart disease (35 percent of men and 24 percent of women), and cancer (27 percent of men and 25 percent of women) (Federal Interagency Forum on Aging-Related Statistics, 2020).

Chronic conditions also vary by race/ethnicity. In some cases, BIPOC are at higher risk. For example, in 2018, 68.1 percent of older Blacks and 60 percent of older Hispanics had hypertension compared with 55 percent of older Whites. Older Blacks (33.5 percent)

Can you sit cross-legged on the ground and, without using your hands to support yourself, get up off the ground? This is known as the sitting-rising test, and in older adults, the ability to do so is associated with decreased mortality risk (de Brito et al., 2014).



**TABLE 4** Warning Signs of Stroke

The first letters of four warning signs of stroke spell the word **FAST**.

**Face** Drooping—Does one side of the face droop or is it numb? Ask the person to smile to see if the person's smile is uneven.

**Arm** Weakness—Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?

**Speech** Difficulty—Is speech slurred? Ask the person to repeat a simple sentence.

**Time** to call 911—if someone shows any of these symptoms, call 911 and get the person to the hospital immediately.

Source: American Heart Association, 2013.

and Hispanics (32.7 percent) were also significantly more likely than older Whites (18.2 percent) to have diabetes. However, older White adults are more likely to suffer from cancer, arthritis, and heart disease than are BIPOC older adults (Federal Interagency Forum on Aging-Related Statistics, 2020).

**Disabilities and Functional Limitations** With age, the presence of disabilities—including limitations in vision, hearing, mobility, cognition and self-care—increases. Approximately 16 percent of people age 65 to 74 report some form of disability. This number rises sharply with age, with 24.7 percent of adults age 75 to 84 and 45.9 percent of adults over 85 years old reporting a disability. The most common disability involves mobility issues (16 percent), most commonly with walking or climbing stairs, followed by hearing issues (5 percent), cognitive problems (4 percent), and difficulties with vision and self-care (3 percent each) (Federal Interagency Forum on Aging-Related Statistics, 2020).

Disabilities are also more common in particular groups. Women (24 percent) are more likely to report disabilities than are men (20 percent). Moreover, although men report more severe hearing disabilities, women are more likely to report higher levels of disability for visual and mobility problems. Race and ethnicity also matter, with White older adults (21 percent) less likely to report disabilities than African American (29 percent) and Hispanic (27 percent) older adults (Federal Interagency Forum on Aging-Related Statistics, 2020).

In the presence of chronic conditions and loss of reserve capacity, even a minor illness or injury can have serious repercussions. In one study looking at older adults hospitalized after a fall, those adults were more likely to die or be placed in a nursing home than adults admitted to the hospital for reasons unrelated to a fall (Aitken et al., 2010).

**Periodontal Disease** Periodontal disease is a chronic inflammation of the gums caused by the bacteria in plaque. It can result in tender or bleeding gums and eventual tooth loss. Rates of periodontal disease increase with age, peaking at 40 years, and then remain relatively stable in old age. Globally, periodontal disease is more common in high- than in middle- or low-income countries, possibly because adults in higher-income countries make up a larger proportion of the population. However, within an individual country, those adults of low socioeconomic status are more likely to suffer from periodontitis (Nazir et al., 2020).

Although more aging Americans are keeping their natural teeth than ever before, 15 percent of adults age 65 to 74, 22 percent of adults age 75 to 84, and 31 percent of adults age 85 and older had no natural teeth (Federal Interagency Forum on Aging-Related Statistics, 2020). Those older adults with fewer than 20 natural teeth may suffer from malnutrition as a result of the increased difficulty in adequately chewing food (Hassan et al., 2017). Periodontal disease has also been related to cognitive declines and cardiovascular disease (Kaye et al., 2010; Blaizot et al., 2009), and it may impair the regulation of blood sugar as well (Zadik et al., 2010).

## checkpoint can you ...

- Summarize the health status of older adults, and identify chronic conditions common in late life?

## LIFESTYLE INFLUENCES ON HEALTH AND LONGEVITY

The chances of remaining healthy and fit in late life often depend on lifestyle choices, especially related to smoking, heavy drinking, and exercise.

**Physical Activity** A lifelong program of exercise may prevent many physical changes once incorrectly believed to be part of normal aging. Regular exercise can strengthen the heart and lungs and decrease stress. It can protect against hypertension, hardening of the arteries, heart disease, osteoporosis, and diabetes. It helps maintain speed, stamina, strength, and endurance. It reduces the chance of injuries by making joints and muscles stronger and more flexible, and it helps prevent or relieve lower-back pain and symptoms of arthritis. It can enable people with such conditions as lung disease and arthritis to remain independent and can help prevent the development of limitations on mobility. In addition, it may improve mental alertness and cognitive performance, help relieve anxiety and mild depression, and enhance feelings of mastery and well-being (Bauman et al., 2016; Wilson et al., 2016; Stubbs et al., 2017; Colberg et al., 2016; Cartee et al., 2016).

Inactivity, by contrast, contributes to heart disease, diabetes, colon cancer, and high blood pressure. It may contribute to obesity, which affects the circulatory system, the kidneys, and sugar metabolism; contributes to degenerative disorders; and tends to shorten life. Unfortunately, many older adults do not do enough. Current recommendations call for a minimum of 150 minutes of moderate aerobic activity over the course of a week, or slightly more than 20 minutes a day. Additional exercise is ideal, but anything is better than nothing (Centers for Disease Control and Prevention, 2018). Almost 28 percent of adults 50 years and older without a chronic disease are physically inactive. Moreover, adults who have at least one chronic disease are 40 percent less likely to be physically active (Watson et al., 2016).

**Nutrition** Almost 80 percent of Americans age 71 and older fail to meet the criteria for a healthy diet, most notably by eating too many empty calories (Krebs-Smith et al., 2010). For example, a mere 12.3 percent of adults meet fruit intake guidelines, and only 10 percent do so for vegetables (Lee et al., 2022). Generally, older women (when compared to older men) and people of higher economic status consume a healthier diet. (Ervin, 2008; Wang et al., 2014). In addition to food choice, issues such as difficulties with chewing foods and problems with swallowing can also negatively impact nutrition in the elderly (Rusu et al., 2020).

Nutrition plays a large part in susceptibility to such chronic illnesses as atherosclerosis, heart disease, and diabetes as well as functional and activity limitations. Excessive body fat, particularly from a diet heavy in red and processed meats and alcohol, has been linked to several types of cancer (World Cancer Research Fund, 2007). However, while weight gain is not healthy for older adults, neither is excessive weight loss. Excessive weight loss can lead to muscle weakness and general frailty, and it can be as debilitating to older adults as weight gain (Schlenker, 2010).

A healthy diet can reduce risks of obesity as well as of high blood pressure and cholesterol (Federal Interagency Forum on Aging-Related Statistics, 2020). A diet high in olive oil, whole grains, vegetables, and nuts has been found to reduce cardiovascular risk (Esposito et al., 2004) and—in combination with physical activity, moderate alcohol use, and refraining from smoking—cut 10-year mortality from all causes in healthy 70- to 90-year-old Europeans by nearly two-thirds (Rosamond et al., 2008). Eating fruits and vegetables—especially those rich in vitamin C such as citrus fruits and juices, green leafy vegetables, broccoli, cabbage, cauliflower, and brussels sprouts—lowers the risk of cancer and heart disease (Takachi et al., 2007). Overall, a healthy diet is associated with a higher quality of life in older adults (Govindaraju et al., 2018).

## MENTAL AND BEHAVIORAL PROBLEMS

Over 20 percent of adults aged 60 years and older suffer from a mental or neurological disorder, and almost 7 percent of disability worldwide can be attributed to such a



*Exercise is likely to help this woman lead a longer, healthier life.*

Thomas Barwick/Stone/Getty Images



*Do you engage regularly in physical exercise? How many of the older people you know do so? What types of physical activity do you expect to maintain as you get older?*

### checkpoint can you...

- Give evidence of the influences of exercise and nutrition on health and longevity?

*Pet therapy results in decreased depressive symptoms and improvements in cognitive functioning for the elderly (Moretti et al., 2010).*



disorder (World Health Organization, 2018). In the United States, 6.3 percent of Americans 75 years and older report frequent mental distress (Centers for Disease Control and Prevention, 2013). Although most older adults do not report mental illness, mental and behavioral disturbances that do occur can result in functional impairment in major life activities as well as cognitive declines.

**Depression** Depression affect about 5 percent of adults, and is a leading cause of disability. Rates are higher in older populations, with approximately 7 percent of the global older adult population reporting depression (World Health Organization, 2021). In the United States, 10 percent of men and 17 percent of women age 55 to 64 reported depression (Federal Interagency Forum on Aging-Related Statistics, 2020). The COVID-19 pandemic resulted in somewhat higher rates of depression in the elderly but less so than in other age groups (Czeisler et al., 2020).

Heredity has been estimated to account for 37 percent of the risk for major depression; however, genetic influences seem to be more important in women than in men (Mullins & Lewis, 2017; Kendler et al., 2006). Vulnerability seems to result from the influence of multiple genes interacting with environmental factors. For instance, one consistently identified risk factor for depression in adulthood, more than doubling the risk, is childhood abuse or neglect (Mandelli et al., 2015). Special risk factors in late adulthood include chronic illness or disability, cognitive decline, and divorce, separation, or widowhood (Harvard Medical School, 2003; Mueller et al., 2004). In men, low social support, most commonly the result of living alone and having a small social circle, is strongly related to depression risk (Sonnenberg et al., 2013). Depression plays a more pervasive role in mental functional status, disability, and quality of life than do physical ailments such as diabetes or arthritis (Noël et al., 2004).

More than 75 percent of depressed people in low- to middle-income families are not able to access any treatment. Reasons for the lack of access include a lack of medical and health care resources, poverty, incorrect diagnosis, and social stigma associated with mental disorders (World Health Organization, 2021). When there is health care access, depression can be treated by antidepressant drugs, psychotherapy, or both, and antidepressant drugs appear to work equally as well as they do at younger ages (Blazer, 2009). Regular exercise can also reduce symptoms of mild to moderate depression (Stanton & Reaburn, 2014; Dunn et al., 2005), although this may not be true or practical for very frail older adults (Underwood et al., 2013).

**Dementia** Sixty-nine-year-old Rose has become increasingly forgetful. Although her memory for long-ago events is sharp and detailed, she often repeats herself or finds herself standing in her kitchen, unsure of why she walked in. Always responsible in the past, she now has multiple unpaid bills and got lost driving home from the store in the past week. It is likely that Rose is experiencing the effects of dementia.

**Dementia** is the general term for physiologically caused cognitive and behavioral decline sufficient to interfere with daily activities. Cognitive decline becomes increasingly common with advanced age, affecting 9 percent of American men and 10 percent of women age 75 to 84, and 23 percent of men and 24 percent of women 85 and older (Federal Interagency Forum on Aging-Related Statistics, 2020). Worldwide, there are approximately 55 million people with dementia, and approximately 10 million new cases are diagnosed every year, 60 percent of whom hail from low- or middle-income countries (World Health Organization, 2021). Although there are about 50 causes of dementia of known origin, the vast majority of cases (about two-thirds) are caused by **Alzheimer's disease**, a progressive, degenerative brain disorder (Hamza et al., 2011).

**Parkinson's disease**, the second most common disorder involving progressive neurological degeneration, is characterized by tremor, stiffness, slowed movement, and unstable posture. Although estimates vary widely, at 60 years of age, slightly less than half of 1 percent of people are affected. By 80, the proportion of affected people rises to slightly under 2 percent, with the proportion of affected men rising with increasing age (Pringsheim et al., 2014).

#### dementia

Deterioration in cognitive and behavioral functioning due to physiological causes.

#### Alzheimer's disease

Progressive, irreversible, degenerative brain disorder characterized by cognitive deterioration and loss of control of bodily functions, leading to death.

#### Parkinson's disease

Progressive, irreversible degenerative neurological disorder, characterized by tremor, stiffness, slowed movement, and unstable posture.

Another condition leading to cognitive difficulties is multi-infarct dementia (MD). MD is the result of a series of small strokes resulting in lesions in both white and gray matter in the brain. MD often leads to difficulties with attention, memory, abnormalities in emotional expression, and difficulty walking (McKay & Counts, 2017). MD likely coexists with Alzheimer's disease in many older adults; 25 to 80 percent of adults diagnosed with Alzheimer's disease also show evidence of lesions (Jellinger, 2013).

*Because our pet population is living longer too, dementia also occurs in dogs and is known as canine cognitive dysfunction syndrome. Common signs include accidents in the house, wandering in circles or staring, and changes in appetite and circadian rhythms.*



## checkpoint can you . . .

- Tell why late-life depression may be more common than is generally realized?
- Name the three main causes of dementia in older adults?

**Alzheimer's Disease** Alzheimer's disease (AD) is one of the most common and most feared terminal illnesses among aging persons. It gradually robs patients of intelligence, awareness, and even the ability to control their bodily functions—and finally kills them. The disease affected more than 50 million people in 2018, and that number is expected to more than triple to 152 million by 2050 (Patterson, 2018).

Alzheimer's is the sixth-leading cause of the death in the United States, and an estimated 5.8 million people are living with AD, approximately 200,000 of whom are under 65 and may have an early-onset form of the disease. Almost two-thirds of affected individuals are women. Older African Americans have about double the risk and Hispanics have about 1½ times the risk for AD or other cognitive impairments as do non-Hispanic White adults (Alzheimer's Association, 2019).

**Symptoms** The classic symptoms of Alzheimer's disease are memory impairment, deterioration of language, and deficits in visual and spatial processing. The most prominent early symptom is inability to recall recent events or take in new information. A person may repeat questions that were just answered or leave an everyday task unfinished. These early signs may be overlooked because they look like forgetfulness or are interpreted as signs of normal aging.

Personality changes—for instance, rigidity, apathy, egocentricity, and impaired emotional control—tend to occur early in the disease's development (Balsis et al., 2005). There are indications that these personality changes may be useful in predicting which adults might be at risk of developing dementia (Pocnet et al., 2013). More symptoms follow: irritability, anxiety, depression, and, later, delusions, delirium, and wandering. Long-term memory, judgment, concentration, orientation, and speech all become impaired, and patients have trouble handling basic activities of daily life. By the end, the patient cannot use language, does not recognize family members, cannot eat without help, cannot control the bowels, and loses the ability to walk (Alzheimer's Association, 2021). Table 5 compares early warning signs of Alzheimer's disease with normal mental lapses.

**TABLE 5** Alzheimer's Disease versus Normal Behavior

Symptoms of Disease	Normal Behavior
Permanently forgetting recent events; asking the same questions repeatedly	Temporarily forgetting things
Inability to do routine tasks with many steps such as making and serving a meal	Inability to do some challenging tasks
Forgetting simple words	Forgetting unusual or complex words
Getting lost on one's own block	Getting lost in a strange city
Forgetting what the numbers in a checkbook mean and what to do with them	Making mistakes in balancing a checkbook
Putting things in inappropriate places (e.g., a wristwatch in a fishbowl)	Misplacing everyday items
Rapid, dramatic mood swings and personality changes	Occasional mood changes

#### **neurofibrillary tangles**

Twisted masses of protein fibers found in brains of persons with Alzheimer's disease.

#### **amyloid plaque**

Waxy chunks of insoluble tissue found in brains of persons with Alzheimer's disease.

**Causes and Risk Factors** Accumulation of an abnormal protein called beta amyloid peptide appears to be the main culprit contributing to the development of Alzheimer's disease (Sadigh-Eteghad et al., 2015; Selkoe & Hardy, 2016). The brain of a person with AD contains excessive amounts of **neurofibrillary tangles** (twisted masses of dead neurons) and large waxy clumps of **amyloid plaque** (nonfunctioning tissue formed by beta amyloid in the spaces between neurons). Because these plaques are insoluble, the brain cannot clear them away. They may become dense, spread, and destroy surrounding neurons, block cell-to-cell signaling, or trigger inflammatory responses.

There is evidence that another mechanism driving the progression of neurodegenerative disease is the breakdown of myelin, the fatty substance that coats axons and allows neural impulses to travel more rapidly. Myelin affords our brains some of their great complexity, but it also makes us vulnerable to neurodegenerative disease in old age, particularly in late developing areas of the brain (Bartzokis et al., 2007; Wang et al., 2018). In this theory, neurodegenerative disease results from the brain's efforts to repair broken-down myelin, which result in the release of neurofibrillary tangles and amyloid plaques. These substances can damage neurons directly as described above, but the brain is also affected by the compromised myelin (Papuc & Rejdak, 2018; Amlien & Fjell, 2014). When attempts to restore myelin are successful, disease progression is slow. However, when this process fails, neurodegenerative disease progresses (Bartzokis, 2011).

Alzheimer's disease is influenced by genetics. Some rare variants caused by dominant mutations and occurring less than 1 percent of the time are associated with early-onset dementia (Hsu et al., 2018). However, the majority of dementia cases involve multifactorial effects, where any one of a number of genetic variants may put people at elevated risk. The more variants a person has and the more environmental risk factors they accumulate over the course of a lifetime, the higher the chance of developing AD. Epigenetic modifications that determine whether a particular gene is turned on are important (Lord & Cruchaga, 2014). Thus far, the genes that have been identified are thought to explain no more than half of all AD cases. Moreover, new genes are continually being identified (Lambert et al., 2013). A recent meta-analysis of over 450,000 people identified 29 new risk genetic loci that were more common in people with AD (Jansen et al., 2019).

Although a National Institutes of Health Consensus Development statement (Davilglus et al., 2010) stated that no firm conclusions could be drawn about lifestyle modifications that might decrease risk for AD, a recent report by the Alzheimer's Association (Baumgart et al., 2015) argued there is enough evidence to provide general guidelines. Estimates are that 35 percent of dementia cases could be prevented by modifying a series of risk factors including education, hearing loss, obesity and hypertension, depression, smoking, physical inactivity, diabetes, and social isolation (Yaffe, 2018).

Foods rich in vitamin E, vitamin B-12, omega-3 fatty acids, and unhydrogenated unsaturated fats—such as nuts, seeds, fish, and eggs—may be protective against AD, whereas foods high in saturated and transunsaturated fats, such as red meats, butter, and ice cream, may be harmful. Low levels of vitamin D are also associated with dementia (Cao et al., 2016; Barnard et al., 2014; Morris, 2004). A lack of regular physical activity also puts people at risk for later dementia (Baumgart et al., 2015), and instituting an exercise program even late in life may help reverse some of the early signs of cognitive impairment in otherwise healthy adults (Lautenschlager et al., 2008). Smokers have increased risk of AD (Saito et al., 2017; Durazzo et al., 2014). Additionally, depression, high blood pressure, obesity, and physical inactivity also increase risk (Deckers et al., 2015; Bellou et al., 2017). Nonsteroidal anti-inflammatory drugs such as aspirin and ibuprofen were originally thought to cut the risk of AD (Vlad et al., 2008); however, randomized controlled studies have not found an association (Wang et al., 2015).

Education and cognitively stimulating activities have been associated with reduced risk of the disorder (Sattler et al., 2012; Xu et al., 2016) as has a challenging job (Smart et al., 2014), and bilingualism, even in those who are illiterate (Alladi et al., 2013). Essentially, an active mind stays healthy longer. The protective effect may be due not to education itself but rather to the fact that educated people tend to be cognitively active (Wilson & Bennet, 2003). Cognitive activity may build **cognitive reserve** and thus delay

#### **cognitive reserve**

Hypothesized fund of energy that may enable a deteriorating brain to continue to function normally.

the onset of dementia (Stern, 2012). Cognitive reserve, like organ reserve, may enable a deteriorating brain to continue to function under stress, up to a point, without showing signs of impairment.

*Diagnosis and Prediction* AD is generally diagnosed via medical assessment. A medical history of the patient is taken, including a mental status exam, a physical and neurological exam, and possibly blood and imaging tests, in order to rule out alternative explanations (Alzheimer's Association, 2020).

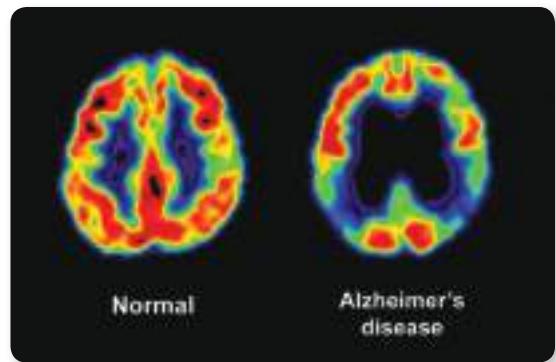
Neuroimaging is becoming an increasingly useful tool and shows great promise for future diagnostic purposes. The identification of AD prior to symptom onset has a variety of important applications, from assessing those individuals at risk of developing dementia to monitoring interventions and drug treatments to allowing people time to plan for their future. A number of medical and governmental organizations have published guidelines about the use of and applications for imaging techniques in diagnosis and study. While all agree that currently, brain imaging is not sufficient for diagnosis, it holds great promise (Moyer, 2014; Johnson et al., 2013; Filippi et al., 2012). A particularly promising avenue involves the use of machine learning methods. Currently, computer-assisted algorithms have become proficient at distinguishing healthy brains from those suffering the effects of dementia but are not yet able to differentiate between different types of dementia (Ahmed et al., 2019; Pellegrini et al., 2018).

Another diagnostic approach has focused on finding biomarkers—a measurable indicator of a biological process—in order to diagnose early manifestations of the disease. Currently, three biomarkers have been strongly associated with dementia risk: tau proteins, amyloid plaques, and neurofilament light chains (NFLs). Tau proteins help deliver materials to neurons; however, in AD, they become twisted into neurofibrillary tangles. Amyloid is a protein found throughout the body that in AD results in plaques of sticky buildup. NFL is a protein released when myelin is tangled. Researchers have used technology to detect all three substances in the blood, cerebral fluid, and spinal fluid of people with AD (Qu et al., 2021; Olsson et al., 2016). Importantly, biomarker tests also show promise for ruling out AD in people showing impairment (Molinuevo et al., 2014).

Despite the identification of several genes associated with AD (Kim et al., 2014), genetic testing so far has a limited role in prediction and diagnosis. Still, it may be useful in combination with cognitive tests, brain scans, and clinical evidence of symptoms. There is evidence that people alter their health behaviors if told they have genes making them vulnerable to dementia (Chao et al., 2008), so such information may someday become part of the way in which the medical profession addresses risk in individuals. Genetic profiles may also offer a means by which to predict which drugs might be most effective in different individuals (Roses et al., 2014).

*Treatment* Although no cure has yet been found, early diagnosis and treatment can slow the progress of Alzheimer's disease and improve quality of life. Currently, none of the five drugs approved by the US Food and Drug Administration slows or stops the progression of Alzheimer's disease. However, four have a beneficial effect on cognitive processes by temporarily increasing the levels of available neurotransmitters in the brain. Memantine (commercially known as Namenda) works by blocking the excess stimulation of receptors, thereby limiting damage to nerve cells (Alzheimer's Association, 2020). The use of memantine is well tolerated and has been shown to improve cognition and behavior and allow people to more effectively carry out activities of daily living, although the overall effect is small (Kishi et al., 2017; Matsunaga et al., 2015).

In the absence of a cure, management of the disease is critical. Recent meta-analyses have shown that while cognitive interventions do sometimes result in small cognitive gains, the benefits are not usually clinically significant and there are few improvements



(left) These positron emission tomography (PET) scans show significant decrease of glucose cerebral metabolism and reduced activity (right) in a patient with Alzheimer's disease, compared to the greater activity levels seen in a normal brain. Science Source



Although cognitive interventions can result in small cognitive gains, there are few improvements in everyday functioning. However, medications can be used to manage behaviors and improve quality of life.

Xurxo Lobato/Cover/Getty Images

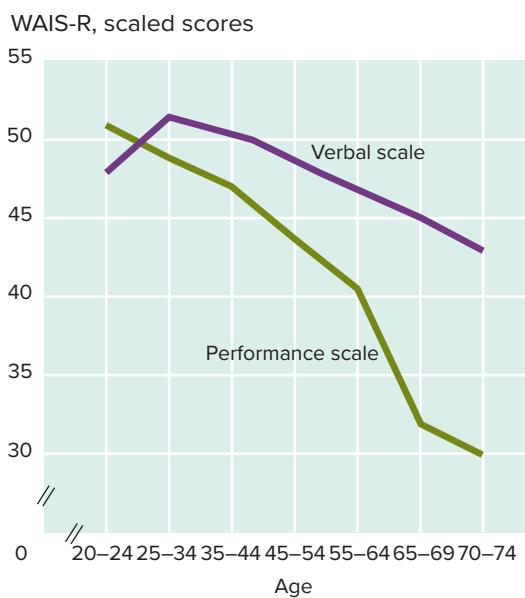
- Summarize what is known about the prevalence, symptoms, causes, risk factors, diagnosis, and treatment of Alzheimer's disease?

in everyday functioning (Kallio et al., 2017; Huntley et al., 2015). Moreover, while cognitive training improves performance in healthy older adults, there is little evidence that it delays cognitive declines or dementia (Butler et al., 2018).

However, behavioral symptoms can be managed. Behavioral therapies can slow deterioration, improve communication, and reduce disruptive behavior. Drugs can relieve agitation, lighten depression, and help patients sleep. Proper nourishment and fluid intake together with exercise, physical therapy, and control of other medical conditions are important, and cooperation between the physician and the caregiver is essential (Alzheimer's Association, 2020).

# COGNITIVE DEVELOPMENT

The effects of aging aren't all bad. As we get older, we are more likely to attend to and process positive, happy faces than negative ones, a tendency that may have implications for how we handle real-life problems (Mather & Carstenson, 2003).



**FIGURE 4**

Classic Aging Pattern on the Revised Version of the Wechsler Adult Intelligence Scale (WAIS-R)

Scores on the performance subtests decline far more rapidly with age than scores on the verbal subtests.

Source: Botwinick (1984).

## Cognitive Changes

Old age "adds as it takes away," wrote the poet William Carlos Williams in one of three books of verse he produced between his first stroke at the age of 68 and his death at 79. As Baltes's life-span developmental approach suggests, age brings gains as well as losses. Let's look first at intelligence and general processing abilities, then at memory, and then at wisdom, which is popularly associated with the later years.

### INTELLIGENCE AND PROCESSING ABILITIES

Does intelligence diminish in late adulthood? The answer depends on what abilities are being measured, and how. Some abilities, such as speed of mental processes and abstract reasoning, may decline in later years, but other abilities tend to improve throughout most of adult life.

**The Wechsler Adult Intelligence Scale** To measure the intelligence of older adults, researchers often use the **Wechsler Adult Intelligence Scale (WAIS)**. The WAIS is a standardized measure that allows assessment of a person's intellectual functioning at different ages. Scores on the WAIS subtests yield a verbal IQ, a performance IQ, and a total IQ. Older adults tend not to perform as well as younger adults on the WAIS, but the difference is primarily in processing speed and nonverbal performance. On the five subtests in the performance scale (such as identifying the missing part of a picture or mastering a maze), scores drop with age, but on the six tests making up the verbal scale—particularly tests of vocabulary, information, and comprehension—scores fall only slightly (Figure 4). This is called the classic aging pattern (Botwinick, 1984). This age disparity in performance, particularly for processing speed, is smaller in more recent cohorts (Miller et al., 2009) and does not appear to differ between men and women (Saggino et al., 2014). Variability in scores—meaning some people score higher than others—increases with age and particularly in those areas in which average declines are more apparent (Wisdom et al., 2012).

This pattern is likely a consequence of muscular and neurological slowing. For tasks that do not require speed, declines are less likely. For example, verbal items that hold up with age are based on knowledge and do not require the test-taker to figure out or do anything new. The performance tasks involve the processing of new information and require perceptual speed and motor skills.

**The Seattle Longitudinal Study** In some ways, the mind can be thought of as a muscle. It too responds to use, and it too declines if

not engaged in the world around us. This “use it or lose it” dynamic is illustrated with research from the Seattle Longitudinal Study of Adult Intelligence. Researchers measured six primary mental abilities: verbal meaning, word fluency, number (computational ability), spatial orientation, inductive reasoning, and perceptual speed. Consistent with other studies, perceptual speed tended to decline earliest and most rapidly. Cognitive decline in other respects was slower and more variable. Very few people weakened in all abilities, and many improved in some areas. Most fairly healthy older adults showed only small losses until the late sixties or seventies. Not until the eighties did they fall below the average performance of younger adults, and even then declines in verbal abilities and reasoning were modest (Schaie & Willis, 2010; Schaie, 2005).

The most striking feature of the Seattle findings was the tremendous variation among individuals. Some participants showed declines during their forties, but a few maintained full functioning very late in life. Those most likely to show declines were men who had low educational levels, were dissatisfied with their success in life, and exhibited a significant decrease in flexibility of personality. Some health-related variables also were important, most notably, hypertension and diabetes. Participants who engaged in cognitively complex work and who were in good health tended to retain their abilities longer. Engaging in activities that challenge cognitive skills promotes the retention or growth of those skills and, as we mentioned earlier, appears to protect against dementia (Schaie & Willis, 2010; Willis & Schaie, 2005; Lindwall et al., 2012).

Cognitive deterioration, then, often may be related to disuse. Much as many aging athletes can call on physical reserves, older people who get training, practice, and social support seem to be able to draw on mental reserves.

**Changes in Processing Abilities** In many older adults, a general slowdown in central nervous system functioning is a major contributor to losses of efficiency of information processing and changes in cognitive abilities. Speed of processing, one of the first abilities to decline, is related to health status, balance, and gait and to performance of activities of daily living, such as looking up phone numbers and counting out change (Bezdicek et al., 2016).

Additionally, older adults also tend to have more difficulty with switching attention from one task to another (Bucur & Madden, 2010). These findings may help explain why many older adults have difficulty driving, which requires rapid attentional shifts and processing (Duley & Adams, 2013; Bialystok et al., 2004). Training can improve older adults’ performance. Participation in such programs has been shown to extend the period of time before older adults are forced to stop driving, to allow them to more effectively and independently complete activities of daily living to a later age, and to reduce symptoms of depression (Edwards et al., 2009; Wolinsky et al., 2015).

Although age-related declines in processing abilities occur, it is not inevitable that older adults will show declines in everyday life. Many older adults naturally compensate. For example, they use their vast reservoirs of knowledge to compensate for declines that do occur (Peters et al., 2007). Generally, older adults tend to do better on tasks that depend on ingrained habits and knowledge (Bialystok et al., 2004). It is likely that older adults are using alternative, although complementary, neural circuits for more difficult tasks. In support of this, imaging research shows differences in how older adults process information relative to younger adults. In particular, decreases in processing speed are associated with decreased specialization in areas of the brain—a process known as dedifferentiation (Park & McDonough, 2013). It may be that cognitive interventions are exerting their influence by restructuring the pathways used to complete difficult tasks (Park & Reuter-Lorenz, 2009).

**Everyday Problem Solving** The purpose of intelligence, of course, is not to take tests but to deal with the challenges of daily life. In many studies, the quality of practical decisions (such as what car to buy or how to compare insurance policies) bore only a modest

#### Wechsler Adult Intelligence Scale (WAIS)

Intelligence test for adults that yields verbal and performance scores as well as a combined score.



Older people  
daydream less than  
younger people (Jordão et  
al., 2019).

## checkpoint can you ...

- Compare the classic aging pattern on the WAIS with those of the Seattle Longitudinal Study with regard to cognitive changes in old age?
- Cite evidence of the plasticity of cognitive abilities in late adulthood?
- Discuss the relationship between practical (everyday) problem solving and age?

relationship, if any, to performance on tasks like those on intelligence tests (Blanchard-Fields, 2007) and, often, no relationship to age (Meyer et al., 1995). Similarly, much research on everyday problem solving (such as what to do about a flooded basement) has not found as early a decline as is often seen in measures of fluid intelligence, and some research has found marked improvement (Blancher-Fields et al., 2004; Mienaltowski, 2011), particularly when the contexts being assessed are those that older people are familiar with (Aristico et al., 2010).

Age differences are reduced in studies that focus on interpersonal problems—such as how to deal with a new mother who insists on showing her older mother-in-law how to hold the baby—rather than on instrumental problems—such as how to return defective merchandise (Thornton & Dumke, 2005). Older adults have more extensive repertoires of strategies to apply to interpersonal situations than younger adults do, they tend to minimize tension and disagreement and emphasize positive emotions, they are more likely to choose a highly effective strategy than are younger adults, and they are more likely to use their past successes or failures when asked to make a choice about something (Blanchard-Fields et al., 2007; Fingerman & Charles, 2010; Worthy & Maddox, 2012).

**Cognitive Functioning and Mortality Risk** Psychometric intelligence may be a predictor of how long and in what condition adults will live. For instance, longitudinal studies have shown people who scored high in intelligence as children were less likely to suffer from poor health or have chronic health conditions at age 50 (Wraw et al., 2015) and that high intelligence in childhood was associated with a lower risk of mortality at age 79 (Čukić et al., 2017). Cognitive performance is also linked to physical health in adulthood. For example, physically frail older adults are at higher risk for cognitive impairment (Robertson et al., 2013), and people who have been critically ill often show cognitive impairments for up to a year after they recover (Pandharipande et al., 2013). Moreover, the inability to complete activities of daily living is associated with more rapid cognitive declines (Gerstorf et al., 2013).

Some researchers argue the link between intelligence and mortality is an artifact of methodological confounds in research. For example, studies that include childhood adversity within the models are less likely to find a link between intelligence and mortality (Kilgour et al., 2010). Socioeconomic status may also matter. Some studies have found that childhood SES does not seem to attenuate the link between intelligence and health (Der et al., 2009). However, when adult SES is included in models, the strength of the relationship between health and intelligence is lessened (Calvin et al., 2010). Yet another interpretation is that, as many diseases such as diabetes and hypertension may lead both to cognitive declines earlier in life and an earlier death, data showing a link between the two may reflect the action of the disease instead of an association between IQ and mortality (Batty et al., 2007).

## MEMORY

Failing memory is often considered a sign of aging. Loss of memory is the chief worry reported by older Americans (National Council on Aging, 2015). Moreover, 53 percent of adults without dementia age 40 to 79 years report experiencing memory concerns (Luck et al., 2018), and slightly under 19 percent of adults age 65 and older have cognitive impairment without dementia (Langa et al., 2017).

**Short-Term Memory** Researchers assess short-term memory by asking a person to repeat a sequence of numbers, either in the order in which they were presented (digit span forward) or in reverse order (digit span backward). Digit span forward ability holds up well with advancing age, but digit span backward performance does not (Craik & Jennings, 1992; Lovelace, 1990). Why? One reason may involve the differentiation of sensory and working memory. **Sensory memory** involves the brief storage of sensory information. For example, when you see the trail left behind by a fourth of July sparkler,

### sensory memory

Initial, brief, temporary storage of sensory information.

you are seeing the trace left by your sensory memory. **Working memory** involves the short-term storage of information being actively processed, such as when you calculate the tip on a restaurant bill in your head. Some theorists argue that forward repetition requires only sensory memory, which retains efficiency throughout life. However, backward repetition requires the manipulation of information in working memory, which gradually shrinks in capacity with age (Hale et al., 2011).

A key factor in memory performance is the complexity of the task (Park & Reuter-Lorenz, 2009). Tasks that require only rehearsal, or repetition, show very little decline. Tasks that require reorganization or elaboration show greater falloff (Emery et al., 2008). If you are asked to verbally rearrange a series of items (such as “Band-Aid, elephant, newspaper”) in order of increasing size (“Band-Aid, newspaper, elephant”), you must call to mind your previous knowledge of Band-Aids, newspapers, and elephants (Cherry & Park, 1993). More mental effort is needed to keep this additional information in mind, using more of the limited capacity of working memory.

**Long-Term Memory** Information-processing researchers divide long-term memory into three major systems: episodic memory, semantic memory, and procedural memory.

Do you remember what you had for breakfast this morning? Such information is stored in **episodic memory**, the long-term memory system most likely to deteriorate with age (Tromp et al., 2015). Episodic memory is linked to specific events; you retrieve an item by reconstructing the original experience in your mind. Older adults are less able than younger people to do so, perhaps because they focus less on context (where something happened, who was there), and rely more on gist than details (Dodson & Schacter, 2002). Because of this, they have fewer connections to jog their memory (Lovelace, 1990). Also, older people have had many similar experiences that tend to run together. When older people perceive an event as distinctive, they can remember it nearly as well as younger people (Geraci et al., 2009). Declines in episodic memory can be predicted on the basis of declines in working memory, perhaps because it becomes more difficult for older adults to integrate new information with existing memory structures (Memel et al., 2019).

Some types of long-term memories remain vigorous as people age. **Semantic memory** consists of meanings, facts, and concepts accumulated over a lifetime of learning. Semantic memory shows little decline with age, although infrequently used or highly specific information may sometimes be difficult to retrieve (Luo & Craik, 2008). Indeed, some aspects of semantic memory, such as vocabulary and knowledge of rules of language, may even increase with age (Camp, 1989).

Another long-term memory system that remains relatively unaffected is procedural memory. **Procedural memory** includes motor skills (like riding a bike) and habits (like taking a particular street home) that, once learned, take little conscious effort. If you have ever intended to stop by the grocery store on your way home and ended up pulling into your driveway instead without thinking about it, you have experienced the automaticity that is characteristic of procedural memory. It is relatively unaffected by age (Fleischman et al., 2004; Lezak et al., 2012). Moreover, new procedural memories that are formed in old age may be retained for at least 2 years (Smith et al., 2005), even though they may take a bit more time to learn initially (Iaria et al., 2009).

**The Effect of Aging on Speech** As people become older, they often begin to have minor difficulties with language. However, these experiences are not generally due to issues related to language per se but rather are the result of problems accessing and retrieving information from memory. The core language processes remain relatively unchanged across age (Shafto & Tyler, 2014). Thus, they are considered memory problems rather than language problems.

For example, have you ever been unable to come up with a word that you knew perfectly well? This is known as the tip-of-the-tongue (TOT)

#### working memory

Short-term storage of information being actively processed.

#### episodic memory

Long-term memory of specific experiences or events, linked to time and place.

#### semantic memory

Long-term memory of general factual knowledge, social customs, and language.

#### procedural memory

Long-term memory of motor skills, habits, and ways of doing things, which can be recalled without conscious effort; sometimes called *implicit memory*.



Riding a bicycle requires procedural memory. Once learned, procedural skills can be activated without conscious effort, even after a long period of disuse.  
IndianFaces/Shutterstock

phenomenon; it occurs in people of all ages but becomes more common in late adulthood (Abrams & Davis, 2016). Presumably, the TOT phenomenon results from a failure in working memory (Schwartz, 2008) and is not a consequence of older adults having a larger vocabulary and thus more interference when searching for words (Shafto et al., 2017). Other problems in verbal retrieval include errors in naming pictures of objects aloud, more ambiguous references and slips of the tongue in everyday speech, more use of nonfluencies (such as “um” and “er”) in speech, and a tendency to misspell words (such as *indict*) that are spelled differently than they sound (Burke & Shafto, 2004). Older adults also may show declines in the complexity of grammar used in speech (Kemper et al., 2001).

**Correlates of Memory System Declines** What explains older adults’ memory losses? Investigators have offered several hypotheses. One approach focuses on the biological structures that make memory work. Another approach looks at problems with the three steps required to process information in memory: encoding, storage, and retrieval.

Memory can be improved with a simple technique: saying words out loud, even if you just mouth the words (McLeod et al., 2010).

As an example of one frequent consequence in the real world, medically fragile adults are more likely to have problems with memory and thus are less likely to take their medications (Insel et al., 2006).



**Neurological Change** Different memory systems depend on different brain structures. Thus, a disorder that damages a particular brain structure may impair the type of memory associated with it. For example, Alzheimer’s disease disrupts working memory (located in the prefrontal cortex at the front of the frontal lobes) as well as semantic and episodic memory (located in the frontal and temporal lobes); Parkinson’s disease affects procedural memory, located in the cerebellum, basal ganglia, and other areas (Budson & Price, 2005).

The main structures involved in normal memory processing and storage include the frontal lobes and the hippocampus. The frontal lobes are active in both encoding and retrieval of episodic memories. Dysfunction in these areas may cause false memories—“remembering” events that never occurred. Specifically, changes in the prefrontal cortex and medial temporal lobes seem to be most responsible (Devitt & Schacter, 2016).

The hippocampus, a small, centrally located structure deep in the temporal lobe, seems critical to the ability to store new information in episodic memory and is broadly important for memory processes. Research with adults in their seventies and older has shown that better memory is associated with larger hippocampal volume. For example, adults who were 75 years of age and older who perform well on memory tests have larger hippocampal volume (Dekhtyar et al., 2017; O’Shea et al., 2016).

**Problems in Encoding, Storage, and Retrieval** Episodic memory is particularly vulnerable to the effects of aging, an effect that is aggravated as memory tasks become more complex or demanding (Cansino, 2009). Older adults seem to have more difficulty *encoding* new episodic memories, presumably because of difficulties in forming and later recalling a coherent and cohesive episode. Because of more limited processing resources, they tend to be less efficient and precise than younger adults in the use of strategies to make it easier to remember; for example, by arranging material alphabetically or creating mental associations (Craik et al., 2012). Most studies have found that older and younger adults are about equally knowledgeable as to effective encoding strategies (Salthouse, 1991). Some research has found that training older adults in memory strategies results in fewer age-related declines and that the larger the number of strategies taught, the larger the effect on memory (Gross et al., 2012; Naveh-Benjamin et al., 2007). However, other researchers have argued that the memory gains are limited, do not generalize to tasks other than those participants are trained in, and do not result in improvements in general memory performance (Belander et al., 2017).

Another hypothesis is that material in storage may deteriorate to the point where retrieval becomes difficult or impossible. Some research suggests that a small increase in “storage failure” may occur with age (Lustig & Flegal, 2008). However, traces of decayed memories are likely to remain, and it may be possible to reconstruct them or at least to relearn the material speedily (Camp & McKittrick, 1989; Chafetz, 1992). In particular, it appears as if memories that contain an emotional component are more resistant to the effects of decay (Kensinger, 2009). For example, studies have found that older adults are motivated to preserve memories that have positive emotional meaning to them (Reed et al., 2014; Carstensen & Mikels, 2005). Thus, emotional factors need to be considered in studying memory changes in old age.

We should keep in mind that most of the research on encoding, storage, and retrieval has been done in the laboratory and that results may not transfer to the real world (Kempe et al., 2015). For example, in daily diary studies, older adults were more likely to report memory failures on days when they experienced stress, suggesting stress is relevant (Neupert et al., 2006). As another example, memory failures of older adults in daily life often include prospective memory failures. Prospective memory involves remembering to do something in the future, such as remembering to call a friend later. Prospective memory declines with age and is a significant issue for many older adults. However, the research in this area is incomplete and does not illuminate the central processes that govern failure (Kliegel et al., 2016).

## WISDOM

Wisdom has been defined as “exceptional breadth and depth of knowledge about the conditions of life and human affairs and reflective judgment about the application of this knowledge. It may involve insight and awareness of the uncertain, paradoxical nature of reality and may lead to transcendence, detachment from preoccupation with the self” (Kramer, 2003, p. 132). Quite simply, wisdom is the ability to navigate the messiness of life. It involves understanding how people work and how to accomplish goals. People who are wise, according to psychologists, are also comfortable with uncertainty and understand that different people have different viewpoints and that sometimes there is no one right answer.

The most extensive research on wisdom as a cognitive ability has been done by the late Paul Baltes and his colleagues. In a series of studies, they asked adults of various ages and occupations to think aloud about hypothetical dilemmas. Responses were rated according to whether they showed rich factual and procedural knowledge about the human condition and about dealing with life’s problems. Other criteria were awareness that contextual circumstances can influence problems, that problems tend to lend themselves to multiple interpretations and solutions, and that choices of solutions depend on individual values, goals, and priorities (Baltes & Staudinger, 2000; Pasupathi et al., 2001).

Wisdom is not necessarily a property of old age—or of any age. Instead, it appears to be a rather rare and complex phenomenon that shows relative stability or slight growth in certain individuals (Staudinger & Baltes, 1996; Staudinger et al., 1992). A variety of factors, including personality, life experience, and self-reflective tendencies (Westrate & Glück, 2017; Wink & Staudinger, 2016; Sheldock & Cornelius, 2003), affect the propensity to be wise. Culture is also an influence. For example, whereas age and wisdom are associated in American samples, in Japanese samples, younger- and middle-age adults reason as wisely as older adults (Grossman et al., 2012).

Research on physical functioning, cognition, and aging is more encouraging than some might expect. Older adults tend to make the most of their abilities, often exploiting gains in one area to offset declines in another. Research highlights the widely varying paths of physical and cognitive development among individuals. It also points to the importance of emotional well-being in late adulthood.

## checkpoint can you...

- Identify two aspects of memory that tend to decline with age and give reasons for this decline?
- Discuss neurological changes related to memory?
- Explain how problems in encoding, storage, and retrieval may affect memory in late adulthood, and discuss how emotional factors may affect memory?



*Wisdom and spirituality are not the same thing; spiritual adults are not wiser, and wise adults are not more likely to be religious. However, both spirituality and wisdom are related to well-being and having a purpose in life (Ardelt & Wingard, 2018).*



*Think of the wisest person you know. Which, if any, of the criteria for wisdom mentioned in this chapter seem to describe this person? If none does, how would you define and measure wisdom?*

## checkpoint can you...

- Compare various approaches to the study of wisdom?
- Discuss findings from Baltes’s studies of wisdom?

# summary and key terms

## Old Age Today

- Efforts to combat ageism are making headway, thanks to the visibility of a growing number of active, healthy older adults.
- The proportion of older people in the United States and world populations is greater than ever before and is expected to continue to grow. People over 80 are the fastest-growing age group.
- Although effects of primary aging may be beyond people's control, they often can avoid effects of secondary aging.
- Specialists in the study of aging sometimes refer to people between ages 65 and 74 as the *young old*, those over 75 as the *old old*, and those over 85 as the *oldest old*. However, these terms may be more useful when used to refer to functional age.

**ageism** (493)

**primary aging** (495)

**secondary aging** (495)

**activities of daily living (ADLs)** (496)

**functional age** (496)

**gerontology** (496)

**geriatrics** (496)

- Research on extension of the life span through genetic manipulation or caloric restriction has challenged the idea of a biological limit to the life span.

**life expectancy** (496)

**longevity** (496)

**life span** (496)

**senescence** (498)

**genetic-programming theories** (498)

**Hayflick limit** (499)

**variable-rate theories** (500)

**free radicals** (500)

**survival curve** (500)

**morbidity** (501)

## Physical Changes

- Changes in body systems and organs are highly variable. Most body systems continue to function fairly well with age, but reserve capacity declines.
- Although the brain changes with age, the changes are usually modest. They include loss of volume and weight and a slowing of responses. However, the brain can grow new neurons, change the way it processes information, and build new connections late in life.
- Vision and hearing problems may interfere with daily life but often can be corrected. Irreversible damage may result from age-related macular degeneration or glaucoma. Losses in taste and smell may lead to poor nutrition. Training can improve muscular strength, balance, and reaction time. Older adults tend to be susceptible to accidents and falls.
- Older people tend to sleep less and dream less than before, but chronic insomnia can be an indication of depression.
- Many older adults remain sexually active.

**reserve capacity** (502)

**cataracts** (504)

**age-related macular degeneration** (504)

**glaucoma** (504)

**functional fitness** (506)

## PHYSICAL DEVELOPMENT

### Longevity and Aging

- Life expectancy has increased dramatically. The longer people live, the longer they are likely to live.
- In general, life expectancy is greater in developed countries than in developing countries, among Hispanics and White Americans than among African Americans, and among women as compared to men.
- Recent gains in life expectancy come largely from progress toward reducing death rates from diseases affecting older people. Further improvements in life expectancy may depend on whether scientists can learn to modify basic processes of aging.
- Theories of biological aging fall into two categories: genetic-programming theories and variable-rate, or error, theories.

## Physical and Mental Health

- Most older people are reasonably healthy, especially if they follow a healthy lifestyle. Many do have chronic conditions, but these usually do not greatly limit activities or interfere with daily life.
- Exercise and diet are important influences on health. Loss of teeth can seriously affect nutrition.
- Most older people are in good mental health. Depression and many other conditions can be reversed with treatment; a few, such as Alzheimer's disease, are irreversible.
- Alzheimer's disease becomes more prevalent with age. It is highly heritable, but diet, exercise, and other lifestyle factors may play a part. Cognitive activity may be protective by building up a cognitive reserve that enables the brain to function under stress. Behavioral and drug treatments can slow deterioration. Mild cognitive impairment can be an early sign of the disease, and researchers are developing tools for early diagnosis.

**dementia** (512)

**Alzheimer's disease** (512)

**Parkinson's disease** (512)

**neurofibrillary tangles** (514)

**amyloid plaque** (514)

**cognitive reserve** (514)

## COGNITIVE DEVELOPMENT

### Aspects of Cognitive Development

- Older adults do better on the verbal portion of the Wechsler Adult Intelligence Scale than on the performance portion.
- The Seattle Longitudinal Study found that cognitive functioning in late adulthood is highly variable. Few people decline in all or most areas, and many people improve in some. The engagement hypothesis seeks to explain these differences.
- Older adults are more effective in solving practical problems that have emotional relevance for them.
- A general slowdown in central nervous system functioning may affect the speed of information processing.
- Intelligence may be a predictor of longevity.
- Sensory memory, semantic memory, and procedural memory appear nearly as efficient in older adults as in younger adults. The capacity of working memory and episodic memory are often less efficient.
- Older adults have more problems with oral word retrieval and spelling than younger adults. Grammatical complexity and content of speech decline with age.
- Neurological changes and problems in encoding, storage, and retrieval may account for much of the decline in memory functioning in older adults. However, the brain can compensate for some age-related declines.
- According to Baltes's studies, wisdom is not age-related.

**Wechsler Adult Intelligence Scale (WAIS)** (517)

**sensory memory** (518)

**working memory** (519)

**episodic memory** (519)

**semantic memory** (519)

**procedural memory** (519)

chapter

# 18

## outline

- Personality Development in Late Adulthood
- Well-Being in Late Adulthood
- Practical and Social Issues Related to Aging
- Personal Relationships in Late Life
- Marital and Long-Term Relationships
- Nonmarital Lifestyles and Relationships
- Nonmarital Kinship Ties

## learning objectives

- Discuss theories and research on personality changes in late adulthood.
- Identify strategies and resources that contribute to older adults' well-being and mental health.
- Discuss aging and adaptation to work and retirement.
- Characterize the social relationships of aging adults.

# Psychosocial Development in Late Adulthood



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## did you know?

- Productive activity seems to play an important part in successful aging.
- In most developed countries, older women are more likely to live alone than older men.
- People who can confide their feelings and thoughts to friends tend to deal better with the changes and challenges of aging.

*In this chapter, we look at theory and research on psychosocial development in late adulthood and discuss late-life options for work, retirement, and living arrangements and their impact on society's ability to support and care for an aging population. Finally, we look at relationships with families and friends, which greatly affect the quality of these last years.*



**I** am still every age that I have been.  
—Madeleine L'Engle (1918–2007)

# Personality Development in Late Adulthood

Most theorists view late adulthood as a developmental stage with its own special issues and tasks. It is a time when people can reexamine their lives, complete unfinished business, and decide how best to channel their energies and spend their remaining days, months, or years. In this section, we discuss how older adults cope with stress and loss, and what constitutes successful aging.

## EGO INTEGRITY VERSUS DESPAIR

For Erikson, the crowning achievement of late adulthood is a sense of ego integrity, or integrity of the self. In the eighth and final stage of the life span, **ego integrity versus despair**, older adults need to evaluate and accept their lives so as to accept death. Building on the outcomes of the seven previous stages, they struggle to achieve a sense of coherence and wholeness, rather than give way to despair over their inability to relive the past differently (Erikson et al., 1986). People who succeed in this final, integrative task gain a sense of the meaning of their lives within the larger social order. The virtue that may develop during this stage is wisdom. Wisdom, said Erikson, means accepting the life one has lived, without major regrets, without dwelling on “might-have-beens.” It means accepting imperfection in the self, in parents, in children, and in life.

Although integrity must outweigh despair if this stage is to be resolved successfully, Erikson maintained that some despair is inevitable. People need to mourn—not only for their own misfortunes and lost chances but for the vulnerability and transience of the human condition.

## PERSONALITY TRAITS IN OLD AGE

Does personality change in late life? The answer may depend in part on the way stability and change are measured.

**Personality Stability and Change in Late Adulthood** For the most part, personality stability follows an inverted U-shaped curve. Stability is lowest in adolescence, peaks in midadulthood, peaking at about age 60, and then declines once again in later adulthood (Bleindorn et al., 2021). Change is possible at any point in the life span, and most of the personality changes seen in adult-

When does "old age" begin?  
That depends on who you ask.  
People who are under the age of  
30 are pretty sure it begins  
sometime before you turn 60 years  
old. However, the older you get,  
the later you think old age begins:  
At 75 years of age, only 35  
percent of people consider  
themselves old (Pew Research  
Center, 2009).



### ego integrity versus despair

According to Erikson, the eighth and final stage of psychosocial development, in which people in late adulthood either achieve a sense of integrity of the self by accepting the lives they have lived, and thus accept death, or yield to despair that their lives cannot be relived.



Dr. Anthony Fauci, an American physician-scientist and immunologist, has said he believes he has a personal responsibility to make a positive impact on society. This suggests he will be in a good position to achieve ego integrity.

Bao Dandan/Xinhua/Alamy Stock Photo

hood are in the direction of increased stability, adaptability, and adjustment (Damian et al., 2019).

Longitudinal and cross-sectional studies have found continued change in late adulthood. Research has found neuroticism, openness to experience, and extraversion decline while agreeableness and conscientiousness increase over the course of the life span (Leszko et al., 2016). For the most part, cross-cultural data mirror these findings, with declines in neuroticism and extraversion and increases in agreeableness and conscientiousness reported across multiple cultures (Costa et al., 2019).

Why do people show normative changes in personality characteristics? Some researchers argue that these processes are driven primarily by intrinsic genetic differences between people that unfold over time. Other researchers argue that life experiences—getting married, joining the workforce, and so on—are the primary drivers of personality change. Still others argue explicitly for a consideration both of genetic and environmental influences (Costa et al., 2019).

Newer, finer-grained analysis suggests that personality change consists of both stability and change and different patterns of change in different individuals, perhaps helping explain the diversity of findings in the literature (Leszko et al., 2016). For instance, there are individual differences in personality stability, peaking at midlife (Schwaba & Bleidorn, 2018). And, although personality is a largely stable trait across the life span, there is also partial support for a U-shaped trend in stability with increasing instability later in life. Moreover, some traits, such as extraversion, are relatively stable. Others, such as agreeableness, are more likely to change in response to temporary events (Wagner et al., 2019).

*One life experience that might be predicted to affect personality is retirement. After retiring, adults in one study showed sudden increases in openness and agreeableness, as well as more gradual increases in emotional stability (Schwaba & Bleidorn, 2019).*

*People high in neuroticism and conscientiousness were more likely to socially distance during the COVID-19 pandemic (Abdelrahman, 2020).*

**The Influence of Personality on Health and Well-Being** Personality is a strong predictor of health and well-being—stronger in most respects than social relationships and health (Isaacowitz & Smith, 2003). A recent meta-synthesis (a secondary meta-analysis of 36 meta-analyses) of more than 500,000 participants examined the influence of the Big Five traits on mental health, physical health, and health-related behaviors. As a whole, there was a strong link between personality and mental health, a moderate link between personality and health-related behaviors, and a weak link between personality and physical health. Moreover, when the personality traits were examined independently, agreeableness, conscientiousness, and neuroticism were stronger predictors than were extraversion and openness to experience (Strickhouser et al., 2017).

Personality traits influence behavior, and behavior influences health. For example, neuroticism has been a consistently identified risk factor for poor physical and psychological health (Friedman, 2019). Highly neurotic people have low survival rates, possibly because they are likely to smoke or use alcohol or drugs to help calm their negative emotions and because they are ineffective in managing stress (Mroczek & Spiro, 2007). By contrast, conscientiousness might predict health and mortality because conscientious people tend to avoid risky behaviors and to engage in activities that promote their health, such as regular visits to the doctor or the gym (Friedman & Kern, 2014). The riskiest combination appears to be when individuals are both high in neuroticism as well as low in conscientiousness, as both these patterns are associated with a higher risk of inflammatory responses in the body (Sutin et al., 2010).

The realization that personality change can also be predictive moved research away from a primary focus on the static examination of personality to the exploration of how dynamic changes might impact health indices (Leszko et al.,



*Neuroticism is a risk factor for poor physical and psychological health.*

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2016). For example, people who remain stable on openness to experience and neuroticism enjoy better reasoning abilities and faster reaction time than those individuals whose levels change (Graham & Lachman, 2012). Additionally, instability in these areas, specifically when neuroticism increases and openness to experience declines, is associated with deterioration in cognitive processing and greater difficulty with activities of daily living (Pocnet et al., 2013).

Some changes are beneficial. For instance, increases in agreeableness, conscientiousness, and extraversion are associated with improved physical and mental health (Magee et al., 2013; Turiano et al., 2011) and social well-being (Hill et al., 2012). Moreover, effects appear to be interactive. For example, in one 4-year longitudinal study of over 16,000 Australian adults, agreeableness, conscientiousness, and extraversion predicted well-being. Those adults who were high in well-being then became even more agreeable, conscientious, and extraverted over time. Thus, both personality and well-being exerted reciprocal influences on each other (Soto, 2015). This reciprocal effect between personality and aspects of mental health and well-being exists in both a positive and negative direction: A similar dynamic has been found with personality change and depressive symptoms (Hakulinen et al., 2015).

## checkpoint can you . . .

- Discuss Erikson's stage of ego integrity versus despair, and tell what Erikson meant by wisdom?
- Summarize research about personality traits and stability and their effects on physical and mental health and well-being?

## Well-Being in Late Adulthood

In general, older adults have fewer mental disorders and are happier and more satisfied with life than younger adults (Yang, 2008). Happiness tends to be high in early adulthood, declines until people reach 50 years of age, and then tends to rise again until 85 years of age—at that point reaching levels even higher than in the teenage years (Stone et al., 2010). Once people reach older adulthood, the prevalence of psychiatric disorders tends to decrease through the later decades of life, and gender differences tend to even out (Reynolds et al., 2015).

The U-shaped pattern of well-being does not appear to be a universal feature of human psychology. For example, within the United States, Black and Latino adults report lower well-being than do White adults (Barger et al., 2009). Cross-cultural data also show variations. In sub-Saharan African, well-being is generally low and remains so over time. In Eastern European countries, well-being is moderate and then falls steeply in old age, a pattern that is reproduced in Latin America and the Caribbean to a lesser degree (Steptoe et al., 2015). This is not purely a matter of economics. Although overall well-being is associated with socioeconomic level, other variables may impact this relationship. For example, one study of 34 countries showed a per capita increase in the gross domestic product was not associated with increases in well-being when it was also accompanied by an increase in income inequality (Oishi & Kesebir, 2015).

An alternative explanation for the increase in happiness later in life focuses on survival curves. In this view, the rise in happiness seen in American adults later in life may reflect the selective survival of happier people, especially after the age of 70 (Segerstrom et al., 2016). Still, some cohort variations and social disparities exist. For example, baby boomers report lower levels of happiness than do earlier and later cohorts, perhaps due to the immense size of their generation and the resulting competitive strains for schooling, jobs, and economic security, as well as the turbulent societal events of their formative years (Yang, 2008).

Another explanation for this generally positive picture comes from socioemotional selectivity theory: As people get older, they tend to seek out activities and people that give them emotional gratification (English & Carstensen, 2014). Older adults are also better at regulating their emotions; thus, they tend to be happier and more cheerful than younger adults and to experience negative emotions less often and more fleetingly (Urry & Gross, 2010; Jacques et al., 2009). Additionally, older adults also show a bias in their information processing known as the positivity effect. Older adults are more likely to pay attention to, and then remember, positive events than negative events (Reed et al., 2014).

In some adults, there is a sharp and rapid decline in well-being and life satisfaction approximately 3 to 5 years before death known as a “terminal drop” (Cohen-Mansfield et al., 2018). Events more common in the last years of life—the loss of a spouse, increasing mobility limitations, deteriorating health, or the knowledge that the end of life is drawing near—may lead to the declines.

## WELL-BEING IN SEXUAL MINORITIES

Those adults who are members of any marginalized group are subject to increased stressors that exert a negative effect on health and well-being. Thus, it is not surprising to find that this is true of LGBTQ+ adults. Moreover, for aging gays and lesbians who recognized their sexual orientation before the rise of the gay liberation movement, their self-concept tended to be shaped by the then-prevailing stigma and bigotry leveled against sexual minorities. Many older LGBTQ+ adults must deal not only with the stigma of being a sexual minority member but also with stigma leveled against the elderly (Van Wagenen et al., 2013).

Sexual-minority adults report higher rates of depression and are more likely to smoke and drink excessively than heterosexual adults (Rice et al., 2019). Moreover, a full 82 percent of LGBTQ+ adults report being victimized at least once because of their sexual orientation or gender identity, and 64 percent report being victimized 3 or more times. Approximately 9 percent are HIV positive, and more than half of Americans now living with HIV disease are 50 years or older (Fredericksen-Goldsen et al., 2011). Moreover, few services exist targeting LGBTQ+ seniors, often leaving them without an adequate safety net (Abatiell & Adams, 2011). Many have been denied appropriate health care, and more than 20 percent do not disclose their sexual orientation to their health care providers (Fredericksen-Goldsen et al., 2011).

Although all LGBTQ+ adults are at higher risk than the general population, transgender adults appear to be at even higher risk. When compared to gay, lesbian, and bisexual adults, transgender adults are more likely to suffer from poor physical health, depression, and high stress. They are also likely to report fear of accessing health care services, internalized stigma, and a lack of social support (Frederiksens-Goldsen et al., 2014).

However, not all the news is bad. Most LGBTQ+ adults are able to show resilience, and only a minority report failing to cope in a meaningful way (Van Wagenen et al., 2013). Ninety-one percent participate in wellness activities and 82 percent exercise. Moreover, approximately 90 percent report belonging to and feeling good about their community and report adequate social support. As discussed next, religion can also provide protection against life’s stressors, and 38 percent of LGBTQ+ adults report participating in religious or spiritual activities (Fredericksen-Goldsen et al., 2011).

## THE EFFECT OF RELIGION AND SPIRITUALITY ON WELL-BEING

In a survey of 106 countries worldwide, younger adults were less likely to say that religion was very important to them in 46 of the countries. In only 2 of the 106 countries were older adults less religious than younger adults (Pew Research Center, 2018). In the United States, 38 percent of millennials (born between 1990 and 1996) say religion is very important in their lives. However, 59 percent of baby boomers (born from 1946 to 1964) say the same, and for those over the age of 72, the number rises to 67 percent (Pew Research Center, 2015).

Many studies suggest a positive link between religion or spirituality and health and mortality. Overall, those people who identify with a religion and who attend services at least once a month are more likely to describe themselves as “very happy” than those people who are not actively religious (Marshall, 2019). Other research has found positive associations between religiosity or spirituality and measures of health, well-being, marital satisfaction, and psychological functioning, and negative associations with depression, suicide, delinquency, criminality, and drug and alcohol use (Koenig, 2012;

Seybold & Hill, 2001; Bjørkløf et al., 2013; Green & Elliott, 2010).

An important factor may be the social support provided by church membership and the religious community (Taylor et al., 2017). It appears this support is related to a reduced risk of depression (Chatters et al., 2015). In one national study of over 2,000 Asian Americans, church attendance was associated with a decreased risk of depression. However, this relationship was mediated by social support. In other words, the social support provided by attending church, rather than church attendance per se, was the crucial factor in risk reduction (Ai et al., 2013).

For racial and ethnic minorities, who must deal with the continuing influence of racism and discrimination, religion may play an even more important role in their efforts to cope than it does for White Americans (Tabak & Mickelson, 2009). For example, older Mexican Americans who attend church once a week have a 32 percent lower mortality risk than those who never attend (Hill et al., 2005). Religion is also closely related to life satisfaction and well-being in elderly Black people (Park et al., 2018; Krause, 2004). One factor is the belief held by many Black people that the church helps sustain them in confronting racial injustice (Ellison et al., 2017; Ellison et al., 2008).

Another reason for the positive links between health and spirituality is because people who belong to a church are more likely to engage in healthy behaviors (Lawler-Row & Elliot, 2009). Research has shown that this is true with Black adults and that religious beliefs are associated with greater fruit and vegetable consumption, reductions in alcohol consumption, and increases in physical activity (Holt et al., 2014; Debnam et al., 2012). This is true not just within churchgoers in the United States but globally as well. For example, in one international study, actively religious people were less likely to smoke in 17 of 19 countries surveyed, and in 11 of the 19 countries, they were less likely to drink several times a week (Marshall, 2019).



*Religious activity seems to help many people cope with stress and loss in later life.*

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#### coping

Adaptive thinking or behavior aimed at reducing or relieving stress that arises from harmful, threatening, or challenging conditions.

#### cognitive-appraisal model

Model of coping, proposed by Lazarus and Folkman, that holds that, on the basis of continuous appraisal of their relationship with the environment, people choose appropriate coping strategies to deal with situations that tax their normal resources.



"*Elderspeak*"—the use of words or phrases with older adults such as "How are we feeling?" or "good girl"—is often used in an attempt to be helpful or kindly, but it is more likely to be viewed as demeaning or condescending (Balsis & Carpenter, 2006).

## COPING AND MENTAL HEALTH

**Coping** is adaptive thinking or behavior aimed at reducing or relieving stress that arises from harmful, threatening, or challenging conditions. In this section, we examine some models of coping.

**Cognitive-Appraisal Model** In the **cognitive-appraisal model** (Lazarus & Folkman, 1984), people respond to stressful or challenging situations on the basis of two types of analyses. In primary appraisal, people analyze a situation and decide, at some level, whether or not the situation is a threat to their well-being. In secondary appraisal, people evaluate what can be done to prevent harm and choose a coping strategy to handle the situation. Coping includes anything an individual thinks or does in trying to adapt to stress, regardless of how well it works.

**Problem-Focused versus Emotion-Focused Coping Strategies** **Problem-focused coping** involves the use of instrumental, or action-oriented, strategies to eliminate, manage, or improve a stressful condition. For example, some students may feel they are capable of learning the relevant material and will do well on an upcoming exam. To achieve this, they may use such problem-focused coping strategies as going to the professor for extra help or spending more time studying. By addressing the source of stress, people using problem-focused coping seek to lessen any harm to the self.

#### problem-focused coping

In the cognitive-appraisal model, coping strategy directed toward eliminating, managing, or improving a stressful situation.

### emotion-focused coping

In the cognitive-appraisal model, coping strategy directed toward managing the emotional response to a stressful situation so as to lessen its physical or psychological impact.

**Emotion-focused coping**, by contrast, involves attempting to manage the emotional response to a stressful situation to relieve its physical or psychological impact. People are more likely to use this coping strategy when they conclude that little or nothing can be done about the situation itself. Thus, they direct their energy toward “feeling better” rather than toward any actions meant to change the situation. For example, when faced with a difficult test, students who feel they are unable to learn the material well enough to earn a good grade may select coping strategies that focus on emotions rather than actions. They might ignore the upcoming test and go out with friends instead of studying, decide the class is not important after all, or become angry with the professor for being unfair.

Which type of coping do you tend to use more: problem-focused or emotion-focused? Which type do your parents use more? Your grandparents? In what kinds of situations does each type of coping seem most effective?



### checkpoint can you ...

- Describe the cognitive-appraisal model of coping, and explain the relationship between age and choice of coping strategies?
- Discuss how religiosity and spirituality relate to mortality risk, health, and well-being in late life?

### checkpoint can you ...

- Discuss what is meant by successful aging?

### disengagement theory

Theory of aging that holds that successful aging is characterized by mutual withdrawal of the older person and society.

*Age Differences in Coping Styles* Older adults tend to use more emotion-focused coping than younger people (Chen et al., 2018; Mélendez et al., 2018); this is particularly true when looking at the oldest old (Martin et al., 2008). Moreover, adults with cognitive impairments and Alzheimer’s disease are less likely to use problem-focused coping strategies, in all likelihood because their impairments reduce their capacity for doing so (Mélendez et al., 2018).

Generally, emotion-focused coping is less adaptive than problem-focused coping. For example, research has shown the use of emotion-focused coping is associated with an increased risk of loneliness (Deckx et al., 2018). However, it is important to note that problem-focused coping is only effective when something can realistically be done about the problem. When a solution is not available, such as might occur with the diagnosis of a terminal illness, it may be more adaptive to control negative or unpleasant emotions. Ideally, both emotion- and problem-focused coping are available for use, thus allowing a more flexible range of responses to stressful events.

Research suggests that adaptive coping is related to health via stress hormone pathways. Such associations may be stronger for older as compared to younger adults (Otte et al., 2005) as well as being more likely to result in dysregulation of the stress response system (Piazza et al., 2018). In one study of more than 500 older adults, those adults who used problem-focused coping strategies and sought social support in the face of stressful events showed lower levels of cortisol, a stress hormone, over the course of the day (O’Donnell et al., 2008). Coping need not be problem-focused for elderly adults to be effective, however. For example, in another study, when older adults had chronic age-related and largely uncontrollable stressors, shifting emotion state with self-compassion (kindness and concern, rather than pity or self-criticism) was associated with lower cortisol levels (Herriot et al., 2018).

The management of stress hormone levels is important because higher cortisol can lead to declines in health over time. For instance, in another study, older adults who did not use adaptive coping strategies and who had high cortisol showed more functional disabilities (i.e., more problems with activities of daily life) over time. Neither those adults who had high cortisol and coped effectively nor those adults who had low cortisol showed similar declines (Wrosch et al., 2009).

### MODELS OF SUCCESSFUL AGING

A considerable body of work has identified three main components of successful aging: (1) avoidance of disease or disease-related disability, (2) maintenance of high physical and cognitive functioning, and (3) sustained, active engagement in social and productive activities (activities, paid or unpaid, that create social value).

Keeping these components in mind, let’s look at some classic and current theories and research about aging well.

**Disengagement Theory versus Activity Theory** Who is making a healthier adjustment to old age: a person who peacefully watches the world go by from a rocking chair or one who keeps busy from morning till night? According to **disengagement theory**, a normal part of aging involves a gradual reduction in social involvement and greater

preoccupation with the self. According to **activity theory**, the more active older people remain, the better they age.

Disengagement theory was one of the first theories in gerontology. Its proponents (Cumming & Henry, 1961) regarded disengagement as a normative, or typical, part of aging. They argued that awareness of the approach of death and declines in physical functioning resulted in a gradual, inevitable withdrawal from social roles. Moreover, because modern industrialized society stops providing useful roles for the older adult, the disengagement is mutual—others do not try to stop it. For a time, this approach was influential, but more than five decades of research have provided little support for disengagement theory, and its influence has largely waned (Achenbaum & Bengtson, 1994).

The second approach, activity theory, takes the opposing viewpoint. Rather than retreating from life, adults who age successfully tend to remain engaged with social roles and connections. The more active they remain in those roles, the more satisfied with life they are likely to be. When they lose a role, such as when they retire, they find a substitute role, such as volunteering (Neugarten et al., 1968). Research generally supports this approach, showing that people who remain active and engaged in their lives report greater well-being and better mental health (Adams et al., 2011; Greenfield & Marks, 2004). For example, retired adults who continued or began to volunteer during the course of one longitudinal study were less likely to show the declines in well-being that other adults did (Wahrendorf & Siegrist, 2010).

However, as originally framed, activity theory is now regarded as overly simplistic. Rather than activity driving satisfaction, it may have been relationships that were responsible for the effect. People who remain active are more likely to maintain high-quality social relationships, and the presence of these relationships is likely to positively affect life satisfaction (Litwin & Shiovitz-Ezra, 2006). In addition, a good proportion of disengaged people are nonetheless happy with their lives, and recent research suggests that disengagement and activity theory may both speak to successful aging. Activity may work best for most people, but disengagement may be appropriate for others, and it may be unwise to make generalizations about a particular pattern of successful aging (Moen et al., 1992; Musick et al., 1999).

**Continuity Theory** What you prefer prior to the later stages of life may influence what you prefer when you reach them. In other words, if you are happy being active now, you are likely to be happy being active later. However, if you are happy being less active now, you may prefer a quieter lifestyle later in life too (Pushkar et al., 2009). This is the primary premise of **continuity theory** (Atchley, 1989). In this approach, activity is viewed as important, not for its own sake but because it represents continuation of a previous lifestyle.

In support of continuity theory, many retired people are happiest pursuing work or leisure activities similar to those they enjoyed in the past (Pushkar et al., 2010). For example, many professors, when given the choice, will opt not to retire (Dorfman, 2009). Moreover, even after they retire, the majority remain involved in professional activities similar to those they participated in when working (Dorfman & Kolarik, 2005). Women who have been involved in multiple roles (such as wife, mother, employee, or volunteer) tend to continue those involvements as they age—and remain happier for having done so (Moen et al., 1992). And people who in middle age enjoyed leisure activities such as reading books, pursuing a hobby, or gardening tended to engage in these activities in old age as well (Agahi et al., 2006).

Continuity in activities is not always possible because some older adults must cut back on participation in favorite events due to visual, motor, or cognitive impairments.



*Older people who feel useful to others, as this grandparent does to his grandson, are more likely to age successfully.*

Steve Mason/Photodisc/Getty Images

#### **activity theory**

Theory of aging that holds that to age successfully, a person must remain as active as possible.

#### **continuity theory**

Theory of aging, described by Atchley, that holds that in order to age successfully, people must maintain a balance of continuity and change in both the internal and external structures of their lives.

Older adults are likely to be happier, however, if they can maintain their favorite activities to some extent.

**The Role of Productivity** Some researchers focus on productive activity, any action that provides a contribution to society, as a key to aging well. Productive activity, whether paid or unpaid, has been found to have positive effects on older adults. For example, research has shown volunteering is associated with a host of positive outcomes, including reduced depression, better health and functional ability, and lower mortality risk (Anderson et al., 2014; Jenkinson et al., 2013). Presumably, this relationship exists because volunteering keeps older adults physically, cognitively, and socially active, and this increased engagement then positively affects health indices. Generally, the more activities adults are involved in and the more time spent on them, the greater the positive effects (Vozikaki et al., 2017; Baker et al., 2005). Similar effects have been found for those adults who continue to work by choice (Choi et al., 2013; Stav et al., 2012).

Some research suggests that frequent participation in leisure activities can be as beneficial to health and well-being as participation in productive activities (Ryu & Heo, 2017), although this effect may be stronger for women (Agahi & Parker, 2008). Social relationships appear to be important here (Stav et al., 2012). Those adults who perceive their social relationships as positive are more likely to engage in leisure activities, and leisure activities are then associated with better health outcomes (Chang et al., 2014). However, this does not mean that leisure activities that are more solitary in nature do not have any benefits. For example, meditation, gardening, reading, listening to the radio, and even quilting have been associated with well-being and quality of life (Geiger et al., 2016; Wang & MacMillan, 2013; Menec, 2003; Machón et al., 2017; Burt & Atkinson, 2012).

**Selective Optimization with Compensation** According to Paul Baltes and his colleagues (Baltes, 1997), successful aging involves strategies that enable people to adapt to the changing balance of growth and decline throughout life. Older adults allocate these resources via a process called **selective optimization with compensation (SOC)**. SOC involves developing abilities that allow for maximum gain, as well as developing abilities that compensate for decline. According to SOC, older adults conserve their resources by:

- Selecting fewer and more meaningful activities or goals.
- Optimizing, or making the most of, the resources they have to achieve their goals.
- Compensating for losses by using resources in alternative ways to achieve their goals.

For example, the celebrated concert pianist Arthur Rubenstein gave his farewell concert at age 89. He was able to compensate for his age-related memory loss by selecting a smaller repertoire of material to play and by practicing longer each day to optimize his performance. He also compensated for declines in motor abilities by slowing down his playing immediately before fast movements, thus heightening the contrast and making the music sound faster (Baltes & Baltes, 1990).

The same life-management strategies apply to psychosocial development. According to Carstensen's (1991, 1995, 1996) socioemotional selectivity theory, older adults become more selective about social contacts, keeping up with friends and relatives who can best meet their current needs for emotional satisfaction. In this way, even though older adults may have fewer friends, the friends that they do have are closer and provide more rewarding social contact (English & Carstensen, 2014).

Research has found that use of SOC is associated with positive developmental outcomes, including greater well-being and increased happiness, and fewer sick days and falls, and less use of pain medications (Baltes & Smith, 2004; Teshale & Lachman, 2016; Zhang & Radhakrishnan, 2018). Eventually, though, older people reach the limit of their available resources, and compensatory efforts may no longer work. Adjusting one's personal standards to changes in what is possible to achieve may be essential to maintaining a positive outlook on life.

## checkpoint can you ...

- ▶ Compare disengagement theory, activity theory, and continuity theory?
- ▶ Discuss the importance of productivity in late adulthood?

### selective optimization with compensation (SOC)

Enhancing overall cognitive functioning by using stronger abilities to compensate for those that have weakened.

Are you satisfied with any of the definitions of successful aging presented in this section? Why or why not?



## checkpoint can you ...

- ▶ Explain how selective optimization with compensation helps older adults deal with losses?

# Practical and Social Issues Related to Aging

Whether and when to retire are among the most crucial lifestyle decisions people make as they approach late adulthood. Another social issue is the need for appropriate living arrangements and care for older people who can no longer manage on their own. (Window on the World reports on stereotypes of older people worldwide.)

## WORK AND RETIREMENT

Retirement took hold in many industrialized countries during the late nineteenth and early twentieth centuries. In the United States, the creation of the Social Security system in the 1930s, together with company-sponsored pension plans, made it possible for many older workers to retire with financial security.

Today the line between work and retirement is not as clear as it used to be. There are no longer strong norms concerning the timing of retirement, how to plan for it, and what to do afterward. Often, a desire to pursue activities other than work or to spend time with family is the impetus for retirement. However, with increasing age, many adults retire because of health reasons (Larrimore et al., 2018). There are multiple interrelated issues, including marital status, current assets and liabilities, the status of dependents, the nature of the work and whether or not age will make that challenging, and the current state of the job market (Gibaldi, 2013).

**Aging and Job Performance** Contrary to ageist stereotypes, older workers can be as productive as younger workers. Although they may work more slowly than younger people, they are more accurate and perform equally well on most jobs (Czaja & Sharit, 1998; Salthouse & Maurer, 1996; McDaniel et al., 2012). Moreover, older employees are often better workers, showing less absenteeism, higher commitment, more knowledge, more professionalism, and more loyalty to their companies (Roscigno et al., 2007; Rozman et al., 2016). The greatest declines in productivity for older workers are seen when problem solving, learning, or speed are important. When experience or verbal abilities matter more, productivity of older workers matches or even exceeds that of younger workers (McDaniel et al., 2012; Skirbekk, 2008).

In the United States, the Age Discrimination in Employment Act, which applies to firms with 20 or more employees, protects workers ages 40 and older from being denied a job, fired, paid less, or forced to retire because of age. Still, many employers exert subtle pressures on older employees (Landy, 1994), and age discrimination is still a factor in employment for older adults (Neumark, 2008). More than 80 percent of older workers experience at least one instance of age discrimination a year (Chou & Choi, 2011).

**Trends in Retirement** In the United States, the average age of retirement in 2016 for men was 64.6 years and for women 62.3 years (Rutledge et al., 2018). Internationally, the average age of retirement across Organisation for Economic Co-operation and Development countries is 64.2 years for men and 63.5 for women (Organisation for Economic Co-operation and Development, 2019). Generally, people from low- and middle-income countries or countries where health conditions are poorer tend to retire at earlier ages (Axelrad, 2018).

Just as retirement ages vary across the world, so do the resources available for aging adults. For example, 68 percent of people worldwide receive some form of retirement benefits. In North America (almost 100 percent) and Europe (95 percent), most adults receive some form of pension. In Central and Southern Asia (26 percent) and sub-Saharan Africa (23 percent), funding for retirement is more limited (United Nations, 2017). Cultures with high levels of poverty or harsh living conditions provide less care for the elderly. The treatment of elders depends much on their usefulness and contribu-



*Discrimination in the workforce is a problem with no easy answers. Somewhat surprisingly, those people who believe in egalitarianism at work and who advocate for women and racial minorities are more ageist than those who are less egalitarian. The authors suggested this ageism may be born of a belief that older people should step aside to allow progress for disadvantaged groups (Martin & North, 2021).*



## AGING STEREOTYPES WORLDWIDE

In America, Australia, the United Kingdom, and many other countries around the world, the elderly are often seen as frail, useless, mentally incompetent, lonely, and a burden to society. Late adulthood is thought of as a time of decline, worry, fear, and loss (Quine et al., 2007). Over the past few decades, as the populations of many nations have aged, these stereotypes have become increasingly negative (Ng et al., 2015).

The belief that elders are treated with reverence and respect in other cultures penetrates our knowledge of Asian countries and many less industrialized nations. However, research shows the story is nuanced. For example, research conducted with Taiwanese and British university students showed that normative cultural beliefs about the elderly—such as whether or not elderly people should be respected—were more positive in Taiwanese students. However, when students were asked about their own personal beliefs, Taiwanese students had more negative attitudes and were more ageist than were British students (Vauclair et al., 2017).

How much ageism is present in a culture depends in part on individualism/collectivism dimension of culture, although the story is complex. For instance, some research has shown that age bias is higher and warmth toward the elderly is lower in individualistic countries (Ackerman & Chopnik, 2021). However, individualism has also been associated with more positive attitudes toward the elderly than collectivism (North & Fiske, 2015). Other cultural values that have been found to be associated with ageism are long-

term orientation (preferences for time-honored traditions and connections to the past) and masculinity (preference for achievement, success, and assertiveness) (Ng & Lim-Soh, 2021).

Ageism can directly impact the elderly as they may internalize negative societal views, hastening physical and mental decline. By the same token, positive views on aging can have beneficial effects. For example, in the Tarahumara society in Mexico, the belief is that people get stronger as they age. Many elders are still able to run great distances and lead very healthy, active lives (Scheve & Venzon, 2017). Research has shown that elders with positive attitudes about aging show lower rates of mental illness, quicker recovery times from illness and stress, and less cognitive decline, and they live longer (McGuire, 2017).

Ideally, social policies should be focused on increasing education, developing positive images of the elderly, and supporting the continuation of independence and resources for elders. The goals of such policies are to increase hope for the future and reduce fears among the elderly, and include assisting with financial and health struggles (Quine et al., 2007).



What do you think we can do to combat negative stereotypes about the elderly? How can you challenge your own beliefs about the elderly?

Despite the fact that more women develop Alzheimer's disease, men tend to have earlier and more problems with forgetting, a tendency that may have more immediate practical consequences for those entering the later stages of life (Petersen et al., 2010).



tions they can provide to others (McGuire, 2017). Without an income source, these older adults may be forced to continue working late into life even if health problems emerge.

In recent years, the proportion of American workers older than 65 years increased sharply, often due to financial need and escalating medical costs (Sterns, 2010). Only 40 percent of those older adults who stopped working in their fifties and sixties stopped for good; the remainder went back to work either part- or full-time before permanently exiting the workforce (Maestas, 2010).

Prior to the COVID-19 pandemic, this graying of the working population was expected to continue to increase through 2024, and workers older than 65 were the fastest-growing labor participation group (US Bureau of Labor Statistics, 2019). However, the pandemic has changed this dynamic. A 2019 survey showed 29 percent of Americans age 65 to 72 years were neither working nor looking for work (Fry, 2019). Since that time, an additional 3.2 million older adults have retired. These retirees were more likely to be Hispanic or Asian, or to live in the Northeast (Fry, 2020). Although older adults were less likely to work in the hardest-hit areas—hospitality and leisure industries—they were more likely to work as part-time employees and less likely to be able to work

remotely. Moreover, those older adults able to retain their jobs face an increased risk of infection or the loss of their health care while simultaneously being the group most vulnerable to complications from COVID-19 infection (Morrisey, 2020; US Bureau of Labor Statistics, 2020, 2020). Given these factors, it is not surprising many older adults opted for retirement.

**Life after Retirement** Retirement is not a single event but a dynamic adjustment process that is best conceptualized as a form of decision making. There are five broad categories of resources that help determine how well a person adjusts to retirement: (1) individual attributes such as health and financial status; (2) preretirement job-related variables such as job stress; (3) family-related variables such as marriage quality and dependents; (4) retirement transition-related variables such as retirement planning; and (5) postretirement activities such as bridge employment and volunteer work (Wang et al., 2011).

The research on adjustment to retirement has supported this model. For example, both physical health and financial situation predict retirement adjustment (Barbosa et al., 2016; Earl et al., 2015). People are also more likely to retire when they are unhappy in their jobs (Browne et al., 2019), and people who retire from jobs they find unpleasant or stressful show increases in well-being (Wang, 2007). In further support of the model, retirees in happy marriages with fewer dependents show higher levels of well-being than other groups (Wang & Shi, 2014; Pinquart & Schindler, 2007). When a spouse dies, this negatively affects retirement adjustment (van Solinge & Henkens, 2008).

Whether and how well people are able to plan for retirement also impact adjustment. Those people who retire earlier than planned or against their will show declines in well-being (Barbosa et al., 2016; Wang & Shi, 2014), whereas the opportunity to plan retirement is associated with well-being and life satisfaction (Wang, 2007). Bridge employment also appears to be beneficial, and in recent research across 16 European countries, it was found to be particularly important for older adults of lower socioeconomic status living without a partner (Dingemans & Henkens, 2019).

People transitioning from working to retirement are particularly likely to volunteer (Tang, 2016), and those who do volunteer are more likely to experience high levels of well-being during retirement (Hao, 2008). Volunteering during retirement has been positively associated with good health and negatively associated with depression, functional limitations, and mortality (Wahrendorf et al., 2016). Volunteering also predicts positive emotionality and protects against declines in well-being associated with major role-identity losses and declines in mental health (Greenfield & Marks, 2004; Hao, 2008). Although older adults who volunteer are more likely to be higher in resources than those who do not (Li & Ferraro, 2005), it nonetheless does appear that volunteering has a positive effect on older adults.

Thus, adjustment to retirement does not depend on one factor alone but rather upon a variety of factors. Additionally, it is not something that happens immediately. Rather, it is a process that occurs over time, dynamically, between a person, important interactional partners, and the various environments the individual is involved with or seeks out.

## FINANCIAL CONCERNs

Since the 1960s, Social Security has provided the largest share of older Americans' income—30 percent in 2021 (Social Security Administration, 2021). Other sources of income include income from assets, private pensions, and earnings. Dependence on Social Security and asset income rises dramatically with age and decreases with income level (Federal Interagency Forum on Aging-Related Statistics, 2020).



*Every year, over 170,000 AmeriCorps seniors volunteer their service to partner organizations dedicated to community improvement. These volunteers are building a home for a low-income family through Habitat for Humanity.*

Hill Street Studios/Blend Images/Getty Images

## checkpoint can you...

- ▶ Describe current trends in late-life work and retirement?
- ▶ Discuss how retirement can affect well-being?
- ▶ Discuss the economic status of older adults and issues concerning Social Security?

Social Security and other government programs, such as Medicare, which covers basic health insurance for US residents who are 65 or older or are disabled, have enabled today's older Americans, as a group, to live fairly comfortably. In 2017, 86 percent of retirees used Medicare (Larrimore et al., 2018). The proportion of older adults living in poverty has fallen from 35 percent in 1959 to 9 percent in 2019 (Administration on Aging, 2020; Federal Interagency Forum on Aging-Related Statistics, 2020). The poverty rate for older adults, while still lower than that of the total population, showed an increase in 2016—the only demographic group to do so (Semega et al., 2017). As the US population grays and as proportionately fewer workers contribute to the Social Security system, it seems likely that benefits will decline (Sawicki, 2005).

Women—especially if they are single, widowed, separated, or divorced or if they were previously poor or worked only part-time in middle age—are more likely (9.7 percent) than men (8.1 percent) to live in poverty in old age. There are also ethnic differences. Older African Americans and Hispanic Americans, at rates of 18.9 and 19.5 percent, respectively, are more likely to live in poverty than older White Americans at 7.3 percent. The highest poverty rates are among older Hispanic women (37.8 percent) who lived alone (Administration on Aging, 2020).

## LIVING ARRANGEMENTS

In developing countries, older adults typically live with adult children and grandchildren in multigenerational households, though this custom is declining. In developed countries, most older people live alone or with a partner or spouse (Kinsella & Phillips, 2005).

In the United States in 2018, about 3 percent of adults age 65 and older lived in senior housing of various types. Because of women's greater life expectancy, about 67 percent of noninstitutionalized men but only about 47 percent of noninstitutionalized women lived with a spouse. Nineteen percent of the men and 31 percent of the women lived alone, although the proportion living alone increases with advancing age. (Figure 1). Minority elders, especially Asian and Hispanic Americans, in keeping with their traditions, were more likely to live in extended family households (Federal Interagency Forum on Aging-Related Statistics, 2020).

**Aging in Place** Most older adults in industrialized countries prefer to stay in their own homes and communities (Aurand et al., 2014). This option, called **aging in place**, makes sense for those who can manage on their own or with minimal help. Most informal caregivers, such as family, who provide aging in place care do so willingly, but it can be a significant source of stress and worry for them (Sanders et al., 2010). While Medicaid provides funds for nursing homes, home and community services are optional for states to fund.

### aging in place

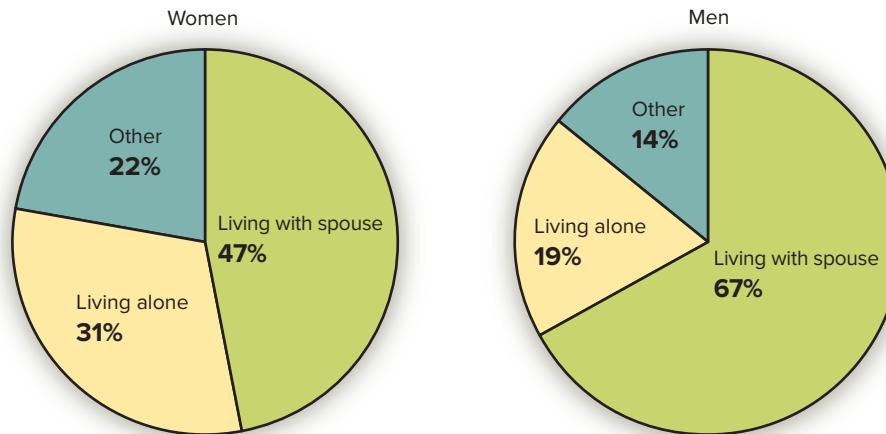
Remaining in one's own home, with or without assistance, in later life.

**FIGURE 1**

Living Arrangements of Noninstitutionalized Men and Women Age 65 and Over, United States, 2018

*In part because of women's longer life expectancy, they are more likely to live alone (especially as they get older), whereas men are more likely to live with a spouse.*

Source: Federal Interagency Forum on Aging-Related Statistics (2020).



## TECHNOLOGY AND AGING IN PLACE

Maintaining independence is important for adults to successfully age in place. This goal can be supported by technologies that enable older adults to monitor their health, communicate, and remain mobile. However, many of these technologies have been complicated to use (Rogers et al., 2001), poorly suited for their intended user (Wang et al., 2019), or lacking in perceived value (Lee, 2014). With recent advancements in automation and artificial intelligence, many of these problems are being addressed.

One area that shows great promise is the field of robotics. A recent study sought to assess how well socially assistive robots improved older adults' social experiences and health outcomes during the COVID-19 pandemic. The researchers found that deploying robots in health care facilities largely improved psychological well-being and reduced the burden on staff and caregivers (Getson & Nejat, 2021). This supports the notion that robotics researchers need to consider not only the older individual's needs but also the needs of institutions and society when developing robotic applications (Mois & Beer, 2020).

Automated vehicles (AVs) are also a promising technology with the potential to improve older adults' independence. Over the last few years, automated vehicles have been deployed for pilot testing around the country. For example, Voyage has been testing driver-less taxis in multiple locations including The Villages, a 125,000-resident retirement community in Florida (Cameron, 2018). Successful widespread implementation of AVs could help older adults carry out day-to-day activities without relying on other people or being inhibited by age-related cognitive or physical changes.

For older people with impairments that make it hard to get along entirely on their own, minor support—such as meals, transportation, and home health aides—often can help them stay put, as can ramps, grab bars, and other relatively low-cost home modifications. Minorities, older adults with lower educational levels, and adults with low levels of social support, although not necessarily those with lower incomes, are less likely to have such modifications (Meucci et al., 2016).

Most older people do not need much help, and those who do can often remain in the community if they have at least one person to depend on. In fact, the single most important factor keeping people out of institutions is being married (Nihtilä & Martikainen, 2008). Increasingly, technological aids such as activity monitoring, wandering detection, and electronic health applications are being used to help keep older adults physically safe and connected to others (Peek et al., 2014). With such help, aging in place can help older adults delay entry into nursing homes (Young et al., 2015; see Research in Action).

To reap the benefits of AVs, older adults must first be willing to adopt this novel technology. Older adults have acknowledged AVs' ability to help them maintain independence and expressed a willingness to use the technology in the form of personal vehicles or public transportation (Faber & van Lierop, 2020). However, research has also shown that age may also be related to a reluctance to accept AV technology (Charness et al., 2018), which means that specific measures will need to be taken to inform and encourage adoption among older adults.

Another class of devices that can help older adults maintain independence is smart-home technology. These devices allow users to monitor their physical states, behaviors, and overall health and well-being. Early pilot studies have demonstrated that smart-home technologies can be a viable way for family members to monitor their loved ones' behavior (e.g., cooking) and for older adults to assess their surrounding environment (e.g., temperature) (Yu et al., 2019). These functions combine with many more to make tasks easier, reduce risks, and contact help in case of an emergency. As with any technology, it is important that companies understand older adults' perspectives to ensure that their needs and concerns are considered in the design process.



What are the privacy implications of using technology to monitor older adults? Do you think using technology in this way will increase or decrease costs associated with caring for the elderly?



One reason many older adults prefer to age in place is because assisted living facilities often do not allow them to bring their pets (Toohey et al., 2017).

**Living Alone** The growth of elderly single-person households has been spurred by greater longevity, increased benefits and pensions, increased homeownership, more elder-friendly housing, greater availability of community support, and reduced public assistance with nursing home costs. Because women live longer than men and are more likely to be widowed, older women in the most developed countries are more likely than older men to live alone (Kinsella & Phillips, 2005). In the United States, about 28 percent of all noninstitutionalized older adults live alone, a greater proportion of which are women. Forty-four percent of women age 75 and older live alone. Older people living alone are more likely than older people with spouses to be poor and to end up in institutions (Administration on Aging, 2020; Kaspar et al., 2010).

Older people who live alone, particularly the oldest old, are more lonely than those who live with others. This is particularly true for women of low socioeconomic level with low education and for those in poor health. Structural factors, such as unsafe neighborhoods, inaccessible housing, or inadequate opportunity for socialization matter too (Cohen-Mansfield et al., 2016). However, such factors as personality, cognitive abilities, physical health, and a depleted social network may play a greater role in loneliness (Martin et al., 2007). Social activities, such as volunteer work, can help an older person living alone stay connected to the community (Carr et al., 2017). Pets, too, can help. One study showed 36 percent less loneliness reported by adults living with a pet compared to those without a pet, and the benefits of pet ownership were highest for adults who lived alone (Stanley et al., 2014). Additionally, technology-based interventions using computers and the internet to address social and emotional needs have also been shown to reduce loneliness (Choi et al., 2012). For example, elderly women living alone showed decreases in salivary cortisol (a stress marker), better sleep, and improved mental function when they were given an interactive communication robot for 8 weeks relative to those who were not provided with an interactive robot (Tanaka et al., 2012).

The older you are,  
the more you are  
likely to say that a  
television is a necessity  
versus a luxury. Younger  
people show the opposite  
pattern (Taylor & Wang,  
2010).



**Living with Adult Children** Historically, older people in many African, Asian, and Latin American societies could expect to live and be cared for in their children's or grandchildren's homes, but this pattern is changing. While there is generally a greater number of surviving generations in a family, they are also less likely to live in the same household together (World Health Organization, 2021). This varies by country. Co-residence with adult children is most common in Asia and least common in Africa (Bongaarts & Zimmer, 2002) and is more common in Southern Europe than in Northern European countries (Hank, 2007).

Most older people in developed countries, even when in difficult circumstances, prefer not to live with their children (Kinsella & Phillips, 2005). They are reluctant to burden their families and to give up their freedom. The parent may feel useless, bored, and isolated from friends. If the adult child is married and the spouse and parent do not get along well or if caregiving duties become too burdensome, the marriage may be threatened (Shapiro & Conney, 2007). Often, moving in with adult children is a consequence of economic pressures; parents move in not because they want to but because they have little choice (Isengard & Szydlik, 2012). Adults, especially women, who move in with relatives are at higher risk of loneliness than those that are able to continue to live with a spouse or partner (Henning-Smith, 2016; Greenfield & Russel, 2011).

Whether or not living with adult children will be successful depends largely on the quality of the relationship that existed in the past and on the ability of both generations to communicate fully and frankly. Often, friction increases as adult children and their aging parents navigate the shifting power dynamics of the relationship. Actions seen by adult children as serving to keep parents safe, such as driving parents to the store rather than allowing them to drive themselves, may be seen by parents as an infringement upon their autonomy and be met with resistance and rejection (Heid et al., 2015). How this conflict is managed has repercussions for both parties. For instance, when adult children give in to conflict repeatedly, they are more likely to become depressed over time, and relationship quality declines. However, when adult children attempt to reason with their aging parents rather than giving in, this is associated with more positive relationship

quality. Being directly confrontational and arguing with parents is associated with negative relationship quality; however, it is also associated with greater provision of support (Heid et al., 2017). Importantly, the provision of support and benefits is a two-way street. Aging parents also provide benefits to their adult children, including emotional support, advice, and practical support (Huo et al., 2018). Indeed, while most informal caregivers do report time constraints and difficulty handling all aspects of caregiving, they also report positive aspects of caregiving (Federal Interagency Forum for Aging-Related Statistics, 2020).

**Living in Institutions** Many older adults opt to age in place if they expect their health to be good but prefer to live with relatives if they anticipate ill health or frailty (Fernández-Carro, 2016). Assisted living or retirement communities are frequently cited as preferred living situations as well, particularly by those who are already living in them (Kaspe et al., 2019). However, many see institutionalization as a last resort and view the transition to a nursing home with trepidation, and fewer than half report a good quality of life once there (Toot et al., 2017). Although many would prefer not to live in nursing homes, many residents are left little choice by dementia, increasing frailty, caregiver illness, or their behavioral issues (Prince et al., 2015; Afram et al., 2014).

The use of nonfamily institutions for care of the frail elderly varies greatly around the world. Institutionalization has been rare in developing regions but is becoming more common even in countries such as Japan that have traditions of elder care. Moreover, declines in fertility have resulted in a rapidly aging population and a shortage of family caregivers (World Health Organization, 2019). In all countries, the likelihood of living in a nursing home increases with age: in the United States, from about 1 percent at ages 65 to 74 to 8 percent at age 85 and over (Administration on Aging, 2021). Most older nursing home residents worldwide and almost 3 out of 4 in the United States are women (Federal Interagency Forum on Aging-Related Statistics, 2004; Kinsella & Velkoff, 2001). In addition to gender, being poor and living alone significantly increase the risk of entering long-term care (Martikainen et al., 2009).

In 2019, there were approximately 1.2 million adults over the age of 65 living in institutional settings (Administration on Aging, 2021). The median cost in 2021 for a private room in a nursing home in the United States was \$9,034 per month (Genworth, 2021). High costs, among other factors, have spurred a shift from institutionalization to less expensive alternative living options and home health care. Nonetheless, as the baby boom generation ages and if current nursing home usage rates continue, the number of residents is projected to rise sharply (Seblega et al., 2010). Such growth would greatly burden Medicaid, the national health insurance program for low-income persons and the major source of payments for nursing home usage.

Federal law sets strict requirements for nursing homes and gives residents the right to choose their own doctors, to be fully informed about their care and treatment, and to be free from physical or mental abuse, corporal punishment, involuntary seclusion, and physical or chemical restraints.

**Alternative Housing Options** A relatively new but growing segment of the housing market is in age-qualified active adult communities. In these communities for people age 55 and older, residents can walk out their front door and find a variety of leisure opportunities, such as fitness centers, tennis courts, and golf courses, close by.

For those who cannot or prefer not to live completely independently, a wide array of group housing options (see Table 1) has emerged. Some of these newer arrangements enable older people with health problems or disabilities to receive needed services or care without sacrificing autonomy, privacy, and dignity.

One popular option is assisted living, housing specifically for older adults (Hawes et al., 2003). Assisted-living facilities enable tenants to live in their own homelike space while giving them easy 24-hour access to needed personal and health care services. In most of these facilities, a person can move, when and if



A recent movement toward "consistent assignment" in nursing homes involves having the same caregivers care for an elderly person on a regular basis, rather than the more common rotation of caregivers. This consistency allows for better monitoring of care and condition, as well as affords the elderly person an opportunity to establish relationships with caregivers (Span, 2010).



Older adults in a retirement village with supportive living facilities keep their minds active. These older adults are taking a computer class in cooperation with a nearby community college.

Katarzyna Bialasiewicz/Stock/Getty Images

**TABLE 1** Group Living Arrangements for Older Adults

Facility	Description
Retirement hotel	A hotel or apartment building remodeled to meet the needs of independent older adults. Typical hotel services (switchboard, housekeeping, message center) are provided.
Retirement community	A large, self-contained development with owned or rental units or both. Support services and recreational facilities are often available.
Shared housing	Housing shared informally by adult parents and children or by friends; social agencies may match unrelated people.
ECHO (elder cottage housing opportunity) housing	An independent unit created so that an older person can live in a remodeled single-family home or in a portable unit on the grounds of a single-family home
Congregate housing	Private or government-subsidized rental apartment complexes, mobile home parks, or group homes that provide meals, housekeeping, transportation, social and recreational activities, and sometimes health care
Assisted-living facility	Semi-independent living in one's own room or apartment. Residents receive personal care (bathing, dressing, and grooming) and protective supervision.
Foster-care home	Owners of a single-family residence take in an unrelated older adult and provide meals, housekeeping, and personal care.
Continuing care retirement community	Long-term housing services for affluent elderly people as their needs change. A resident may start out in an independent apartment, then move into congregate housing, then into an assisted-living facility, and finally into a nursing home.

Sources: Adapted from Laquatra & Chi (1998); Porcino (1993).

As you become older and possibly at least partly incapacitated, what type of living arrangement would you prefer?



necessary, from relative independence (with housekeeping and meals provided) to help with bathing, dressing, managing medications, and using a wheelchair to get around. However, assisted-living facilities vary widely in accommodations, operation, philosophy, and rates, and those offering adequate privacy and services are generally not affordable for moderate- and low-income persons (Hawes et al., 2003). Indeed, assisted-living facilities are disproportionately found in areas with more educated residents and higher incomes (Stevenson & Grabowski, 2010).

## ELDER ABUSE

Elder abuse is a global issue. A recent review involving over 52 studies across 28 low-, middle-, and high-income countries estimated that 15.7 percent of adults age 60 and older are abused. Prevalence rates vary, with Asia at 20.2 percent, Europe at 15.4 percent, and the Americas at 11.7 percent (Yon et al., 2017). In the United States, the estimated prevalence rate is 10 percent (Pillemer et al., 2015), and for every reported case, an estimated 23 cases remain undetected (Storey, 2020).

Elder abuse can include physical abuse, sexual abuse, emotional or psychological abuse, and neglect. Elder abuse can also include financial abuse or exploitation, which involves the use of an older person's resources, such as savings accounts or Social Security payments, for personal gain (Centers for Disease Control and Prevention, 2021). In India and some countries in Africa, childless widows may be forced to marry their late husband's brother, or they may be expelled from their homes. In sub-Saharan Africa, accusations of witchcraft are sometimes leveled against childless widows and used as justification for seizing their land or inheritance and even for murder (Krug et al., 2002).

A number of factors increase the risk of elder abuse, including being female, having difficulty with activities of daily living, poor health, poverty, and having previously been victimized. Dementia and cognitive impairment are also strong predictors of the likeli-

hood of abuse (Burnes et al., 2015; Friedman et al., 2015; Acierno et al., 2010). Perpetrators of abuse are most likely to be family members; to be male; to have a history of mental or physical illness, substance abuse, physical abuse, or violence; and to be unemployed or suffering from economic strain (Lachs & Pillemer, 2015).

Abuse can also occur within the context of nursing homes or residential care communities. Low pay, long hours, physical demands, and minimal education and training contribute to job burnout, demoralization, and high stress levels among staff members. Residents may also have problem behaviors and inflict violence on staff members, which increase odds of neglect or retaliation. Residents also harm one another. Although verbal mistreatment is most common, physical altercations can occur as well. Sexual abuse occurs too, with staff or other residents as common perpetrators (Castle et al., 2015; Lachs & Pillemer, 2015; Lachs et al., 2016).

In most states in the United States, physicians are obligated to screen for elder abuse (Hoover & Polson, 2014). Unfortunately, evidence has not shown that such screenings have an effect on the incidence of elder abuse (Moyer, 2013). Thus, intervention services may have more utility. Although some studies have shown mixed results for these services (Ploeg et al., 2009), others have shown success. For example, one community-based intervention program utilizing law enforcement, supportive social services, and coaching of at-risk older adults showed promise in reducing risk factors for abuse over the course of the study (Mariam et al., 2015).

## checkpoint can you...

- Compare various kinds of living arrangements for older adults, their relative prevalence, and their advantages and disadvantages?
- Discuss the risk factors for and different types of elder abuse?

# Personal Relationships in Late Life

Our stereotypes often lead us to believe that old age is a time of loneliness and isolation. While it is true that older adults, especially men, have far fewer people in their social networks than younger adults do (English & Carstensen, 2014; McLaughlin et al., 2010), this does not mean older adults are necessarily isolated and lonely. For instance, meta-analyses including people from a variety of countries indicate that loneliness remains essentially unchanged from adolescence to old age (Mund et al., 2019), although there are some indications that it may increase in the very oldest old (Luhmann & Hawkley, 2016).

## THEORIES OF SOCIAL CONTACT AND SUPPORT

According to social convoy theory, aging adults maintain their level of social support by identifying members of their social network who can help them and avoiding those who are not supportive. As former coworkers and casual friends drop away, most older adults retain a stable inner circle of social convoys: close friends and family members on whom they can rely and who strongly affect their well-being (Antonucci & Akiyama, 1995).

A somewhat different explanation of changes in social contact comes from socio-emotional selectivity theory (Carstensen, 1991). As remaining time becomes short, older adults tend to become more selective about social contacts, keeping up with friends and relatives who can best meet their current needs for emotional satisfaction. A college student may put up with a disliked teacher for the sake of gaining needed knowledge; an older adult may be less willing to spend precious time with a friend who gets on their nerves. In this way, even though older adults may have fewer friends, the friends that they do have are closer and provide more rewarding social contact (English & Carstenson, 2014).

Thus, even though older adults may have smaller social networks than younger adults do, they tend to have as many very close relationships (Cornwell et al., 2008), and they report greater satisfaction with their relationships than do younger adults (Luong et al., 2011). Their positive feelings toward old friends are as strong as those of young adults, and their positive feelings toward family members are stronger (Charles & Piazza, 2007).

Moreover, despite their smaller social networks, older adults retain a close circle of confidants (Cornwell et al., 2008). Furthermore, the relationships older adults do maintain are more important to their well-being than ever (Charles & Carstensen, 2007) and help keep their minds and memories sharp (Kuiper et al., 2016).

## RELATIONSHIPS AND HEALTH

*What's so funny?  
That depends on your  
age. Older adults don't tend  
to find aggressive humor,  
such as a clip from The  
Office in which boss  
Michael insults an  
employee, to be very funny.  
They prefer more socially  
appropriate humor that  
builds bonds with others  
(Stanley et al., 2014).*



Most of us want and need the support and love of others around us, and we are happier when part of a social community. Because of this need, social isolation—or loneliness—is an important outcome variable that affects both psychological and physical health. Indeed, strong social relationships are as important for health and mortality as smoking, being obese, and abusing alcohol (Holt-Lunstad et al., 2010).

People who are socially isolated and lonely tend to show more rapid physical and cognitive declines than those who are not, even very late in life (Cherry et al., 2013; Luo et al., 2012). They are at higher risk for a variety of different adverse mental health outcomes, including depression, anxiety, schizophrenia, suicide, dementia, and Alzheimer's disease. Additionally, they are more likely to be diagnosed with heart disease and other cardiovascular conditions, as well as cancer (Malcolm et al., 2019). Moreover, the feeling of being useless to others is a strong factor for disabilities and mortality (Tilvis et al., 2012; Gu et al., 2017). Conversely, a recent meta-analysis including 10 studies and over 136,000 respondents indicated having a purpose in life was associated with decreased risk of heart attack and death (Cohen et al., 2016).

Over time, depressed people with poor social support are likely to become even more depressed and to report even greater loneliness (Wang et al., 2018). By contrast, good social support, including having a spouse or partner, living with family, having a large social network, and having more contact with loved ones is associated with less depressive symptomatology in the elderly (Mohd et al., 2019). To be beneficial, however, relationships must be of good quality. If they are marked by criticism, rejection, neglect, control, or undermining behaviors, they can serve as chronic stressors (Rook, 2015).

## THE MULTIGENERATIONAL FAMILY

*A new term has  
emerged to describe  
individuals tasked with  
caring for children as well  
as aging parents: the  
sandwich generation.*



Historically, families rarely spanned more than three generations. Today, many families in developed countries can include four or more generations, making it possible for a person to be both a grandparent and a grandchild at the same time (Costanzo & Hoy, 2007). This has led to the rise of multigenerational families, in which grandparents, their adult children, and grandchildren live under the same roof.

The presence of so many family members can be enriching, but it also can create special pressures (Dunifon et al., 2014). While there is great variability, older adults are as a group more likely to suffer from debilitating disease or infirmity, and their care can be physically and emotionally draining (Gonyea, 2013). Given the rapid growth in the population of adults 85 and older (Ortman et al., 2014), many people in their late sixties or beyond, whose own health and energy may be faltering, may find themselves serving as caregivers. Generally, the burden of this intergenerational care falls to women (Gonyea, 2013; Cook & Cohen, 2018), due in part to gender role norms of women as caregivers.

The ways families deal with these issues often have cultural roots. People from cultures that strongly focus on familial bonds are, not surprisingly, more receptive to the needs of their aging parents and more likely to offer support than are people from more individualistic cultures (Kalmijn & Saraceno, 2008; Tomassini et al., 2007). For example, the nuclear family and the desire of older adults to live apart from their children reflect dominant US values of individualism, autonomy, and self-reliance, while Hispanic and Asian American cultures traditionally emphasize lineal, or intergenerational, obligations (Johnson, 1995).

Most older people in Africa, Asia, the Caribbean, and Latin America live with their adult children. In Spain, Italy, and Greece, about 20 percent of older adults live with at

least one child. And in Afghanistan and Pakistan, more than 90 percent of older adults lived with their children or extended family members (United Nations, 2019). These findings are broadly in line with the expected patterns, given the collectivism/individualism scale. There are suggestions that the accelerating pace of globalization will result in a movement away from the more traditionally oriented family bonds found in many countries and toward the individualistic style more characteristic of more economically stable nations (Costanzo & Hoy, 2007).

In 2016, 20 percent of the US population lived in multigenerational families, a number that has increased since the low of 12 percent in 1980. Not surprisingly, Asian American, Hispanic, Black, and immigrant families in the United States are more likely to live in multigenerational homes, although the increase recently seen is shared across all ethnic groups (Cohn & Passel, 2018; Dunifon et al., 2014).

## checkpoint can you . . .

- Tell how social contact changes in late life, and discuss theoretical explanations of this change?
- Explain the importance of positive social contact and social support, and cite evidence for a relationship between social interaction and health?
- Discuss issues concerning the new multigenerational family?

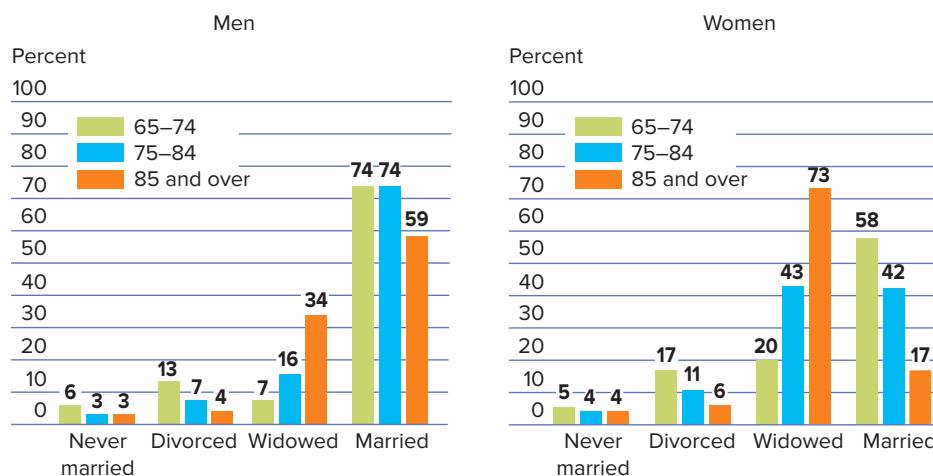
# Marital and Long-Term Relationships

Unlike other family relationships, marriage—at least in contemporary Western cultures—is generally formed by mutual consent. What happens to marital quality in late life?

## MARRIAGE

Because women usually marry older men and outlive them and because men are more likely to remarry after divorce or widowhood, a higher proportion of men than women throughout the world are married in late life (Andrew et al., 2018; see Figure 2).

Married couples who are still together in late adulthood are more likely than middle-aged couples to report higher satisfaction and fewer adjustment problems in their marriages (Orathinkal & Vansteenkoven, 2007; Tavakol et al., 2017). This may be because spouses who remain together are likely to have worked out their differences. Marriage satisfaction is important because it has been related not just to psychological well-being but also to multiple positive health indices (Carr et al., 2014; Robles et al., 2014; Margelisch et al., 2017).



Note: Married includes married, spouse present; married, spouse absent; and separated. These data refer to the civilian noninstitutionalized population.

Source: Andrew et al. (2016).

**FIGURE 2**  
Marital Status of the US Population Age 65 and Over by Age Group and Sex, 2016

*Because of women's greater longevity, they are more likely than men to be widowed in late life, whereas men are more likely to be married or remarried in late life.*

*Many couples who are still together late in life say they are happier in marriage now than they were in their younger years. Important benefits of marriage include intimacy, sharing, and a sense of belonging to one another.*

Stockbyte/Getty Images



*Intimacy is important to older gay men, as it is to older heterosexual adults. Contrary to stereotypes, homosexual relationships in late life tend to be strong and supportive.*

Thinkstock/Stockbyte/Getty Images

The way couples resolve conflicts is key to marital satisfaction throughout adulthood. Married people with more discord in their marriages tend to be anxious and depressed, whereas those with less-discordant marriages tend to have higher self-esteem and report higher levels of marital satisfaction (Whisman et al., 2018; Schmitt et al., 2007). Patterns of conflict resolution tend to remain fairly constant throughout a marriage, and those couples who believe strongly in marriage, share responsibility for decision making, and share household chores are more likely to report low levels of conflict and high levels of happiness in their marriage (Kamp & Taylor, 2012). **The way emotions are handled matters as well. Marriage partners, especially wives, who are able to successfully regulate negative emotions and communicate effectively are more likely to report high marriage satisfaction (Bloch et al., 2014; Tavakol et al., 2017).**

Late-life marriage can be severely tested by advancing age and physical ills, though a close marital relationship can moderate the negative psychological effects of functional disabilities by reducing psychological distress (Jean et al., 2017). However, spouses who care for disabled partners may feel isolated, angry, and frustrated, especially if they are in poor health themselves. Such couples may be caught in a vicious cycle: The illness puts strains on the marriage, and these strains may then aggravate the illness (Karney & Bradbury, 1995), putting the caregiver's health and well-being at risk (Graham et al., 2006). For example, when one spouse is hospitalized, the other's risk of death increases (Christakis & Allison, 2006).

Spousal caregiving late in life often ends with the institutionalization or death of one partner. A longitudinal study of more than 2,000 older couples captured the fragile nature of spousal caregiving in late life. At the beginning of the study, all couples were living independently in the community. Eight years later, 20.7 percent of the husbands and 18.1 percent of the wives had been institutionalized. Moreover, 17.1 percent of husbands and 33.1 percent of wives became widowed over the course of the study (Noël-Miller, 2010).

**LGBTQ+ Relationships** There is little research on relationships for sexual minorities in old age, largely because the current cohort of older adults grew up at a time when living openly as gay or lesbian was rare (Fredriksen-Goldsen & Muraco, 2010). For aging LGBTQ+ people who recognized their homosexuality before the rise of the gay liberation movement in the late 1960s, their self-concept tended to be shaped by the then-prevailing stigma against homosexuality.

The research that does exist shows LGBTQ+ relationships in late life tend to be strong, supportive, and diverse. Many individuals have children from earlier marriages; others have adopted children. Friendship networks or support groups—a chosen family—may substitute for the traditional family (Reid, 1995). Those who have maintained close relationships and strong involvement in the LGBTQ+ community tend to adapt to aging with relative ease (Friend, 1991; Reid, 1995). However, living with a partner, whether married or cohabitating, has an additional protective effect against loneliness (Kim & Fredriksen-Goldsen, 2016). Moreover, married LGBTQ+ adults and unmarried partners report better physical health than do single LGBTQ+ adults (Goldsen et al., 2017).

The main problems of many older LGBTQ+ people grow out of societal attitudes. Often there are strained relationships within the family of origin. A common issue is discrimination in nursing homes and social service agencies, and discriminatory policies against same-sex living arrangements. Although marriage equality laws have reduced the extent of discrimination, unmarried individuals may face significant barriers in the event a partner falls ill or dies. They may have difficulty dealing with health care providers and managing bereavement and inheritance issues, and lack access to a partner's Social Security benefits (Orel, 2004; Kim & Fredriksen-Goldsen, 2016; Knochel et al., 2011; Rawlings, 2012; Addis et al., 2009).

## WIDOWHOOD

With increasing age, death of a spouse becomes more common and more so in women than in men. Women tend to outlive their husbands and are less likely than men to marry again. As Figure 2 shows, US women age 65 and over are far more likely than men of the same age to be widowed, and by the age of 85, women are twice as likely to be widowed as men (Federal Interagency Forum on Aging-Related Statistics, 2020).

Widowhood has been repeatedly associated with increased mortality, with the sharpest declines seen in the first 6 months following the death of a spouse (Shor et al., 2012; Moon et al., 2011) and in rural rather than urban areas (Wright et al., 2015). Risk is higher for unexpected deaths (Sullivan & Fenelon, 2013). Although becoming widowed is a risk for both men and women, men appear to be affected more strongly by the loss of a spouse. For example, older widowed men are far more likely to be institutionalized than older widowed women following the death of a spouse (Nihtilä & Martikainen, 2008). Additionally, while women's mortality risk following the death of a spouse is 15 percent, men's increased risk is 27 percent (Shor et al., 2012).

## DIVORCE AND REMARRIAGE

Divorce in middle-aged and older adults, although rare, has risen. The divorce rate has approximately doubled since the 1990s in adults age 50 and older, and it has nearly tripled in those 65 years of age and older (Stepler, 2017). This rise can be attributed to a variety of factors. First, increasing life expectancy increases the risk of divorce as people may be unwilling to spend long periods of time with a spouse they find unsuitable. As a correlate to this, remarriages, which also become more common with increasing age, are more likely to result in divorce than first marriages. Also, as divorce becomes more common, it also becomes more acceptable. Last, women's participation in the workforce has given them more economic security and hence lessened the financial burden of divorce for many women (Brown & Lin, 2012).

In 2013, 67 percent of divorced or widowed adults age 55 to 64 years and 50 percent of those 65 and older remarried, an increase from previous years. Men are somewhat more likely to remarry, a difference that emerges sometime in middle age. This gender gap has decreased since the 1960s and most strikingly for younger cohorts. In 1960, the gender gap was plus-29 for adults 55 to 64 years of age and plus-28 for adults over 65. These numbers are now, respectively, plus-8 and plus-26 (Livingston, 2014).

## checkpoint can you...

- Discuss factors affecting marital satisfaction in late adulthood?
- Discuss strengths and problems of gay and lesbian relationships in late life?
- Explain gender differences in the prevalence of widowhood?
- Tell why divorce in late life is rare, and identify the special character of remarriage in late adulthood?

# Nonmarital Lifestyles and Relationships

## SINGLE LIFE

In the United States, the number of single older adults has risen in the past few decades. This demographic change reflects a number of influences, including a decision to delay or forgo marriage, liberalization of divorce, cohabitation, and unmarried parenthood. In the United States, approximately 6 percent of men and 5 percent of women 65 years or older have never been married (Federal Interagency Forum on Aging-Related Statistics, 2020), and approximately 37 percent of baby boomers, who began to turn 65 in 2011, are unmarried (Brown & Wright, 2017).

In most countries, 5 percent or less of older men and 10 percent or less of older women have never married. In Europe, this gender difference may reflect the toll on marriageable men taken by World War II, when today's older cohort were of marrying age. In some Latin American and Caribbean countries, proportions of never-marrieds are higher, probably due to the prevalence of consensual unions (Kinsella & Phillips, 2005).

When compared to divorced or widowed people, older never-married adults in the United States are more likely to prefer single life and less likely to be lonely (Dykstra, 1995), even though they are most likely to live alone and receive the least social support. They are less likely to experience "single strain"—chronic practical and emotional stressors attributed to the lack of an intimate partner (Pudrovska et al., 2006).

However, when compared to married adults, never-married people, especially men, are disadvantaged (Lin & Brown, 2012). They do not benefit from the protective effects of marriage on morbidity and mortality discussed earlier, and they are as likely to have poor health (Tamborini, 2007) and be at higher risk of death as divorced or widowed adults (Rendall et al., 2011). Moreover, they are more likely to live in poverty than married couples, as well as divorced and widowed older adults (Tamborini, 2007).

Approximately 14 percent of single adults age 57 to 85 years are in a dating relationship (Brown & Shinohara, 2013). Previously married older men are more likely to date than previously married older women, probably because of the greater availability of women in this age group. Men prefer to date women who are younger than they are, whereas women show a preference for older men until age 75, after which they prefer younger men as well (Alterovitz & Mendelsohn, 2009). Many elderly daters are sexually active but do not expect to marry. Among both Whites and Blacks, men are more interested in romantic involvement than women, who may fear getting locked into traditional gender roles (Bulcroft & Bulcroft, 1991; Tucker et al., 1993).

Some adults classified as "single" in traditional studies are nonetheless in committed relationships. In recent decades, there has been an increase in "living apart together" (LAT) relationships in both Europe and the United States (Liefbroer et al., 2015; Strohm et al., 2009). LAT unions are monogamous intimate relationships between unmarried people who live in different households. While reasons vary, older adults are more likely to enter into a LAT relationship rather than marriage in order to maintain their autonomy, retain control of their finances, and, particularly for women, avoid being placed in the role of caregiver (Upton-Davis, 2012). Generally, both men and women report high levels of happiness and support and low levels of strain within their LAT relationships (Lewin, 2017), perhaps because those individuals who are unhappy find it relatively easy to leave the relationship. Research suggests that while those people in LAT unions are highly attached to their partners, they do not necessarily expect the relationship to be long-lasting and show ambivalence with respect to the possibility of providing assistance in the event the relationship partner becomes ill (van der Wiel et al., 2018; Gierveld, 2015).

About a quarter of adults age 65 or older have tried online dating (Barroso & Brown, 2021).



## COHABITATION

Cohabitation rates have risen sharply for older Americans. In 2007, approximately 2.3 million adults 50 years and older were cohabitating. By 2016, this number had risen to 4 million, a 75 percent increase (Stepler, 2017). Although younger adults sometimes view cohabitation as a prelude to marriage, older adults are more likely to view it as an alternative to marriage (Brown et al., 2012). Approximately 74 percent of cohabitating adults over the age of 50 were previously married, whereas younger cohabitants have most commonly never been married (Stepler, 2017).

Generally, cohabitating relationships tend to be quite stable in older adults, a finding that is especially true for women 65 years and older (Brown et al., 2012; Vespa, 2012). This may be because such relationships generally tend to be at least as satisfying as marriage. Research has shown that cohabitators report equal levels of emotional satisfaction, pleasure, openness, time spent together, criticism, and demands as married couples (Brown & Kawamura, 2010). The benefits of cohabitation are most true for men. While women derive equal benefits from merely dating, for men, living in the same home is key (Wright & Brown, 2017).

In younger adults, cohabitation is often the result of economic concerns. However, this does not seem to be the case in older adults. Factors such as wealth (Vespa, 2012), owning a home, receiving Social Security payments or a pension, or having private health insurance (Brown et al., 2012) do not seem to affect the likelihood that a couple will choose to cohabit. Perhaps older adults, particularly women, are hesitant to marry and prefer to cohabit because of the possibility of having to provide care to a disabled or sick partner later in life (Noël-Miller, 2011). In support of this interpretation, cohabitating women are least likely to eventually marry if they are in good health and are financially well-off (Vespa, 2013).

## FRIENDSHIPS

Maintaining friendships is important for well-being. Most older people have close friends, and, as in early and middle adulthood, those with an active circle of friends tend to be healthier and happier (Golden et al., 2009; Huxhold et al., 2013). Emotional closeness seems to be a key factor. People who can confide their feelings and thoughts and can talk about their worries and pain with friends tend to deal better with the changes and crises of aging (Genevay, 1986) and to live longer (Steinbach, 1992). When emotional closeness is lacking, more frequent contact with friends does not impact feelings of loneliness (Drageset et al., 2011). However, regardless of closeness, those people who are not getting as much contact as they desire are more likely to feel lonely (Nicolaisen & Thorsen, 2017).

Although friends cannot replace a spouse or partner, they can help compensate for the lack of one (Hartup & Stevens, 1999). When family relationships are poor, older adults tend to have closer relationships with friends, and this in turn is associated with well-being (Wrzus et al., 2012). For example, never-married, divorced, and widowed older adults who receive high levels of emotional and practical support from friends are less likely to be lonely (Dykstra, 1995). Similarly, social network size and social support are key protective factors against poor health, disability, and depression for lesbian, gay, and bisexual older adults (Fredriksen-Golden et al., 2013).

In line with social convoy and socioemotional selectivity theories, longtime friendships often persist into very old age (Antonucci et al., 2013). However, losing friends, either because of conflict, death, or relocation, is a relatively common experience, especially for individuals in lower socioeconomic strata (Rook & Charles, 2017; Cornwell, 2014). This is a particularly pressing issue for women, who are more likely to survive their husbands (d'Epina et al., 2010). Although many older people do make new friends, even after age 85 (Johnson & Troll, 1994), older adults are more likely than younger adults to attribute the benefits of friendship (such as affection and loyalty) to specific individuals who cannot be replaced (de Vries, 1996), and older adults tend to have stronger positive feelings about old friends than about new friends (Charles & Piazza, 2007).

### checkpoint can you...

- Discuss differences between never-married and previously married singles in late life?
- Discuss trends in and effects of cohabitation in late life?
- Identify special characteristics of friendship in old age?

# Nonmarital Kinship Ties

Some of the most lasting and important relationships in late life come not from mutual choice (as marriages, cohabitations, homosexual partnerships, and friendships do) but from kinship bonds. Let's look at these.

## RELATIONSHIPS WITH ADULT CHILDREN

Most older people have living children but, because of global trends toward smaller families, have fewer of them than in previous generations (Dobriansky et al., 2007; Kinsella & Phillips, 2005). In European countries, almost half of adults in their sixties live within 15 miles of their adult children, and about one-third live with an adult child (Hank, 2007). Grandchildren make living in close proximity more likely but decrease the probability of a shared household (Isengard & Szydlik, 2012). The mother-daughter relationship tends to be especially close (Lefkowitz & Fingerman, 2003), and about half of older parents below age 80 report contact with a child, most often a daughter, at least once a week (Hank, 2007).

Co-residence can result from economic pressures and is thus less common in countries with strong welfare services. It is most common in the more traditional Mediterranean countries (Greece, Italy, and Spain) and least common in the Scandinavian countries (Denmark and Sweden) (Hank, 2007). In the United States, about 57.1 percent of people have their nearest adult child living within a close distance to them, and 19.1 percent have an adult child living with them (Choi et al., 2018). Immigrants who arrived to the United States as older adults are most likely to live with and be dependent on adult children (Glick & Van Hook, 2002). The trend toward smaller families means fewer potential family caregivers for ailing, aging parents (Kinsella & Phillips, 2005), increasing the strains on those who do serve as caregivers.

The balance of mutual aid between parents and their adult children tends to shift as parents age, with children providing a greater share of support. Older adults who receive more help from their children than they give them, over time, are more likely to show increases in psychological distress (Reczek & Zhang, 2016). While the provision of support to aging parents can result in declines in well-being for both parents and adult children, a close, high-quality relationship can buffer against this (Merz & Huxhold, 2010; Merz et al., 2009).

Older parents who can do so often continue to provide financial support to children. In less-developed countries, older parents contribute through housekeeping, child care, and socialization of grandchildren (Kinsella & Phillips, 2005). Adults with children doing less well than they would like often have conflicted feelings: They are concerned and want to help but at the same time may feel a desire to be free of responsibility toward adult children or want to encourage independence and autonomy (Birditt et al., 2010; Smith, 2012). They tend to be distressed if their children have serious problems and may consider such problems a sign of their failure as parents (Suttor et al., 1995; Troll & Fingerman, 1996).

In some cases, older people have children who cannot live independently, such as when adult children are mentally ill, cognitively or physically disabled, or stricken with serious illnesses. In these situations, elderly parents must serve as primary caregivers for as long as both parent and child live (Greenberg & Becker, 1988; Ryff & Seltzer, 1995). The strain of this caregiving adds up over time. In middle age, parents of children with intellectual or developmental disabilities have a similar profile to parents of neurotypical children. However, as they enter old age, parents of disabled children have worse physical and mental health (Seltzer et al., 2011). Additionally, the generally unexpected loss of an adult child can result in deep psychological distress and unresolved grief (Van Humbeeck et al., 2013).

A study of 60- to 90-year-old participants asked to evaluate a man who either bragged about himself or about his son showed that bragging about the achievements of those close to us—a process known as burnishing—can lead to perceptions of a person as less capable (Tal-Or, 2010).



Slightly over 8 percent of US adults age 55 and older do not have any children (Margolis & Verdery, 2017). In Europe, approximately 10 percent of adults age 50 and over are childless, ranging from 6 percent in the Czech Republic to 15 percent in Switzerland (Deindl & Brandt, 2017). In China and Korea, by contrast, only about 2 percent of older adults do not have children (Verdery et al., 2019). A survey of research conducted across 66 countries found that having children is not associated with greater well-being, and in fact, it is most commonly associated with decreased well-being. However, context matters. For the oldest age groups and for widowers, the relationship reverses (Stanca, 2016).

Macrosystem variables also affect the outcomes of childlessness. In wealthier countries, parents are more likely to report lower well-being, and in countries where parenting and childbearing are highly valued, childless adults are more likely to report lower life satisfaction and happiness (Stanca, 2016; Tanaka & Johnson, 2016). Thus, parenthood does not guarantee well-being in old age, nor does childlessness necessarily harm it.

## RELATIONSHIPS WITH SIBLINGS

Brother and sisters play an important role in older people's support networks. Relationships with siblings tend to be among the longest lasting of all relationships; 75 percent of adults 70 years of age and older have a living sibling (Cicirelli, 2013; Settersten, 2007). Siblings, more than other family members and friends, tend to provide companionship and emotional support as older adults (Bedford, 1995).

Sibling commitment, meaning the degree to which siblings keep in contact with and help each other out, is relatively stable across the life span (Rittenour et al., 2007). Most siblings report being in contact in some way at least once a week (Stocker et al., 2020), although adult siblings who are married or have children are less close with their siblings than those who are single, divorced, or widowed (Gilligan et al., 2020). Both giving support to (Gierveld & Dykstra, 2008) and receiving support from (Thomas, 2010) a sibling are associated with positive outcomes such as reductions in loneliness. Moreover, although caregivers are still worse off than noncaregivers, data from 19 countries show caring for a sibling is associated with less stress and greater well-being than caring for an ill spouse, child, or parent (Viana et al., 2013).

Sibling relationships are important for well-being. When adults are close to their siblings, they report fewer symptoms of depression, anxiety, hostility, and loneliness (Stocker et al., 2020). However, not all relationships are healthy. Approximately 1 in 10 older adults reports their sibling relationships as being a source of conflict, avoiding contact with siblings, or cutting off siblings (Wooley & Greif, 2020). LGBTQ+ adults, in particular, may suffer from conflictual relationships with siblings as a result of rejection or a lack of support (Reczek et al., 2022). Typically, the sibling relationship between sisters is higher quality and associated with a greater positive influence on well-being than that between brothers (Stocker et al., 2020; Volkom, 2006).

Although the death of a sibling in old age may be understood as normative and becomes increasingly common with advanced age (d'Epinay et al., 2010), survivors may grieve intensely and become lonely or depressed (Cicirelli, 2009). The loss of a sibling represents not only a loss of someone to lean on and a shift in the family constellation but perhaps even a partial loss of identity. To mourn for a sibling is to mourn for the lost completeness of the original family within which one came to know oneself and can bring home one's own nearness to death.



*Elderly siblings are an important part of each other's support network, and sisters are especially vital in maintaining family relationships.*

Hans L Bonnevier/Johner Images/Getty Images

### checkpoint can you...

- Tell how contact and mutual aid between parents and grown children changes during late adulthood and how childlessness can affect older people?
- Discuss the importance of sibling relationships in late life?

# summary and key terms

## Personality Development in Late Adulthood

- Erik Erikson's final stage, ego integrity versus despair, culminates in the virtue of wisdom, or acceptance of one's life and impending death.
- Erikson believed that people must maintain a vital involvement in society.
- Personality traits show complex patterns of stability and change that are predictive of physical and mental health and well-being.

**ego integrity versus despair** (525)

## Well-Being in Late Adulthood

- In research based on the cognitive-appraisal model, adults of all ages generally prefer problem-focused coping, but older adults do more emotion-focused coping than younger adults when the situation calls for it.
- Religion is an important source of emotion-focused coping for many older adults. Links have been found between religion or spirituality and health, longevity, and well-being.
- The concept of successful aging reflects the growing number of healthy, vital older adults, but there is dispute over how to define and measure it and over the validity of the concept.
- Two contrasting early models of successful, or optimal, aging are disengagement theory and activity theory. Disengagement theory has little support, and findings on activity theory are mixed. Newer refinements of activity theory include continuity theory and an emphasis on productive activity.
- Baltes and his colleagues suggest that successful aging, in the psychosocial as well as the cognitive realm, may depend on selective optimization with compensation.

**coping** (529)

**cognitive-appraisal model** (529)

**problem-focused coping** (529)

**emotion-focused coping** (530)

**disengagement theory** (530)

**activity theory** (531)

**continuity theory** (531)

**selective optimization with compensation (SOC)** (532)

## Practical and Social Issues Related to Aging

- Some older adults continue to work for pay, but most are retired. However, many retired people start new careers or do part-time paid or volunteer work. Often retirement is a phased process.
- Older adults tend to be more satisfied with their work and often more productive than younger ones. Age has both positive and negative effects on job performance, and individual differences are more significant than age differences.
- Retirement is an ongoing process. Personal, economic, and social resources may affect morale.
- The financial situation of older Americans has improved, and fewer live in poverty. Women, Hispanic Americans, and African Americans are most likely to be poor in old age.
- In developing countries, the elderly often live with children or grandchildren. In developed countries, most older people live with a spouse or alone. Minority elders are more likely than White elders to live with extended family members.
- Most older adults in industrialized nations prefer to age in place. Most can remain in the community if they can depend on a spouse or someone else for help.
- Older women are more likely than older men to live alone.
- Older adults in developed countries typically do not expect to live with adult children and do not wish to do so.
- Institutionalization is rare in developing countries. Its extent varies in developed countries. Most likely to be institutionalized are older women, older adults who live alone or do not take part in social activities, those who have poor health or disabilities, and those whose informal caregivers are overburdened.
- Fast-growing alternatives to institutionalization include assisted-living facilities and other types of group housing.

**aging in place** (536)

## Personal Relationships in Late Life

- Relationships are important to older people, even though frequency of social contact declines in old age.
- According to social convoy theory, reductions or changes in social contact in late life do not impair well-being because a stable inner circle of social support is maintained. According to socioemotional selectivity theory, older people choose to spend time with people who enhance their emotional well-being.
- Social interaction is associated with good health and life satisfaction, and isolation is a risk factor for mortality.
- The way multigenerational late-life families function often has cultural roots.

## Marital and Long-Term Relationships

- As life expectancy increases, so does the potential longevity of marriage. More men than women are married in late life. Marriages that last into late adulthood tend to be relatively satisfying.
- Although a growing proportion of men are widowed, women tend to outlive their husbands and are less likely to marry again.
- Divorce is uncommon among older people, and most older adults who have been divorced are remarried. Remarriages may be more relaxed in late life.

## Nonmarital Lifestyles and Relationships

- A small but increasing percentage of adults reach old age without marrying. Never-married adults are less likely to be lonely than divorced or widowed ones.
- Older adults are more likely to cohabit after a prior marriage than before marriage.
- Many gays and lesbians adapt to aging with relative ease, particularly if they maintain relationships as well as involvement in the gay community. However, they may face difficulties as a result of discrimination.
- Most older adults have close friends, and those who do are healthier and happier.
- Older people enjoy time spent with friends more than with family, but the family is the main source of emotional and practical support.

## Nonmarital Kinship Ties

- Older parents and their adult children frequently see or contact each other, are concerned about each other, and offer each other assistance. Many older parents are caregivers for adult children.
- In some respects, childlessness does not seem to be an important disadvantage in old age.
- Often siblings offer each other emotional support, and sometimes more tangible support as well. Sisters, in particular, maintain sibling ties.

## outline

- The Meaning of Death and Dying
- Facing Death and Loss
- Significant Losses
- Medical, Legal, and Ethical Issues
- Finding Meaning and Purpose in Life and Death

## learning objectives

- Describe the cultural and historical contexts of death and dying.
- Discuss death and bereavement as well as attitudes about death and dying across the life span.
- Identify the challenges of coping with the death of another person.
- Evaluate issues involved in decisions about death.

# Dealing with Death and Bereavement



Steve Smith/Tetra images/Getty Images

## did you know?

- A marked cognitive decline, in the absence of known physical illness, can predict death nearly 15 years later.
- Research has challenged earlier notions of a single, “normal” pattern of grieving.
- Children as young as 4 may have some understanding of what happens after death but may not fully understand it until well into the school years.

*In this chapter, we discuss how people of different cultures and ages think and feel about death and dying. We examine patterns of grief and how people cope with significant loss. We look at questions raised about life support and examine whether people have the right to die. Finally, we consider how confronting death can give life greater purpose.*



**W**hat is life? It is the flash of a firefly in the night. It is the breath of a buffalo in the wintertime. It is the little shadow which runs across the grass and loses itself in the sunset.

—Chief Crowfoot (1830–1890)

## The Meaning of Death and Dying

Death is a biological fact, but it also has social, cultural, historical, religious, legal, psychological, developmental, medical, and ethical aspects, and often these are closely intertwined.

Let's look more closely at death and mourning in their cultural and historical context.

### THE CULTURAL CONTEXT

Customs concerning the disposal and remembrance of the dead, transfer of possessions, and even expression of grief vary greatly from culture to culture and often are governed by religious or legal prescriptions that reflect a society's view of what death is and what happens afterward. Cultural aspects of death include care of and behavior toward the dying and the dead, the setting where death usually takes place, and mourning customs and rituals—from the all-night Irish wake, at which friends and family toast the memory of the dead person, to the weeklong Jewish shiva, at which mourners vent their feelings and share memories of the deceased. Some cultural conventions, such as flying a flag at half-mast after the death of a public figure, are codified in law.

Although there are wide variations in customs surrounding death, there are nonetheless some commonalities in the experience across cultures. Expressions of grief, anger, and fear are common across cultures, and most cultures have socially sanctioned ways of expressing these emotions within the context of mourning or funeral practices (Parkes et al., 2015). Beliefs about the dead also show some commonalities. In most countries, although religious behavior has declined over time, most people nonetheless believe in the afterlife. Across several studies, participants from Europe, Central America, Asia, the Caribbean, and South America all shared beliefs that the “soul” of the dead person would pass on to some sort of afterlife, and they had rituals or ceremonies intended to facilitate this transition (Bechert & Quandt, 2013; Lobar et al., 2006; see Window on the World).

### THE MORTALITY REVOLUTION

Until the twentieth century, in all societies, death was a frequent, expected event, sometimes welcomed as a peaceful end to suffering. Caring for a dying loved one at home was a common experience, as it still is in some rural communities.



Even when a person is brain dead, it is possible for spinal reflexes to cause movement. In one particularly creepy variation called the Lazarus sign, the dead person raises their arms and crosses them over the chest (Urasaki et al., 1992).



Most gladiators died as a result of traumatic brain injury (Kanz & Grossschmidt, 2006).

### checkpoint can you...

- Give examples of cross-cultural differences in customs and attitudes related to death?



## CULTURAL VARIATIONS IN FUNERAL CUSTOMS

Funerals in America or Europe are generally held at a church or funeral home. People dress in black, a service is held, and the deceased is either buried or cremated. There is often a visitation before the service and a gathering held at the home or church of the family. Though this is the common tradition in much of the Westernized world, it is not the only tradition.

In ancient Greece, bodies of heroes were publicly burned as a sign of honor. Cremation still is widely practiced by Hindus in India and Nepal. In contrast, cremation is prohibited under Orthodox Jewish law in the belief that the dead will rise again for a last judgment and the chance for eternal life (Ausubel, 1964).

The deceased must be buried as soon as possible in traditional Islamic burials, usually within 24 hours, to free the soul from the body. The body is washed, and a burial shroud is placed over it. The deceased is laid facing Mecca, preferably without a casket. Burial sites are unmarked or simply marked. During the 3-day mourning period, the family says daily prayers for the loved one (Rahman, 2011).

For the Toraja in Indonesia, the funeral is a celebration of life. Funerals are elaborate and expensive, and the whole community takes part. The person is embalmed, symbolically fed, and cared for during a series of ceremonies, remaining part of the family until the final burial takes place on the 11th day of the ceremonies. Each year during a ritual called *Ma' Nene*, the bodies are exhumed, cleaned, and dressed in new clothes and walked around the village (Holloway, 2014).

In Tibet, sky burial rituals are based on the Buddhist belief that the spirit leaves the body the mo-

ment a person dies and the body should be returned to the earth and recycled. In the sky burial, the body is dissected and placed on a high cliff where it is offered up to hungry vultures, a final act of kindness to other creatures, contributing to the life cycle (Kerala, 2005).

Cremation has become more common in South Korea due to lack of space to bury the dead. Rather than storing ashes, many people are choosing to turn their loved ones' remains into beads. The beads are colorful and are stored in glass containers to keep the loved ones close (*The Week*, 2012).

In Mexico and Latin America, on November 2, the Day of the Dead, families gather to remember and honor those who have passed. It is often celebrated with festivals; families eat, sing, and tell stories about deceased loved ones. Families may visit the gravesite or create an altar for the family member, decorating it with candles, flowers, and the favorite foods of the deceased (Benedetti, 2017).

All these varied customs and practices help people deal with death and bereavement through well-understood cultural meanings that provide a stable anchor amid the turbulence of loss.



What do the funeral traditions in your culture say about conceptions of death and the afterlife? How do they help people handle death?

Great historical changes regarding death and dying have taken place since the late nineteenth century, especially in developed countries. Advances in medicine and sanitation, new treatments for many once-fatal illnesses, and a better-educated, more health-conscious population have brought about a mortality revolution. Women today are less likely to die in childbirth, infants are more likely to survive their first year, children are more likely to grow to adulthood, young adults are more likely to reach old age, and older people often can overcome illnesses they grew up regarding as fatal.

The top causes of death in the United States in the 1900s were diseases that most often affected children and young people: pneumonia and influenza, tuberculosis, diarrhea, and enteritis. Today, nearly three-quarters of deaths in the United States occur among people age 65 and over, primarily from diseases such as heart disease and cancer. In 2020, COVID-19 became the third leading cause of death for Americans. The emergence of COVID-19 is likely responsible for the largest single-year increase (16.8 percent)

in the age-adjusted death rate in the United States since data began to be recorded (Murphy et al., 2021).

Amid all this progress in improving health and lengthening life, something important may have been lost. Looking death in the eye, bit by bit, day by day, people growing up in traditional societies absorbed an important truth: Dying is part of living. As death increasingly became a phenomenon of late adulthood, it became “invisible and abstract” (Fulton & Owen, 1987–1988, p. 380). Such social conventions as placing the dying person in a hospital or nursing home and refusing to openly discuss their condition reflected and perpetuated attitudes of avoidance and denial of death. Death—even of the very old—came to be regarded as a failure of medical treatment rather than as a natural end to life (McCue, 1995).

Today, this picture again is changing. **Thanatology**, the study of death and dying, is arousing interest, and educational programs have been established to help people deal with death. Because of the prohibitive cost of extended hospital care that cannot save the terminally ill as well as a movement toward a more humane end to the life span, many more deaths are now occurring at home, as they once did the world over.

**thanatology**  
Study of death and dying.

## checkpoint

can you...

- Discuss the mortality revolution in developed countries?

# Facing Death and Loss

Death is an important chapter in human development. People change in response to death and dying, whether their own or that of a loved one. What changes do people undergo shortly before death? How do people handle grief? How do attitudes toward death change across the life span?

## FACTORS PRECEDING DEATH

**Terminal Drop** Even without any identifiable illness, people around the age of 100 tend to experience functional declines, lose interest in eating and drinking, and die a natural death (Johansson et al., 2004; Small et al., 2003). There also appear to be changes in life satisfaction that precede death (Windsor et al., 2015; Gerstorf et al., 2010). Such changes also have been noted in younger people whose death is near. In a 22-year longitudinal study of 1,927 men, life satisfaction showed steep declines within 1 year before death, regardless of self-rated health (Mroczek & Spiro, 2005).

**Terminal drop**, or terminal decline, refers specifically to a widely observed decline in cognitive abilities shortly before death, even when factors such as demographics and health are controlled for (Gerstorf & Ram, 2013). This effect has been found in longitudinal studies in various countries—not only of the very old but also of adults of a wide range of ages with no signs of dementia (Johansson et al., 2004; Singer et al., 2003; Rabbitt et al., 2002; Small et al., 2003). Losses of perceptual speed have been found to predict death nearly 15 years later (Thorvaldsson et al., 2008), although most declines start about 7.7 years before death occurs (Muniz-Terrera et al., 2013). While more highly educated people generally perform better on cognitive tests, they show similar rates of decline as do less-educated people. Dementia, however, accelerates the rate of decline in all people (Bendayan et al., 2017). Areas of decline include memory capacity, perceptual speed, visuospatial abilities, and everyday cognition (Gerstorf & Ram, 2013; Thorvaldsson et al., 2008).

**Near-Death Experiences** Some people who have come close to dying report near-death experiences (NDE), often involving a sense of being out of the body or sucked into a tunnel and visions of bright lights or mystical

**terminal drop**  
A frequently observed decline in cognitive abilities near the end of life. Also called *terminal decline*.



*When a brain is deprived of oxygen, certain images arise due to alterations in the visual cortex and can result in the perception of a tunnel, like the images reported by people who have had near-death experiences.*

Mark Gibbons/Alamy Stock Photo



Hospice care seeks to ease patients' pain and treat their symptoms to keep them as comfortable and alert as possible. It also helps families deal with illness and death.

Ron Nickel/Design Pics/Getty Images

#### **hospice care**

Personal, patient- and family-centered care for a person with a terminal illness.

#### **palliative care**

Care aimed at relieving pain and suffering and allowing the terminally ill to die in peace, comfort, and dignity.

A study of objects placed by the bedside of people in hospice care showed that almost all clients had objects to remind them of home—a source of comfort in their last days (Kellehear et al., 2009).



encounters. These types of experiences have been reported in many different cultures, both in modern times and in written and oral histories of nonindustrialized cultures (Tassell-Matamua, 2013). Skeptics generally interpret these reports as resulting from physiological changes that accompany the process of dying. Some researchers argue that near-death experiences reflect the common bodily structures affected by the process of dying (Mobbs & Watt, 2011), in particular, the oxygen deprivation that occurs in 9 out of 10 dying persons (Woerlee, 2005). Research in rats shows that a cardiac arrest, which brings about oxygen deprivation, results in brain waves indicating an aroused, highly functioning brain shortly before death. This suggests humans might experience a similar type of conscious information processing during clinical death (Borjigin et al., 2013). However, not everyone who experiences oxygen deprivation experiences a NDE. In one study of cardiac patients who were "brought back" after clinical death, only about 21 percent reported a NDE (Klemenc-Ketis et al., 2010). Therefore, anoxia cannot be the sole cause of NDEs.

A variety of data from humans, including reports of NDEs in cardiac arrest survivors and individuals undergoing anesthesia; reports of NDE-like experiences in people under the influence of various drugs such as ketamine, LSD, and cannabinoids or under the influence of epilepsy or deliberately induced electrical cortical stimulation; and experiments using mild oxygen deprivation or artificially lowered blood pressure to induce NDE-like sensations, suggest that NDE phenomena are linked to stimulation or damage of various brain areas, most notably in bilateral frontal and occipital areas. The commonly reported altered sense of time, flying sensations, and light reported by some people are theorized to originate in the right hemispheric temporo-parietal junction (TPJ). By contrast, the spiritual dimensions often reported, along with the sounds, music, and voices, are believed to result from the left hemispherical TPJ. Emotions and life review, another commonly experienced aspect of NDEs, are thought to originate from the hippocampus and amygdala (Blanke et al., 2016).

Regardless of their origin, NDEs are generally experienced as positive, an effect that has been proposed to occur as a result of the release of endorphins that are released during stressful experiences (Agrillo, 2011). Some people who experience NDEs report spiritual growth as one consequence, and the degree of spiritual transformation is related to the depth of the NDE (Greyson & Khanna, 2014). NDEs are predicted to occur more frequently in the coming years as survival rates continue to improve with modern resuscitation techniques (Agrillo, 2011; Van Lommel, 2011).

**Care of the Dying** Edith, 82 years old, died of organ failure in a hospital following a 5-day stay. She died alone, afraid, hooked up to machines to help sustain her life for as long as possible, and confused about what was going on. Is this how you would choose to die?

Along with a growing tendency to face death more honestly, movements have arisen to make dying more humane. Primary among these movements is the establishment of **hospice care** for dying persons. Hospice care is personal, patient- and family-centered, compassionate care for the terminally ill. Hospice facilities generally provide **palliative care**, which includes relief of pain and suffering, control of symptoms, alleviation of stress, and attempts to maintain a satisfactory quality of life. However, palliative care is not intended to cure or reverse the course of disease.

Hospice facilities offer a specialized type of palliative care for people whose life expectancy is 6 months or less. The goal is to allow the person to die in peace and dignity, while minimizing any pain and suffering, and it often includes self-help support groups for both dying people and their families.

Hospice care may take place at home, but such care can be given in a hospital or another institution, at a hospice center, or through a combination of home and institutional care. The provision of hospice and palliative care is associated with better outcomes. For instance, patients enrolled in hospice report greater satisfaction and pain control; they are less likely to report difficulty breathing; they spend less time in the hospital; and they are less likely to be admitted to the intensive care unit and less likely to die in the hospital. Their families are more likely to report greater satisfaction with care, higher-quality end-of-life care, and compliance with requests about end-of-life preferences (Kleinpell et al., 2019; Wright et al., 2016; Kumar et al., 2017). Hospice care is likely to have its greatest effects if it is provided early enough to improve quality of life (Gaertner et al., 2017), especially for those individuals who are unlikely to benefit from medical intervention.

## CONFRONTING ONE'S OWN DEATH

**The Five Stages of Grief** The psychiatrist Elisabeth Kübler-Ross, in her pioneering work with dying people, found that most of them welcomed an opportunity to speak openly about their condition and were aware of being close to death, even when they had not been told. After speaking with 500 terminally ill patients, Kübler-Ross (1969, 1970) outlined five stages in coming to terms with death: (1) denial ("This can't be happening to me!"); (2) anger ("Why me?"); (3) bargaining for extra time ("If I can only live to see my daughter married, I won't ask for anything more"); (4) depression; and ultimately (5) acceptance. She also proposed a similar progression in the feelings of people facing imminent bereavement (Kübler-Ross, 1975).

Kübler-Ross's model has been criticized and modified by other professionals who work with dying patients. Although the emotions she described are common, not everyone goes through all five stages and not necessarily in the same sequence. A person may go back and forth between anger and depression, for example, or may feel both at once.

Dying, like living, is an individual experience. For some people, denial or anger may be a healthier way to face death than calm acceptance. Kübler-Ross's findings, valuable as they are in helping us understand the feelings of those who are facing the end of life, should not be considered the sole model or criterion for a "good death."

**Terror Management Theory** Regardless of age, the awareness of death is distressing and has the potential to result in declines in well-being and increases in anxiety (Juhl & Routledge, 2016). One approach—terror management theory (TMT)—proposes that humans' unique understanding of death, in concert with self-preservation needs and capacity for fear, results in common emotional and psychological responses when mortality, or thoughts of death, are made salient.

One common response to thoughts of death is to become more committed to a cultural worldview (Burke et al., 2010). For example, when death is made salient, people are more likely to endorse their religious beliefs, and they believe more strongly in the afterlife (Vail et al., 2010). This stronger adherence to a religious ideology provides psychological comfort.

Another implication of TMT is that high self-esteem should buffer people against anxiety and fear over death. Feeling significant and valuable to others can help people believe they are more than their physical body. Generally, research has supported a link between high self-esteem and reduced anxiety regarding death (Burke et al., 2010).

Last, mortality salience has been associated with attachment processes. Seeking comfort from loved ones is a common response in humans undergoing threat and is a regulatory strategy to reduce anxiety. Therefore, those people who have more secure attachment relationships would be predicted to show less anxiety in the face of death, a finding that has been verified in research (Mikulincer & Florian, 2000). Moreover, when death is made salient, those people who are willing and able to would be predicted to engage in behaviors to increase attachment, such as enhanced commitment,



How do people on death row confront their death? In a survey of their last statements, death row inmates are most likely to talk about forgiveness, claims of innocence, silence, love, activism, and a belief in the afterlife (Heflick, 2005).



People who have had a near-death experience show less fear of death and are more likely to view death as a transition rather than final (Bianco et al., 2019). What would terror management theory predict about these people's endorsement of their cultural worldview, their self-esteem, and their attachment-related behaviors?

attraction, forgiveness, and intimacy, a finding largely verified in research (Plusnin et al., 2018).

## PATTERNS OF GRIEVING

### **grief**

Emotional response experienced in the early phases of bereavement.

### **bereavement**

Response to the loss, due to death, of someone to whom one feels close and the process of adjustment to the loss.

The death of a loved one is a difficult thing. First, there is **grief**, the emotional response that generally follows closely on the heels of death. This is followed by **bereavement**.

Bereavement is a response to the loss of someone to whom a person feels close. But bereavement is not just an event, and it is not just grief—it is also a process of adjustment.

Bereavement often brings about a change in role or status. For example, a person may have to adjust to becoming a widow after previously being a wife or as an orphan after previously being a son or daughter. There may be social or economic consequences as well: a loss of friends and sometimes of income. In short, bereavement can affect practically all aspects of a person's life.

**The Classic Grief Work Model** How do people grieve? A classic pattern of grief is three stages in which the bereaved person accepts the painful reality of the loss, gradually lets go of the bond with the dead person, and readjusts to life by developing new interests and relationships. This process of **grief work**, the working out of psychological issues connected with grief, often takes the following path—though, as with Kübler-Ross's stages, it may vary (Brown & Stoudemire, 1983; Schulz, 1978).

1. *Shock and disbelief.* Immediately following a death, survivors often feel lost and confused. As awareness of the loss sinks in, the initial numbness gives way to overwhelming feelings of sadness and frequent crying. This first stage may last several weeks, especially after a sudden or unexpected death.
2. *Preoccupation with the memory of the dead person.* In the second stage, which may last 6 months to 2 years or so, the survivor tries to come to terms with the death but cannot yet accept it. These experiences diminish with time, though they may recur—perhaps for years.
3. *Resolution.* The final stage has arrived when the bereaved person renews interest in everyday activities. Memories of the dead person bring fond feelings mingled with sadness rather than sharp pain and longing.

**Variations in Grieving** Although the pattern of grief work just described is common, grieving does not necessarily follow a straight line from shock to resolution. In the recovery pattern, the mourner goes from high to low distress. In the delayed grief pattern, there may be moderate or elevated initial grief, and symptoms gradually worsen over time. In the chronic grief pattern, the mourner remains distressed for a long time. Chronic grief may be especially painful and acceptance most difficult when a loss is ambiguous, as when a loved one is missing and presumed dead. In the final pattern, known as resilience, the mourner shows a low and gradually diminishing level of grief in response to the death of a loved one (Bonanno et al., 2011).

What advice would you give a friend about what to say—and what not to say—to a person in mourning?



Some people recover quickly from the loss of a loved one; others never do.

PitukTV/Shutterstock

## BOX 1 Helping Someone Who Has Lost a Loved One

These suggestions from mental health professionals may enable you to help someone you know through the grieving process:

- **Share the sorrow.** Allow—or encourage—the bereaved person to talk about feelings of loss and share memories of the deceased person.
- **Don't offer false comfort.** Saying such things as “It's all for the best” or “You'll get over it in time” is not helpful. Instead, simply express sorrow—and take time to listen.
- **Offer practical help.** Babysitting, cooking, and running errands are ways to help someone who is grieving.
- **Be patient.** It can take a long time to recover from a significant loss. Be available to talk and listen.
- **Suggest professional help when necessary.** Don't hesitate to recommend professional help when it appears that someone is experiencing too much pain to cope alone.

Source: Mental Health America (2022).

(American Psychological Association, 2021). Although some argue there is no one path to grief and we should not pathologize bereavement, the inclusion of PGD in the DSM-5 provides clinicians with a common language to describe issues with grief and provides an official diagnosis for insurance billing purposes.

What if rather than lasting too long, bereavement is brief? Previously, the assumption was sometimes made that something had to be wrong if a bereaved person showed only mild distress and moved on quickly from the death of a loved one. However, research suggests that over half of people can be classified as resilient (Mancini et al., 2011; Spahni et al., 2015). Moreover, resilience has been associated with positive outcomes, including reduced depression and loneliness and improved life satisfaction (Spahni et al., 2016). People who are resilient are generally low in neuroticism and high in extraversion (Mancini et al., 2015; Mancini et al., 2011). Secure attachment and an internal locus of control have also been associated with resilience (Laird et al., 2019). Older adults who are resilient also tend to have had prior experience with adversity (Seery, 2011). In other words, having had bad things happen to you and having overcome them successfully teaches you how to handle life's inevitable challenges more effectively.

The knowledge that grief takes varied forms and patterns has important implications for helping people deal with loss. Box 1 lists suggestions for helping those who have lost a loved one. It may be unnecessary and even harmful to expect mourners to follow a set pattern of emotional reactions. While bereavement therapy may help some people, the evidence suggests that many people will recover on their own if given time (Neimeyer & Currier, 2009).

## RESPONSES TO DEATH ACROSS THE LIFE SPAN

There is no single way of viewing death at any age. As the timing-of-events model suggests, death probably does not mean the same thing to an 85-year-old man with excruciatingly painful arthritis, a 56-year-old woman at the height of a brilliant legal career who discovers she has breast cancer, and a 15-year-old who dies of an overdose of drugs. Typical changes in attitudes toward death across the life span depend both on cognitive development and on the normative or nonnormative timing of the event.

**Infancy and Childhood** Death is challenging to understand, even for adults, and can be difficult to talk about. However, 1 in 7 children will be affected by the death of a family member by the age of 10 years (Torbic, 2011). In American samples, approximately 5 to 8 percent of children experience the death of a sibling (Fletcher et al., 2013). Moreover, as a result of the COVID-19 pandemic, from April 2020 to June 2021,

### checkpoint can you . . .

- Summarize changes that may occur in a person close to death?
- Cite possible explanations for near-death experiences?
- Name Kübler-Ross's five stages of confronting death, and tell why her work is controversial?
- Identify the stages commonly described as grief work, and discuss newer findings of variations in the grieving process?

# research in action

## CULTURAL INFLUENCES ON CHILDREN'S UNDERSTANDING OF DEATH

We typically think of death and bereavement as something experienced mostly by adults, but we often learn to deal with or are introduced to death during childhood and adolescence. Our attitudes about death and bereavement can stem from our environmental experiences and cultural attitudes and can continue into adulthood. For instance, urban environments typically consist of crowded cities packed with people, so city dwellers interact more with people and less with animals and nature, and therefore tend to see and/or deal more with violent or unnatural deaths.

Children raised in rural environments tend to have more experience with animals and nature (e.g., farming). Because of this, rural children often deal with death directly and view it as a natural occurrence or part of the life cycle, whereas urban children, who interact mostly with people, may view death as unnatural (Vlok & de Witt, 2012).

In addition to environmental influences, culture can also play a large role in the ways we deal with death and bereavement. Native Americans tend to have cultural connections with animals and the environment and may see death as sacred. As adults, they have fewer negative associations with death and may even view death as a positive experience, where

things that die have a way of returning to the earth (Bang, 2015).

In contrast, other cultures that do not view death as sacred or do not have cultural ties to the environment may view death differently. As an example, Black American children may be taught that death is final and that people go somewhere else (heaven or afterlife) after death (Bang, 2015).

Different cultures and other environmental influences, like our families and peers, can produce very different reactions to death and bereavement; however, these attitudes tend to be consistent and manifest in adulthood when dealing with death directly. Adults may be more equipped to deal with death and bereavement than children and adolescents, but the attitudes and behaviors learned during childhood will likely surface.



How has your environment and/or culture influenced how you view and handle death and bereavement? Can you think of any experiences where someone you know had different views about death and bereavement than your own?

approximately 140,000 American children lost a parent or grandparent caregiver. The risk of such a loss was higher in Hispanic, Black, and American Indian/Alaska Native populations (Hillis et al., 2021). Globally, the number of children losing a parent or caregiver rose by 90 percent from April to October of 2021, affecting approximately 5.2 million children (Unwin et al., 2022).

Generally, although many feel uncomfortable doing so, most parents begin to talk about death with their children at around the age of 3 years (Nguyen & Rosengren, 2004; Renaud et al., 2015). Learning about death involves understanding it is irreversible, universal (happens to everyone), nonfunctional (involves the cessation of all life function), and inevitable (Speece & Brent, 1984).

Children can better understand death if they are introduced to the concept at an early age and are encouraged to talk about it (see Research in Action). For example, the death of a pet or knowing another child who dies may provide an opportunity. Children's books (Malcom, 2011) and movies (Cox et al., 2005) can scaffold conversations about death, although movies, especially older ones, do not always adequately address emotional responses (Graham et al., 2018). Not surprisingly, children who have had experience with the death of a loved one have a more realistic view of death than children who have not experienced such an event (Bonoti et al., 2013; Hunter & Smith, 2008).

With respect to bereavement, if children are old enough to love, they are old enough to grieve. However, they may have difficulty expressing or understanding their grief. Like their understanding of death, this depends on cognitive and emotional develop-

ment. Infants and very young children may respond to the death of a parent initially with crying, despair, and, eventually, pathological detachment. They may show feeding or sleeping difficulties and constipation, and previously toilet-trained toddlers may wet the bed. Depression may manifest as irritation or somatic complaints such as stomachaches (Black, 1998).

By the age of 4, children build a partial understanding of the biological nature of death. For example, 3- to 5-year-old German and Shuar children from a rural Amazon region of Ecuador were told a story and then asked questions about a character that either got tired and went to sleep or was killed. The 3-year-olds rarely answered correctly when asked if the character in the story could move or be afraid, whereas children at the age of 4 had little problem doing so (Barrett & Behne, 2005). However, this understanding is incomplete. In another study, preschoolers and kindergarteners expressed knowledge that a dead mouse would never be alive again or grow up to be an old mouse, but 54 percent said the mouse might still need to eat. By age 7, 91 percent of the children were consistent in their knowledge that such biological processes as eating and drinking cease at death. Generally, children have mastered the biological understanding of death by about 10 years of age (Kenyon, 2001).

While much of the research on children's understanding of death has focused on their understanding of the cessation of biological processes, it is also the case that many adults believe in the afterlife and often explicitly teach their children about it within the context of religious instruction. Within the context of these beliefs, psychological processes are presumed to carry on after death. Thus, affirmative answers to questions about the persistence of thoughts, feelings, and desires after death are not necessarily reflective of immaturity (Harris, 2011). For instance, 5-year-old Vezo children from Madagascar often answered that a dead bird or man could continue to do things such as sit upright or see. By the age of 7, most children responded that a dead entity could perform none of these actions. But as they grew older, children and adolescents, like adults, were increasingly likely to respond that mental processes continued after death, even though biological processes ceased (Astuti & Harris, 2008). Similar findings have emerged in Spanish and British schoolchildren (Giménez & Harris, 2005; Hopkins, 2014).

Children sometimes express grief through anger, acting out, or refusing to acknowledge a death, as if the pretense a person is still alive will make it so (Table 1). They may be confused by adults' euphemisms: that someone "passed on" or that the family "lost" someone or that someone is "asleep" and will never awaken. Adjusting to loss is more difficult if a child had a troubled relationship with the person who died; if a surviving



*Children's confusion is related to their cognitive development. In the Piagetian framework discussed in other chapters, we learned that children have difficulty with abstract thought, so euphemisms used to describe death can be confusing to them.*

**TABLE 1** Manifestations of Grief in Children

Under 3 Years	3 to 5 Years	School-Age Children	Adolescents
Sadness	Increased activity	Deterioration of school performance due to loss of concentration, interest, and motivation	Depression
Fearfulness	Constipation	Crying spells	Somatic complaints
Loss of appetite	Soiling	Lying	Delinquent behavior
Failure to thrive	Bed-wetting	Stealing	Promiscuity
Sleep disturbance	Anger and temper tantrums	Nervousness	Suicide attempts
Social withdrawal	Out-of-control behavior	Abdominal pain	Dropping out of school
Developmental delay	Nightmares	Headaches	
Irritability	Crying spells	Listlessness	
Excessive crying		Fatigue	
Increased dependency			
Loss of speech			

Source: Adapted from AAP Committee on Psychosocial Aspects of Child and Family Health, 1992.

parent depends too much on the child; if the death was unexpected, especially if it was a murder or suicide; if the child has had previous behavioral or emotional problems; or if family and community support are lacking (Schonfeld et al., 2016).

Parents and other adult caregivers can help children deal with bereavement by explaining that death is final and inevitable and that they did not cause the death by their misbehavior or thoughts. Children need reassurance that they will continue to receive care from loving adults. It is usually advisable to make as few changes as possible in a child's environment, relationships, and daily activities; to answer questions simply and honestly; and to encourage the child to talk about their feelings and about the person who died (Schonfeld et al., 2016). Children may show their grief in short spurts and then return to their daily activities, but this does not mean they have recovered (Gao & Slaven, 2017).

**Adolescence** For adolescents, while they are capable of a mature understanding of death, it is not something they typically think much about unless they are directly faced with it. Most teens are at the beginning of their lives, and generally, their contact with death involves the death of a loved one rather than their own mortality.

In the event of a close death, teens benefit from talking about it, although support and assistance for them is not always present (Schonfeld et al., 2016). Often teens may turn to peers for such support (Dopp & Cain, 2012). At the same time teens must process their own grief, they are often also asked to take on more adult responsibilities, such as helping take care of younger siblings or providing emotional support to a surviving parent (Schonfeld et al., 2016). The bereavement process can lead to academic problems, especially for juniors and seniors in high school (Schonfeld & Quackenbush, 2010), and mental health issues, particularly depression, conduct disorder, and increased likelihood of substance abuse (Brent et al., 2009; Kaplow et al., 2010). Religiosity can provide a buffer for some of these processes. Bereaved teens who attend religious services more frequently or who use religion as a coping strategy are less likely to abuse substances and are more likely to have higher self-esteem and succeed academically than their less religious peers (Rooney et al., 2020).

Fortunately, much of the grief response in both children and adolescents declines over time. However, a subset of young people experience persistent or even increasing grief over time (Melhem et al., 2011). A meta-analysis showed that while the effect size was small to moderate, therapeutic interventions could have positive effects on the bereavement process that persisted over time. The most promising treatment approaches were musical therapy and brief psychotherapy (Rosner et al., 2010).

**Adulthood** Young adults are generally eager to live the lives they have been preparing for. If they are suddenly struck by a potentially fatal illness or injury, they are likely to be frustrated and angry. People who develop terminal illnesses in their twenties or thirties must face issues of death and dying at an age when they normally would be dealing with issues such as establishing an intimate relationship. Rather than having a long lifetime of losses as gradual preparation for the final loss of life, they find their entire world collapsing at once.

In middle age, most adults' bodies send them signals that they are not as young, agile, and hearty as they once were. More and more, they think about how many years they may have left and how to make the most of those years (Neugarten, 1967). Often—especially after the death of both parents—there is a new awareness of being the older generation or the next in line to die (Scharlach & Fredriksen, 1993). Middle-aged and older adults may prepare for death emotionally as well as in practical ways by making a will, planning their funerals, and discussing their wishes with family and friends.

Older adults may have mixed feelings about the prospect of dying. Some older adults give up on achieving unfulfilled goals. Others push harder to do what they can with life in the time they have left. Many try



*The unnecessary risks adolescents sometimes take can have tragic results.*

John Lund/Tiffany Schoepp/Blend Images LLC

to extend their remaining time by adopting healthier lifestyles or struggle to live even when they are profoundly ill (Cicirelli, 2002), sometimes using religion to allay anxiety (Krause et al., 2016). When they think or talk of their impending death, some older adults express fear or anxiety and worry about the effect their death will have on their loved ones (Missler et al., 2012). Generally, distress is greater when the discrepancy between how long they want to live and how long they think they have left is large (Cicirelli, 2006).

Try to imagine that you are terminally ill. What do you imagine your feelings would be? Would they be similar to or different from those described with reference to your age group?



## checkpoint can you...

- ▶ Discuss how people of different ages understand and cope with death and bereavement?

# Significant Losses

Especially difficult losses that may occur during adulthood are the deaths of a spouse, a parent, or a child. The loss of a potential offspring through miscarriage or stillbirth also can be painful but usually draws less social support.

## SURVIVING A SPOUSE

Because women tend to live longer than men and to be younger than their husbands, they are more likely to be widowed. They also tend to be widowed at an earlier age. Approximately 32 percent of US women, but only 11 percent of US men, lose their spouse by age 65 (Federal Interagency Forum on Aging-Related Statistics, 2020).

The stress of widowhood often affects physical and mental health. Bereavement has been associated with cognitive declines (Singham et al., 2021) and depression and anxiety (Kristiansen et al., 2019). Bereavement also entails higher risks of disability, drug use, insomnia, hospitalization, and even death. These reactions may range from fairly short and mild to extreme and long-lasting, sometimes even for years (Stroebe et al., 2007).

Death, too, becomes more likely after widowhood. A meta-analysis of mortality risk including data from over 500 million people showed that becoming a widowed person is associated with an increased risk of death, especially for men, and is similar across most regions of the world. The risk of either natural death or suicide is greatest in the early months after a loss and is higher for younger adults. Indeed, the disparity in the mortality risk for men versus women as a result of becoming widowed declines with age (Shor et al., 2012). Disparities also exist across race and ethnicity, with Hispanic men and women and Black women at higher risk (Liu et al., 2020).

Higher relationship quality during the marriage has been associated with an increased risk of cognitive decline, greater anger, more anxiety and depression, and feelings of yearning after the death of a spouse (Min & Song, 2020; Carr & Boerner, 2009; Schaan, 2013), presumably because those people happiest in their marriages had the most to lose. However, those people who are able to maintain healthy, secure attachments to other people in their lives and use them for social support after a spouse's death are likely to show more resilience (Mancini et al., 2015).

For women, the main consequences of widowhood are likely to be economic. In the United States, women show a 22 percent reduction in their income in the first two years following spousal death, whereas men's finances tend to remain relatively stable (Streeter, 2020). Research conducted in a number of low- and middle-income countries, including China, Ghana, India, Russia, and South Africa, mirrored these findings (Lloyd-Sherlock et al., 2015).

Widowed men are more likely to become socially isolated after the death of a spouse than are widows (Isherwood et al., 2017), in part because older widows are more likely than older widowers to stay in touch with friends from whom they receive social support (Kinsella & Velkoff, 2001). Older widows are also likely to have larger and more sup-



A belief in the afterlife can often comfort a grieving spouse. However, when widowed adults believe their deceased spouse still exists and yearn for them, these "continuing bonds" can become maladaptive and prevent widowed adults from engaging fully in life (Carr & Sharp, 2013).



*Older widows are more likely than older widowers to stay in touch with friends and benefit from the support of a social network.*

Richard Bailey/Photodisc/Getty Images

portive social networks than their married counterparts (Kang & Ahn, 2014), a response to spousal death likely contributing to resilience.

## LOSING A PARENT IN ADULTHOOD

The loss of a parent at any time is difficult, even in adulthood (Nickerson et al., 2013). The majority of bereaved adult children still show an impact on their well-being and experience emotional distress after 1 to 5 years, especially following loss of a mother and most strongly in daughters (Scharlach & Fredriksen, 1993; Leopold & Lechner, 2015). However, the death of a parent can also be a maturing experience. It can push adults into resolving important developmental issues: achieving a stronger sense of self and a more pressing, realistic awareness of their own mortality, along with a greater sense of purpose, responsibility, commitment, and interconnectedness to others (Pope, 2005; Sharlach & Fredriksen, 1993). It can also push middle-aged adults into reevaluating their relationships with their own grown children, a process that can increase the positive aspects of their relationships (Kim et al., 2018).

Still, the road may not be easy. Families with a history of conflict are more likely to engage in conflict when a parent is approaching death and important decisions must be made. When adult parents leave instructions for the type of medical treatment they desire at the end of life, this generally results in less stressful decision making for their children (Kramer & Boelk, 2015). However, regardless of the wishes of the dying parent, if siblings disagree on the treatment provided, this can damage their relationship (Su et al., 2014). Siblings are less likely to engage in conflict over end-of-life care when parents designate someone outside of the family as the person who will make decisions about such care (Khodyakov & Carr, 2009; Kramer et al., 2006).

The impact of a parent's death on siblings is equivocal. Some research suggests that following the death of a parent, siblings tend to grow less close. This may be because the link that bound them together in their adult life—a parent—is gone (Walker et al., 2005), or it may be because of conflict following parental death about such aspects as funeral arrangements or distribution of assets (Umberson, 2003). Other research suggests that parental death and the intense emotions that elicit may draw siblings closer (Aldwin & Levenson, 2001). A longitudinal approach may help explain these disparate findings. Research shows that sibling contact intensifies after a parent dies and then declines over time. Moreover, when the second parent dies, the effect is intensified once support is no longer needed for a surviving parent (Kalmijn & Leopold, 2019).

## LOSING A CHILD

A parent is rarely prepared for the death of a child. Such a death, no matter at what age, comes as a cruel, unnatural shock. The parents may feel they have failed, no matter how much they loved and cared for the child, and they may find it hard to let go.

Parents who have lost a child are at heightened risk of being depressed or hospitalized for mental illness and show poorer health-related quality of life (Youngblut et al., 2013; Song et al., 2010). The stress of a child's loss may even hasten a parent's death, most frequently via heart disease (Song et al., 2019; Rostila et al., 2012).

If a marriage is strong, the couple may draw closer, supporting each other in their shared loss. In other cases, the loss weakens and eventually destroys the marriage (Albuquerque et al., 2016; Lyngstad, 2013). One important factor appears to be whether or not parents grieve a similar amount. Parents who perceive that their spouse is grieving more or less than they are report less satisfaction in the relationship than those who perceive greater similarity in their pain (Buyukcan-Tetik et al., 2017).

The impact of parental bereavement may vary depending on a variety of factors. Grief rises with the age of a child (up to 17) and the age of a parent (up to 40) (Wijnngaards-deMeij et al., 2005; Moor & de Graaf, 2016). Parents whose child dies a traumatic

death generally grieve more than those whose child dies of an illness or disorder or those who experience a stillbirth or neonatal death, and mothers tend to grieve more than fathers (Wijngaards-deMeij et al., 2005; Meert et al., 2010). Those parents who are able to make some sense of the loss generally show less intense grief (Keesee et al., 2008). As time goes by, grief tends to diminish, especially among couples who became pregnant again (Wijngaards-deMeij et al., 2005). However, even decades later, most parents express lasting grief (Rogers et al., 2008).

Many parents hesitate to discuss a terminally ill child's impending death with the child, but those who do so tend to achieve a sense of closure that helps them cope after the loss. In one study, approximately one-third of the parents said they had talked with their children about their impending death, and none of these parents regretted having done so. When asked about what they did regret following their child's death, parents regretted not bringing the subject of death up, not spending time with their child, and agreeing to surgery and additional treatment for their child (Kreicbergs et al., 2004; Brooten et al., 2019).

When asked what most helped them cope with the end of their child's life, 73 percent of parents whose children died in intensive-care units gave religious or spiritual responses. They mentioned prayer, faith, discussions with clergy, or a belief that the parent-child relationship endures beyond death. Parents also said they were guided by insight and wisdom, inner values, and spiritual virtues such as hope, trust, and love (Robinson et al., 2006). Parents who used spiritual beliefs to help them cope with their child's death showed less grief, depression, and, for mothers, less posttraumatic stress and greater personal growth (Hawthorne et al., 2016). The comfort derived from religious beliefs appears to be more common in Black and Hispanic parents than in White parents (Brooten et al., 2015).

## MOURNING A MISCARRIAGE

Estimates are that somewhere around 1 in 3 pregnancies ends in miscarriage (Smith et al., 2003). Families, friends, and health professionals tend to avoid talking about such losses, which often are considered insignificant compared with the loss of a living child. Moreover, many couples do not tell others about their pregnancy until after the first trimester, during which miscarriage is most common. So, in many cases, friends and family members may not even realize support is needed (Brier, 2008). Grief can be more wrenching without social support.

How do prospective parents cope with the loss of a child they never knew? Common responses, which are generally reported with greater intensity in women, include grief, depression, guilt, isolation, and sadness (Huffman et al., 2015; Volgsten et al., 2018). Roughly a third meet the criteria for posttraumatic stress disorder (Farren et al., 2016). Generally, negative outcomes are even stronger when pregnancy losses are recurrent (Kolte et al., 2015) or there are no other children in the family (Tseng et al., 2017). Often, parents who have lost a child to miscarriage or stillbirth become pregnant again, frequently within 2 to 3 months after their loss (Plana-Ripoll et al., 2018).

Whether married or living together, couples who experience a miscarriage prior to 20 weeks of gestation are 22 percent more likely to break up than couples who have a successful pregnancy. When the miscarriage occurs after 20 weeks, that risk is elevated by as much as 40 percent (Gold et al., 2010).



Estimates are that each COVID-19 death in the United States will leave approximately nine bereaved relatives (Verdery et al., 2020).

### checkpoint can you . . .

- Identify specific challenges involved in losing a spouse?
- Discuss ways in which an adult's loss of a spouse or parent can be a maturing experience?
- Explain why parents are rarely prepared emotionally for the death of a child?
- Suggest ways to help expectant parents cope with the loss of a pregnancy?

## Medical, Legal, and Ethical Issues

Do people have a right to die? Should a terminally ill person who wants to commit suicide be allowed or helped to do so?

*Most people believe suicide terrorists are motivated by religious extremism. However, a small and controversial group of researchers argues that their motivation is, more simply, driven by the same desire to commit suicide and the same risk factors that have been found in other clinical populations (Lankford, 2010).*

## SUICIDE

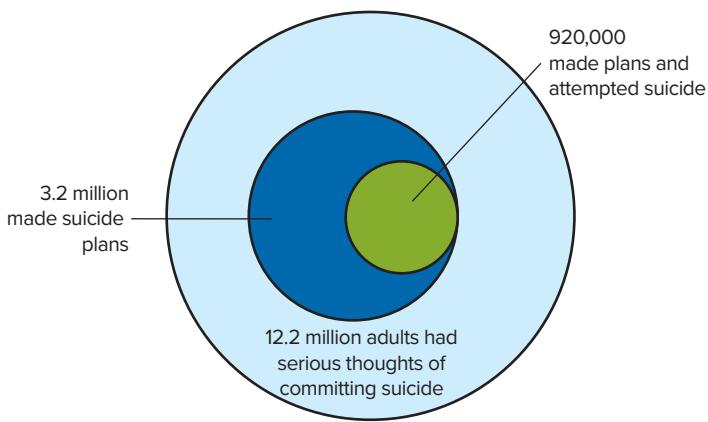
Although suicide is no longer a crime in most societies, there is still a stigma against it, based in part on religious prohibitions and in part on society's interest in preserving life. A person who expresses suicidal thoughts may be considered mentally ill, and the desire to die may be temporary and disappear when mental illness abates or circumstances change.

Suicide is a global issue. More than 703,000 people are lost to suicide every year, and more than 1 in every 100 deaths in 2019 was due to suicide. The most common methods used were ingestion of pesticides, hanging, and firearms. Men commit suicide at higher rates than do women. Suicide rates are also higher in stigmatized groups such as refugees, migrants, LGBTQ+ people, and prisoners. Low- and middle-income countries bear the brunt of the suicide burden, accounting for 77 percent of suicides, with higher suicide rates in African, European, and Southeast Asian countries (World Health Organization, 2021). Suicide rates in the United States have risen in recent years and are currently at 14.5 per 100,000 people. In 2019, slightly over 47,000 Americans committed suicide (Xu et al., 2021).

Statistics probably underestimate the number of suicides; many go unreported, and some (such as traffic "accidents" and "accidental" medicinal overdoses) are not recognized as such. Also, the figures on suicides often do not include suicide attempts; an estimated 20 to 60 percent of people in the United States who commit suicide have tried before, and about 10 percent of people who attempt suicide will kill themselves within 10 years (Harvard Medical School, 2003).

More than half of completed suicides are by gunshot, and gun deaths via suicide outnumber those by homicide (Xu et al., 2018). The rates of suicide using firearms are much higher in the United States than in other similar industrialized nations (Richardson & Hemenway, 2011), presumably because of easy access to firearms (Anglemyer et al., 2014). Suicide by suffocation has increased recently; approximately 1 in 4 suicides in 2014 was the result of suffocation (Curtin et al., 2016).

As in most nations, US suicide rates generally rise with age (see Table 2) and are higher among men than among women (Curtin et al., 2016; World Health Organization, 2021), though more women consider or attempt suicide (Figure 1). Young, unmarried women with little education and those who are unusually impulsive, anxious, or depressed are most at risk for suicidal thoughts and behavior (Nock et al., 2008). Historically, males were far more likely to succeed in taking their own life, but this gap has diminished in recent years. Men's suicide rates are higher mainly because they are far more likely to use reliable methods, such as firearms, whereas women are more likely to choose other means, such as poisoning or hanging.



**FIGURE 1**  
About 1.39 Million People Attempted Suicide in 2020

Source: Substance Abuse and Mental Health Services Administration (2021).

**TABLE 2** Changes in Suicide Rates by Age, United States, 1999–2016

SUICIDE RATE PER 100,000 PEOPLE		
Age Group	Rate in 2000	Rate in 2019
15 to 24	10.2	13.9
25 to 34	12.0	17.5
35 to 44	14.5	18.1
45 to 54	14.4	19.6
55 to 64	12.1	19.4
65 to 74	12.5	15.5
75 to 84	17.6	18.6
85 and over	19.6	20.1

Source: Xu et al. (2021).

## BOX 2 Preventing Suicide

### If Someone Threatens Suicide:

- Stay calm.
- Take the threat seriously.
- Don't leave the person alone. Prevent access to firearms, knives, medications, or any other item the person may use to commit suicide.
- Don't try to handle the situation alone. Call 911 or the local emergency response number. Phone the person's doctor, the police, a local crisis intervention team, or others who are trained to help.
- While waiting for help, listen closely to the person. Let the person know you're listening by maintaining eye contact, moving closer, or holding their hand, if appropriate.
- Ask questions to determine what method of suicide the person is considering and whether they have an organized plan.
- Remind the person that help is available.
- If the person does attempt suicide, immediately call for emergency medical assistance and administer first aid, if necessary.

Source: Adapted from American College of Emergency Physicians (2008).



People with a family member who committed suicide are more likely to feel guilty about the death than those with a family member who died of natural causes. Those feelings of guilt are, in turn, associated with elevated levels of depression, prolonged grief, and posttraumatic stress disorder (Wagner et al., 2020).

Suicide rates also vary along ethnic and racial lines. Native American and Alaskan Natives have the highest rates, at 22.4 per 100,000 people. They are followed by Whites (19), Native Hawaiian/Pacific Islanders (15.1), African Americans (7.6), Asians (7.1), and Hispanics (7.2) (Xu et al., 2021). Although some people intent on suicide carefully conceal their plans, most give warning signs (see Box 2).

While the death of a loved one is always difficult, survivors of people who take their own lives often walk an even more difficult road. Many blame themselves for failing to recognize the signs, and they suffer from feelings of guilt, shame, rejection, and isolation (Hanschmidt et al., 2016). Because of the stigma attached to suicide, these survivors often struggle with their emotions alone rather than share them with others who might understand (Schomerus et al., 2015).

## HASTENING DEATH

Medical technology has outpaced our legal system and ethics. Until recent decades, the idea of helping a suffering loved one hasten death was virtually unheard of. However, a growing number of people consider a mature adult's deliberate choice of a time to end their life a rational decision and a right to be defended, particularly when a loss of autonomy and dignity occurs or in the face of intractable pain and disability.

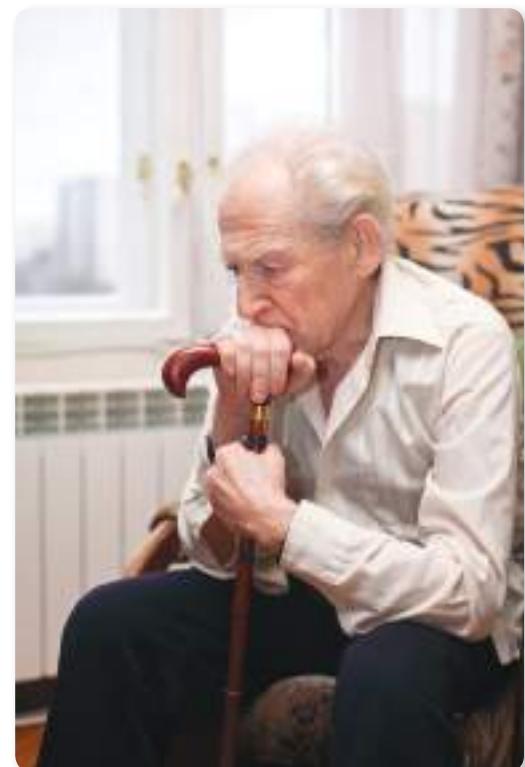
**Euthanasia** Euthanasia means "good death" and is intended to end suffering or to allow a terminally ill person to die with dignity. People differ in their beliefs about this process, and some draw distinctions between the types of euthanasia used. **Passive euthanasia** involves withholding or discontinuing treatment that might extend the life of a terminally ill patient, such as medication, life support systems, or feeding tubes. Many people would characterize turning off life support systems as passive euthanasia, although such cases are complicated by the fact that brain-dead people are considered legally dead even if their heart continues to beat. Passive euthanasia is generally legal. **Active euthanasia** (sometimes called mercy killing) involves action taken directly or deliberately to shorten a life, and it is generally illegal. An important question regarding either form of euthanasia is whether it is done at the direct request or to carry out the express wishes of the person whose death results.

### passive euthanasia

Withholding or discontinuation of life-prolonging treatment of a terminally ill person in order to end suffering or allow death with dignity.

### active euthanasia

Deliberate action taken to shorten the life of a terminally ill person in order to end suffering or to allow death with dignity; also called *mercy killing*.



The highest rate of suicide is among White men age 85 and older. Older people are more likely than younger people to be depressed and socially isolated.

Anna Lurye/Shutterstock

**Advance Directives** Some of the issues surrounding how much medical technology should be used to keep a person alive near the end of life can be addressed if people's wishes are made clear before they are incapacitated. The US Supreme Court held that a person whose wishes are clearly known has a constitutional right to refuse or discontinue life-sustaining treatment (*Cruzan v. Director, Missouri Department of Health*, 1990).

#### advance directive

Document specifying the type of care wanted by the maker in the event of an incapacitating or terminal illness.

Consider the situation in which an adult of sound mind writes an advance directive specifying their preferences for what should be done in the event they are incapacitated. What happens if the person later develops dementia and changes their mind? Should more moral weight be placed on the person's initial preferences or those developed after the onset of dementia? Why?



#### durable power of attorney

Legal instrument that appoints an individual to make decisions in the event of another person's incapacitation.

A mentally competent person's wishes can be spelled out in advance in a document called an **advance directive**, which contains instructions for when and how to discontinue futile medical care. All 50 states have since legalized some form of advance directive or adopted other provisions governing the making of end-of-life decisions. However, only about 37 percent of people report having written down their wishes for end-of-life care, and a review of past literature suggests this number has not changed significantly in the past 6 years (Yadav et al., 2017).

An advance directive may take the form of a living will. A living will may contain specific provisions with regard to circumstances in which treatment should be discontinued, what extraordinary measures, if any, should be taken to prolong life, and what kind of pain management is desired. A person also may specify, through a donor card or a signature on the back of their driver's license, that their organs be donated to someone in need of an organ transplant.

Some living will legislation applies only to terminally ill patients, not to those who are incapacitated by illness or injury but may live many years in severe pain. Thus, advance directives may not help the latter. Similarly, advance directives may not help patients in comas or persistent vegetative states. Such situations can be covered by a **durable power of attorney**, which appoints another person to make decisions if the maker of the document becomes incompetent to do so. A number of states have adopted a simple form known as a medical durable power of attorney expressly for decisions about health care.

As of August 2022, almost 106,000 people were waiting for an organ donation in the United States ([www.organdonor.gov](http://www.organdonor.gov)). Would you donate an organ to a friend or family member who needed it? To a stranger? Why or why not?



Advance care planning is beneficial not just to the dying person but also to the family. At the time of death, more than a quarter of elderly patients are incapable of making medical care decisions. This illustrates why, difficult as they may be, discussions about the end of life are important (Silveria et al., 2010). Having a plan of action when death is imminent leads to improved end-of-life care and results in higher levels of family satisfaction and reductions in stress, anxiety, and depression in family members of the terminally ill patient (Detering et al., 2010). They are also associated with decreased hospitalization rates, an increase in the use of preferred medical treatments, and a decrease in medical costs (Martin et al., 2016).

Unfortunately, even with advance planning, directives are not always followed. Often, they are unavailable during a crisis, or the wishes of the ill or dying adult are overruled in the moment (Perkins, 2007). Plans for end-of-life care are more likely to be followed if the decisions are made within the context of coordinated interventions where medical personnel, family members, and trained facilitators work together to determine a course of action (Brinkman-Stoppelenburg et al., 2014).

#### assisted suicide

Suicide in which a physician or someone else helps a person take their own life.

**Assisted Suicide** Assisted suicide—in which a physician or someone else helps a person bring about a self-inflicted death by, for example, prescribing or obtaining drugs or enabling a patient to inhale a deadly gas—commonly refers to situations in which people with incurable, terminal illnesses request help in ending their lives. Assisted suicide is still illegal in most places but in recent years has come to the forefront of public debate. It may be similar in principle to voluntary active euthanasia, in which, for example, a

patient asks for and receives a lethal injection, but in assisted suicide, the person who wants to die performs the actual deed.

Since 1997, when a unanimous US Supreme Court left regulation of physician aid-in-dying up to the states, measures to legalize assisted suicide for the terminally ill have been introduced in several states. Oregon was the first state to pass such a law, the Death with Dignity Act. In 1994, Oregonians voted to let mentally competent patients who have been told by two doctors that they have less than 6 months to live request a lethal prescription with strong safeguards to make sure the request is serious and voluntary and that all other alternatives have been considered.

The legalization of assisted suicide in Oregon has resulted in improvements of palliative care and an increased number of assisted suicide deaths occurring at home (95 percent) rather than in the hospital. From 1997 to 2021, 2,151 terminally ill patients took their lives, 238 of them in 2021. The concerns most frequently mentioned by patients who requested and used lethal prescriptions were loss of autonomy (93 percent), decreasing ability to participate in activities that made life enjoyable (92 percent), and loss of dignity (68 percent). The median age at death was 75 years, and most who chose to end their lives were White, well-educated, dying of cancer or heart disease, on hospice, and had some form of health insurance (Oregon Health Authority, 2022).

As of February 2022, assisted suicide is legal in 11 jurisdictions (California, Colorado, Hawaii, Montana, Maine, New Jersey, New Mexico, Oregon, Vermont, Washington, and the District of Columbia) (Death with Dignity, 2022). The American College of Physicians (Sulmasy & Mueller, 2017) and the American Medical Association (American Medical Association, 2018) oppose physician aid in dying as contrary to a practitioner's oath to "do no harm." The American Psychological Association takes no position, neither endorsing nor opposing assisted suicide (American Psychological Association, 2017). The American public is split with respect to the issue: 47 percent are in favor of laws to legalize assisted suicide, 49 percent are opposed (Duggan, 2014).

In the United States, support for physician-assisted suicide (PAS) varies widely, ranging from 47 to 69 percent, and it has remained essentially unchanged since the 1990s. Fewer than 20 percent of US physicians report receiving requests for PAS, and fewer than 5 percent have complied. Even in states such as Oregon and Washington, where such requests are legal, fewer than 1 percent of doctors write such prescriptions on a yearly basis (Emanuel et al., 2016).

Ethical arguments against assisted suicide center on two principles: (1) the belief that taking a life, even with consent, is wrong; and (2) concern for protection of the disadvantaged. Opponents of aid-in-dying point out that autonomy is often limited by poverty or disability or membership in a stigmatized social group, and they fear that persons in these categories may be subtly pressured into choosing suicide with cost containment as an underlying factor. Medical arguments against assisted suicide include the possibility of misdiagnosis, the potential future availability of new treatments, the likelihood of incorrect prognosis, and the beliefs that helping someone die is incompatible with a physician's role as healer and adequate safeguards are not possible. Legal arguments against assisted suicide include concerns about enforceability of safeguards and about lawsuits when family members disagree about the propriety of terminating a life (APA Online, 2001).

**International Variations in End-of-Life Decisions** Active euthanasia remains illegal in the United States but not in the Netherlands, where in 2002, a law permitting voluntary euthanasia for patients in a state of continuous, unbearable, and incurable suffering went into effect. In such cases, doctors can now inject a lethal dose of medication. Estimates are that somewhere around 1.8 to 2.9 percent of deaths in the Netherlands result from euthanasia or assisted suicide (Steck et al., 2013). In addition to the Netherlands, euthanasia or physician-assisted suicide is also legal in Belgium, Canada, Colombia, and Luxembourg.

In September 1996, a 66-year-old Australian man with advanced prostate cancer was the first person to die legally by assisted suicide.



Author Aldous Huxley, best known for his dystopian novel *Brave New World*, died while high on an intramuscular injection of LSD, administered to him by his wife, at his request.



The majority of PAS cases involve patients with cancer, typically older and well-educated. Although euthanasia and PAS have become increasingly legalized, fears of a “slippery slope” appear to be unfounded. In no areas, including the United States, do data indicate that vulnerable patients such as the disabled have been receiving physician-assisted suicide or euthanasia at higher rates than the general population (Radbruch et al., 2016; Emanuel et al., 2016).

The first representative study of end-of-life decisions in six European countries (Belgium, Denmark, Italy, the Netherlands, Sweden, and Switzerland) found important cultural differences. In all six countries, physicians reported withholding or withdrawing life-prolonging treatment—most typically medication, followed by hydration or nutrition—but the frequency varied greatly, from 41 percent of deaths in Switzerland to 6 percent in Italy (Bosshard et al., 2005). Active forms of physician-assisted death were most prevalent in the Netherlands and Belgium (van der Heide et al., 2003). In a later survey of physicians in the same six countries, direct physician-assisted deaths were rare, but in one-quarter to one-half of all deaths (23 percent in Italy, 51 percent in Switzerland), physicians made death-hastening decisions, such as deep sedation, sometimes accompanied by withdrawal of artificial nutrition and hydration (Bilsen et al., 2007).

Religion is an important factor. For example, British medical students' attitudes are colored by their religious beliefs. While most students did not condone physician-assisted suicide, this was particularly true for those students who believed in a god and particularly so if they were Muslim (Pomfret et al., 2018). In the United States, religiosity has also been associated with less support for PAS (Bulmer et al., 2017). More broadly, this same relationship can also be found on a countrywide level, with more religious countries generally being less accepting of PAS than less religious countries (Stack & Kposowa, 2011; Verbakel & Jaspers, 2010). Indeed, there are suggestions that declines in religiosity are tied to the growing public support for active euthanasia in Western Europe. Similarly, increases in religiosity are related to declining support in Central and Eastern Europe, particularly in post-communist Eastern Europe (Emanuel et al., 2016).

One beneficial result of the aid-in-dying controversy has been to call attention to the need for better palliative care and closer attention to patients' motivation and state of mind. When doctors talk openly with patients about their physical and mental symptoms, their expectations, their fears and goals, their options for end-of-life care, their family concerns, and their need for meaning and quality of life, ways may be found to diminish these concerns without the taking of life (Bascom & Tolle, 2002).

**End-of-Life Options and Diversity Concerns** In the United States, with its ethnically diverse population, issues of social and cultural diversity need to be addressed in end-of-life decision making. Beliefs about the morality of assisted suicide vary with respect to a number of demographic variables. Race and ethnicity matter; Whites are more likely (65 percent) to support the morality of assisted suicide than Hispanics (58 percent) and African Americans (52 percent). As discussed earlier, religion also plays a major role. Only 43 percent of White Evangelicals and Black Protestants agree on the morality of suicide in the event of intractable pain. By contrast, White mainline Protestants (71 percent), Catholics (63 percent), and religiously unaffiliated adults (85 percent) believe it is a moral right. Most Americans—roughly 62 percent—support a terminally ill person's right to end their own life, and approximately 66 percent agree that there are some circumstances in which a person should be allowed to die. Only 31 percent of Americans believe everything possible should always be done to save the life of a patient (Pew Research Center, 2013).

Cultural background also matters. Planning for death is inconsistent with traditional Navajo values, which avoid negative thinking and talk. Chinese families may try to protect a dying person from knowledge of their impending death. Recent Mexican or Korean immigrants may believe less in individual autonomy than does the dominant US culture (APA Working Group on Assisted Suicide, 2005). Among some ethnic

minorities, the value of longevity may take priority over health. Both African Americans and Hispanics are more likely than Whites to report they would prefer life-sustaining treatment even if they had an incurable disease and were in a great deal of pain (Lipka, 2014).

Issues of hastening death will become more pressing as the population ages. In years to come, both the courts and the public will be forced to come to terms with these issues as increasing numbers of people claim a right to die with dignity and with help.

## Finding Meaning and Purpose in Life and Death

The struggle to find meaning in life and in death—often dramatized in books and movies—has been borne out by research. Studies examining religion and death have found that such beliefs are generally beneficial for the dying (Edmondson et al., 2008). According to Kübler-Ross (1975), facing the reality of death is a key to living a meaningful life:

It is the denial of death that is partially responsible for [people] living empty, purposeless lives; for when you live as if you'll live forever, it becomes too easy to postpone the things you know that you must do. In contrast, when you fully understand that each day you awaken could be the last you have, you take the time that day to grow, to become more of who you really are, to reach out to other human beings. (p. 164)

### LIFE REVIEW

**Life review** is a process of reminiscence that enables a person to see the significance of their life. Life review can occur at any time. However, it may have special meaning in old age, when it can foster ego integrity—according to Erikson, the final critical task of the life span. As the end of their journey approaches, people may look back over their accomplishments and failures and ask themselves what their lives have meant. Awareness of mortality may be an impetus for reexamining values and seeing one's experiences and actions in a new light. Some people find the will to complete unfinished tasks, such as reconciling with estranged family members or friends, and thus to achieve a satisfying sense of closure.

Life review therapy and reminiscence interventions can help focus the natural process of life review and make it more conscious, purposeful, and efficient (Westerhof & Bohlmeijer, 2014; Lewis & Butler, 1974). Such interventions have been shown to reduce symptoms of depression and result in greater ego integrity (Pinquart & Forstmeier, 2012). Moreover, meta-analyses show a relationship between the use of life review therapy and quality of life across a number of different countries (Huang et al., 2020). Methods often used for uncovering memories in life review therapy include recording an autobiography; constructing a family tree; spending time with scrapbooks, photo albums, old letters, and other memorabilia; making a trip back to scenes of childhood and young adulthood; reuniting with former classmates or colleagues or distant family members; describing ethnic traditions; and summing up one's life's work.



- Explain why intent to commit suicide is sometimes not recognized and list warning signs?
- Discuss the ethical, practical, and legal issues involved in advance directives, euthanasia, and assisted suicide?

#### life review

Reminiscence about one's life in order to see its significance.



*Sharing memories evoked by a photo album is one way to review a life. Life review can help people recall important events and can motivate them to rebuild damaged relationships or complete unfinished tasks.*  
VCG/Corbis/Getty Images

## checkpoint can you ...

- Explain why life review can be especially helpful in old age and how it can help overcome fear of death?
- List several activities used in life review therapy?
- Explain how dying can be a developmental experience?

## DEVELOPMENT: A LIFELONG PROCESS

On April 17, 1955, the brilliant scientist Albert Einstein experienced a painful sensation in his midsection. Grabbing the draft of a speech he was working on—which he would never complete—he was taken to a local hospital and diagnosed with a painful abdominal aortic aneurysm. Einstein refused surgery, saying, “I want to go when I want. It is tasteless to prolong life artificially. I have done my share; it is time to go. I will do it elegantly.” He died a day later.

While we may vary in our ability to accept death, Einstein’s view of life is worthy of admiration. In his words, “The ideals which have always shone before me and filled me with the joy of living are goodness, beauty, and truth” (Calaprice et al., 2015).

Time is relative. When we are young, the wide swath of the future stretches ahead. Near death, the end contracts and narrows. Within a limited life span, no person can realize all capabilities, gratify all desires, explore all interests, or experience all the richness that life has to offer. The tension between the possibilities for growth and a finite time in which to do the growing defines human life. By choosing which possibilities to pursue and by continuing to follow them as far as possible, each person contributes to the unfinished story of human development.

## summary and key terms

### The Meaning of Death and Dying

- Death has biological, social, cultural, historical, religious, legal, psychological, developmental, medical, and ethical aspects.
- Customs surrounding death and mourning vary greatly from one culture to another, depending on the society’s view of the nature and consequences of death. Some modern customs have evolved from ancient beliefs and practices.
- Death rates dropped drastically during the twentieth century, especially in developed countries.
- Nearly three-quarters of deaths in the United States occur among the elderly, and the top causes of death are diseases that primarily affect older adults.
- As death became primarily a phenomenon of late adulthood, it became largely “invisible,” and care of the dying took place in isolation, by professionals.
- There is now an upsurge of interest in understanding and dealing realistically and compassionately with death. Examples of this tendency are a growing interest in thanatology and increasing emphasis on hospice care and palliative, or comfort, care.

**thanatology** (555)

### Facing Death and Loss

- People often undergo cognitive and functional declines shortly before death.
- Some people who come close to dying have “near-death” experiences that may result from physiological changes.
- Elisabeth Kübler-Ross proposed five stages in coming to terms with dying: denial, anger, bargaining, depression, and acceptance. These stages, and their sequence, are not universal.
- There is no universal pattern of grief. The most widely studied pattern moves from shock and disbelief to preoccupation with the memory of the dead person and finally to resolution. However, research has found wide variations and a prevalence of resilience.
- Children’s understanding of death develops gradually. Young children can better understand death if it is part of their own experience. Children show grief in age-related ways based on cognitive and emotional development.
- Although adolescents generally do not think much about death, violence and the threat of death are part of some adolescents’ daily life. Adolescents tend to take needless risks.
- Realization and acceptance of the inevitability of death increases throughout adulthood.

**terminal drop** (555)

**hospice care** (556)

**palliative care** (556)

**grief** (558)

**bereavement** (558)

**grief work** (558)

## Significant Losses

- Women are more likely to be widowed, and widowed younger, than men and may experience widowhood somewhat differently. Physical and mental health tend to decline after widowhood, but for some people, widowhood can ultimately become a positive developmental experience.
- Death of a parent can precipitate changes in the self and in relationships with others.
- The loss of a child can be especially difficult because it is no longer normative.
- Because miscarriage and stillbirth are not generally considered significant losses in US society, those who experience such losses are often left to deal with them with little social support.

## Medical, Legal, and Ethical Issues

- Although suicide is no longer illegal in modern societies, there is still a stigma attached to it. Some people maintain a “right to die,” especially for people with long-term, degenerative illness.
- The number of suicides is probably underestimated. It is often related to depression, isolation, family conflict, financial troubles, and debilitating ailments. There are many more suicide attempts than actual deaths.
- Euthanasia and assisted suicide involve controversial ethical, medical, and legal issues.

- To avoid unnecessary suffering through artificial prolongation of life, passive euthanasia is generally permitted with the patient’s consent or with advance directives. However, such directives are not consistently followed. Most hospitals now have ethics committees to deal with decisions about end-of-life care.
- Active euthanasia and assisted suicide are generally illegal, but public support for physician aid-in-dying has increased.
- The aid-in-dying controversy has focused more attention on the need for better palliative care and understanding of patients’ state of mind. Issues of social and cultural diversity need to be considered.

**passive euthanasia** (567)

**active euthanasia** (567)

**advance directive** (568)

**durable power of attorney** (568)

**assisted suicide** (568)

## Finding Meaning and Purpose in Life and Death

- The more meaning and purpose people find in their lives, the less they tend to fear death.
- Life review can help people prepare for death and give them a last chance to complete unfinished tasks.
- Even dying can be a developmental experience.

**life review** (571)



# glossary

**acceleration programs** Programs for educating the gifted that move them through the curriculum at an unusually rapid pace.

**accommodation** Piaget's term for changes in a cognitive structure to include new information.

**acquired immune deficiency syndrome (AIDS)** Viral disease that undermines effective functioning of the immune system.

**active euthanasia** Deliberate action taken to shorten the life of a terminally ill person in order to end suffering or to allow death with dignity; also called *mercy killing*.

**activities of daily living (ADLs)** Essential activities that support survival, such as eating, dressing, bathing, and getting around the house.

**activity theory** Theory of aging that holds that to age successfully, a person must remain as active as possible.

**acute medical conditions** Illnesses that last a short time.

**adaptation** Piaget's term for adjustment to new information about the environment, achieved through processes of assimilation and accommodation.

**adolescence** Developmental transition between childhood and adulthood entailing major physical, cognitive, and psychosocial changes.

**adolescent growth spurt** Sharp increase in height and weight that precedes sexual maturity.

**adolescent rebellion** Pattern of emotional turmoil, characteristic of a minority of adolescents, that may involve conflict with family, alienation from adult society, reckless behavior, and rejection of adult values.

**advance directive** Document specifying the type of care wanted by the maker in the event of an incapacitating or terminal illness.

**ageism** Prejudice or discrimination against a person (most commonly an older person) based on age.

**age-related macular degeneration** Condition in which the center of the retina gradually loses its ability to discern fine details; leading cause of irreversible visual impairment in older adults.

**aging in place** Remaining in one's own home, with or without assistance, in later life.

**alcoholism** Chronic disease involving dependence on use of alcohol, causing interference with normal functioning and fulfillment of obligations.

**alleles** Two or more alternative forms of a gene that occupy the same position on paired chromosomes and affect the same trait.

**altruistic behavior** Activity intended to help another person with no expectation of reward.

**Alzheimer's disease** Progressive, irreversible, degenerative brain disorder characterized by cognitive deterioration and loss of control of bodily functions, leading to death.

**ambivalent (resistant) attachment** Pattern in which an infant becomes anxious before the primary caregiver leaves, is extremely upset during their absence, and both seeks and resists contact on their return.

**amyloid plaque** Waxy chunks of insoluble tissue found in brains of persons with Alzheimer's disease.

**animism** Tendency to attribute life to objects that are not alive.

**anorexia nervosa** Eating disorder characterized by self-starvation.

**anoxia** Lack of oxygen, which may cause brain damage.

**anticipatory smiling** Infant smiles at an object and then gazes at an adult while still smiling.

**Apgar scale** Standard measurement of a newborn's condition; it assesses appearance, pulse, grimace, activity, and respiration.

**art therapy** Therapeutic approach that allows a person to express troubled feelings without words, using a variety of art materials and media.

**assimilation** Piaget's term for incorporation of new information into an existing cognitive structure.

**assisted reproductive technology (ART)** Methods used to achieve conception through artificial means.

**assisted suicide** Suicide in which a physician or someone else helps a person take their own life.

**asthma** A chronic respiratory disease characterized by sudden attacks of coughing, wheezing, and difficulty in breathing.

**attachment** Reciprocal, enduring tie between two people—especially between infant and caregiver—each of whom contributes to the quality of the relationship.

**attention-deficit/hyperactivity disorder (ADHD)** Syndrome characterized by persistent inattention and distractibility, impulsivity, low tolerance for frustration, and inappropriate overactivity.

**authoritarian parenting** In Baumrind's terminology, parenting style emphasizing control and obedience.

**authoritative parenting** In Baumrind's terminology, parenting style blending respect for a child's individuality with an effort to instill social values.

**autobiographical memory** Memory of specific events in one's life.

**autonomy versus shame and doubt** Erikson's second stage in psychosocial development, in which children achieve a balance between self-determination and control by others.

**autosomes** In humans, the 22 pairs of chromosomes not related to sexual expression.

**avoidant attachment** Pattern in which an infant rarely cries when separated from the primary caregiver and avoids contact on their return.

**basal metabolism** Use of energy to maintain vital functions.

**basic sense of trust versus mistrust** Erikson's first stage in psychosocial development, in which infants develop a sense of the reliability of people and objects.

**Bayley Scales of Infant and Toddler Development** Standardized test of infants' and toddlers' mental and motor development.

**behavior therapy** Therapeutic approach using principles of learning theory to encourage desired behaviors or eliminate undesired ones; also called *behavior modification*.

**behavioral genetics** Quantitative study of relative hereditary and environmental influences on behavior.

<b>behaviorism</b> Learning theory that emphasizes the predictable role of environment in causing observable behavior.	<b>cell death</b> In brain development, normal elimination of excess brain cells to achieve more efficient functioning.	coping strategies to deal with situations that tax their normal resources.
<b>behaviorist approach</b> Approach to the study of cognitive development that is concerned with basic mechanics of learning.	<b>central executive</b> In Baddeley's model, element of working memory that controls the processing of information.	<b>cognitive development</b> pattern of change in mental abilities, such as learning, attention, memory, language, thinking, reasoning, and creativity.
<b>bereavement</b> Response to the loss, due to death, of someone to whom one feels close and the process of adjustment to the loss.	<b>central nervous system</b> Brain and spinal cord.	<b>cognitive neuroscience</b> Study of links between neural processes and cognitive abilities.
<b>bilingual</b> Fluent in two languages.	<b>centration</b> In Piaget's theory, the tendency of preoperational children to focus on one aspect of a situation and neglect others.	<b>cognitive neuroscience approach</b> Approach to the study of cognitive development that links brain processes with cognitive ones.
<b>bilingual education</b> System of teaching non-English-speaking children in their native language while they learn English and later switching to all-English instruction.	<b>cephalocaudal principle</b> Principle that development proceeds in a head-to-tail direction; that is, that upper parts of the body develop before lower parts of the trunk.	<b>cognitive perspective</b> View that thought processes are central to development.
<b>binge drinking</b> Consuming five or more drinks (for men) or four or more drinks (for women) on one occasion.	<b>cesarean delivery</b> Delivery of a baby by surgical removal from the uterus.	<b>cognitive reserve</b> Hypothesized fund of energy that may enable a deteriorating brain to continue to function normally.
<b>binge eating disorder</b> Eating disorder in which a person loses control over eating and binges huge quantities of food.	<b>child-directed speech (CDS)</b> Form of speech often used in talking to babies or toddlers; includes slow, simplified speech, a high-pitched tone, exaggerated vowel sounds, short words and sentences, and much repetition; also called <i>parentese</i> or <i>motherese</i> .	<b>cognitive-stage theory</b> Piaget's theory that children's cognitive development advances in a series of four stages involving qualitatively distinct types of mental operations.
<b>bioecological theory</b> Bronfenbrenner's approach to understanding processes and contexts of human development that identifies five levels of environmental influence.	<b>childhood depression</b> Mood disorder characterized by such symptoms as a prolonged sense of friendlessness, inability to have fun or concentrate, fatigue, extreme activity or apathy, feelings of worthlessness, weight change, physical complaints, and thoughts of death or suicide.	<b>cohort</b> A group of people born at about the same time.
<b>BIPOC</b> Acronym standing for Black, indigenous and people of color.	<b>chromosomes</b> Coils of DNA that consist of genes.	<b>collectivistic culture</b> A culture in which people tend to prioritize collaborative social goals ahead of individual goals and to view themselves in the context of their social relationships.
<b>Black Lives Matter</b> A political and social movement focused on eliminating racially based violence against Black people through nonviolent protest and activism.	<b>chronic medical conditions</b> Illnesses or impairments that persist for at least 3 months.	<b>commitment</b> Marcia's term for personal investment in an occupation or system of beliefs.
<b>body image</b> Descriptive and evaluative beliefs about one's appearance.	<b>circular reactions</b> Piaget's term for processes by which an infant learns to reproduce desired occurrences originally discovered by chance.	<b>committed compliance</b> Kochanska's term for wholehearted obedience of a parent's orders without reminders or lapses.
<b>Brazelton Neonatal Behavioral Assessment Scale (NBAS)</b> Neurological and behavioral test to measure neonate's responses to the environment.	<b>classical conditioning</b> Learning based on associating a stimulus that does not ordinarily elicit a response with another stimulus that does elicit the response.	<b>componential element</b> Sternberg's term for the analytic aspect of intelligence.
<b>bulimia nervosa</b> Eating disorder in which a person regularly eats huge quantities of food and then purges the body by laxatives, induced vomiting, fasting, or excessive exercise.	<b>class inclusion</b> Understanding of the relationship between a whole and its parts.	<b>concordant</b> Term describing tendency of twins to share the same trait or disorder.
<b>bullying</b> Aggression deliberately and persistently directed against a particular target, or victim, typically one who is weak, vulnerable, and defenseless.	<b>code mixing</b> Use of elements of two languages, sometimes in the same utterance, by young children in households where both languages are spoken.	<b>concrete operations</b> Third stage of Piagetian cognitive development (approximately ages 7 to 12), during which children develop logical but not abstract thinking.
<b>canalization</b> Limitation on variance of expression of certain inherited characteristics.	<b>code switching</b> Changing one's speech to match the situation, as in people who are bilingual.	<b>conduct disorder (CD)</b> Repetitive, persistent pattern of aggressive, antisocial behavior violating societal norms or the rights of others.
<b>caregiver burnout</b> Condition of physical, mental, and emotional exhaustion affecting adults who provide continuous care for sick or aged persons.	<b>cognitive-appraisal model</b> Model of coping, proposed by Lazarus and Folkman, that holds that, on the basis of continuous appraisal of their relationship with the environment, people choose appropriate	<b>conscience</b> Internal standards of behavior, which usually control one's conduct and produce emotional discomfort when violated.
<b>case study</b> Study of a single subject, such as an individual or family.		<b>conservation</b> Piaget's term for awareness that two objects that are equal according to a certain measure remain equal in the face of perceptual alteration so long as nothing has been added to or taken away from either object.
<b>cataracts</b> Cloudy or opaque areas in the lens of the eye, which cause blurred vision.		<b>constructive play</b> Play involving use of objects or materials to make something.

**contextual element** Sternberg's term for the practical aspect of intelligence.

**contextual perspective** View of human development that sees the individual as inseparable from the social context.

**continuity theory** Theory of aging, described by Atchley, that holds that in order to age successfully, people must maintain a balance of continuity and change in both the internal and external structures of their lives.

**control group** In an experiment, a group of people, similar to those in the experimental group, who do not receive the treatment under study.

**conventional morality (or morality of conventional role conformity)** Second level in Kohlberg's theory of moral reasoning in which standards of authority figures are internalized.

**convergent thinking** Thinking aimed at finding the one right answer to a problem.

**coping** Adaptive thinking or behavior aimed at reducing or relieving stress that arises from harmful, threatening, or challenging conditions.

**coregulation** Transitional stage in the control of behavior in which parents exercise general supervision and children exercise moment-to-moment self-regulation.

**coronaviruses** A large family of respiratory viruses, including those that cause the common cold, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and COVID-19.

**corporal punishment** Use of physical force with the intention of causing pain, but not injury, so as to correct or control behavior.

**correlational study** Research design intended to discover whether a statistical relationship between variables exists.

**COVID-19** A novel coronavirus disease causing fatigue, loss of sense of smell, fever, and respiratory distress; the source of the 2019 pandemic.

**creativity** Ability to see situations in a new way, to produce innovations, or to discern previously unidentified problems and find novel solutions.

**crisis** Marcia's term for period of conscious decision making related to identity formation.

**critical period** Specific time when a given event or its absence has a specific impact on development.

**cross-modal transfer** Ability to use information gained by one sense to guide another.

**cross-sectional study** Study designed to assess age-related differences, in which

people of different ages are assessed on one occasion.

**crystallized intelligence** Type of intelligence, proposed by Horn and Cattell, involving the ability to remember and use learned information; it is largely dependent on education and culture.

**cultural socialization** Parental practices that teach children about their racial/ethnic heritage and promote cultural practices and cultural pride.

**culture** A society's or group's total way of life, including customs, traditions, beliefs, values, language, and physical products—all learned behavior, passed on from parents to children.

**culture-fair tests** Intelligence tests that deal with experiences common to various cultures, in an attempt to avoid cultural bias.

**culture-free tests** Intelligence tests that, if they were possible to design, would have no culturally linked content.

**decenter** In Piaget's terminology, to think simultaneously about several aspects of a situation.

**decoding** Process of phonetic analysis by which a printed word is converted to spoken form before retrieval from long-term memory.

**deductive reasoning** Type of logical reasoning that moves from a general premise about a class to a conclusion about a particular member or members of the class.

**deferred imitation** Piaget's term for reproduction of an observed behavior after the passage of time by calling up a stored symbol of it.

**dementia** Deterioration in cognitive and behavioral functioning due to physiological causes.

**dental caries** Tooth decay, cavities.

**Denver Developmental Screening Test** Screening test given to children 1 month to 6 years old to determine whether they are developing normally.

**deoxyribonucleic acid (DNA)** Chemical that carries inherited instructions for the development of all cellular forms of life.

**dependent variable** In an experiment, the condition that may or may not change as a result of changes in the independent variable.

**depth perception** Ability to perceive objects and surfaces three-dimensionally.

**diabetes** (1) One of the most common diseases of childhood. It is characterized by high levels of glucose in the blood as a result of defective insulin production, ineffective insulin action, or both. (2) Disease in which the body does not

produce or properly use insulin, a hormone that converts sugar, starches, and other foods into energy needed for daily life.

**differentiation** Process by which cells acquire specialized structures and functions.

**"difficult" children** Children with irritable temperament, irregular biological rhythms, and intense emotional responses.

**disability** Any mental or physical condition making it difficult for a person to do certain activities and interact with the world around them.

**discipline** Methods of molding children's character and of teaching them to exercise self-control and engage in acceptable behavior.

**disengagement theory** Theory of aging that holds that successful aging is characterized by mutual withdrawal of the older person and society.

**dishabituation** Increase in responsiveness after presentation of a new stimulus.

**disorganized-disoriented attachment** Pattern in which an infant, after separation from the primary caregiver, shows contradictory, repetitious, or misdirected behaviors on their return.

**divergent thinking** Thinking that produces a variety of fresh, diverse possibilities.

**dizygotic twins** Twins conceived by the union of two different ova (or a single ovum that has split) with two different sperm cells; also called *fraternal twins*; they are no more alike genetically than any other siblings.

**dominant inheritance** Pattern of inheritance in which, when a child receives different alleles, only the dominant one is expressed.

**doula** An experienced mentor who furnishes emotional support and information for a woman during labor.

**Down syndrome** Chromosomal disorder characterized by moderate-to-severe mental retardation and by such physical signs as a downward-sloping skin fold at the inner corners of the eyes. Also called *trisomy-21*.

**dramatic play** Play involving imaginary people or situations; also called *pretend play, fantasy play, or imaginative play*.

**drug therapy** Administration of drugs to treat emotional disorders.

**dual representation hypothesis** Proposal that children under age 3 have difficulty grasping spatial relationships because of the need to keep more than one mental representation in mind at the same time.

**durable power of attorney** Legal instrument that appoints an individual to make

decisions in the event of another person's incapacitation.

**dynamic systems theory (DST)** Esther Thelen's theory, which holds that motor development is a dynamic process of active coordination of multiple systems within the infant in relation to the environment.

**dynamic tests** Tests based on Vygotsky's theory that emphasize potential rather than past learning.

**dyslexia** Developmental disorder in which reading achievement is substantially lower than predicted by IQ or age.

**early intervention** Systematic process of providing services to help families meet young children's developmental needs.

**"easy" children** Children with a generally happy temperament, regular biological rhythms, and a readiness to accept new experiences.

**ecological theory of perception** Theory developed by Eleanor and James Gibson, which describes developing motor and perceptual abilities as interdependent parts of a functional system that guides behavior in varying contexts.

**egocentrism** Piaget's term for inability to consider another person's point of view; a characteristic of young children's thought.

**ego control** Self-control and the self-regulation of impulses.

**ego integrity versus despair** According to Erikson, the eighth and final stage of psychosocial development, in which people in late adulthood either achieve a sense of integrity of the self by accepting the lives they have lived, and thus accept death, or yield to despair that their lives cannot be relived.

**ego resiliency** (1) Dynamic capacity to modify one's level of ego-control in response to environmental and contextual influences. (2) The ability to adapt flexibly and resourcefully to potential sources of stress.

**elaboration** Mnemonic strategy of making mental associations involving items to be remembered.

**electronic fetal monitoring** Mechanical monitoring of fetal heartbeat during labor and delivery.

**embryonic stage** Second stage of gestation (2 to 8 weeks), characterized by rapid growth and development of major body systems and organs.

**emergent literacy** Preschoolers' development of skills, knowledge, and attitudes that underlie reading and writing.

**emerging adulthood** Proposed transitional period between adolescence and adulthood commonly found in industrialized countries.

**emotional intelligence (EI)** Salovey and Mayer's term for the ability to understand and regulate emotions; an important component of effective, intelligent behavior.

**emotional maltreatment** Rejection, terrorization, isolation, exploitation, degradation, ridicule, or failure to provide emotional support, love, and affection; or other action or inaction that may cause behavioral, cognitive, emotional, or mental disorders.

**emotion-focused coping** In the cognitive-appraisal model, coping strategy directed toward managing the emotional response to a stressful situation so as to lessen its physical or psychological impact.

**emotions** Subjective reactions to experience that are associated with physiological and behavioral changes.

**empathy** Ability to put oneself in another person's place and feel what the other person feels.

**empty nest** Transitional phase of parenting following the last child's leaving the parents' home.

**encapsulation** In Hoyer's terminology, the process that allows expertise to compensate for declines in information-processing ability by bundling relevant knowledge together.

**encoding** Process by which information is prepared for long-term storage and later retrieval.

**English-immersion approach** Approach to teaching English as a second language in which instruction is presented only in English.

**enrichment programs** Programs for educating the gifted that broaden and deepen knowledge and skills through extra activities, projects, field trips, or mentoring.

**enuresis** Repeated urination in clothing or in bed.

**environment** Totality of nonhereditary, or experiential, influences on development.

**epigenesis** Mechanism that turns genes on or off and determines functions of body cells.

**episodic memory** Long-term memory of specific experiences or events, linked to time and place.

**equilibration** Piaget's term for the tendency to seek a stable balance among cognitive elements; achieved through a balance between assimilation and accommodation.

**erectile dysfunction** Inability of a man to achieve or maintain an erect penis sufficient for satisfactory sexual performance.

**ethnic gloss** Overgeneralization about an ethnic or cultural group that obscures differences within the group.

**ethnic group** A group united by ancestry, race, religion, language, or national origins, which contribute to a sense of shared identity.

**ethnic minorities** Ethnic groups with national or cultural traditions different from the majority of the population.

**ethnographic study** In-depth study of a culture, which uses a combination of methods including participant observation.

**ethology** Study of distinctive adaptive behaviors of species of animals that have evolved to increase survival of the species.

**evolutionary psychology** Application of Darwinian principles of natural selection and survival of the fittest to individual behavior.

**evolutionary/sociobiological perspective** View of human development that focuses on evolutionary and biological bases of behavior.

**executive function** Conscious control of thoughts, emotions, and actions to accomplish goals or solve problems.

**experiential element** Sternberg's term for the insightful or creative aspect of intelligence.

**experiment** Rigorously controlled, replicable procedure in which the researcher manipulates variables to assess the effect of one on the other.

**experimental group** In an experiment, the group receiving the treatment under study.

**explicit memory** Intentional and conscious memory, generally of facts, names, and events.

**extended family** Multigenerational kinship network of parents, children, and other relatives, sometimes living together in an extended-family household.

**externalizing behaviors** Behaviors by which a child acts out emotional difficulties; for example, aggression or hostility.

**external memory aids** Mnemonic strategies using something outside the person.

**family therapy** Psychological treatment in which a therapist sees the whole family together to analyze patterns of family functioning.

**fast mapping** Process by which a child absorbs the meaning of a new word after hearing it once or twice in conversation.

**fertilization** Union of sperm and ovum to produce a zygote; also called *conception*.

**fetal alcohol syndrome (FAS)** Combination of mental, motor, and developmental abnormalities affecting the offspring of some women who drink heavily during pregnancy.

**fetal stage** Final stage of gestation (from 8 weeks to birth), characterized by increased differentiation of body parts and greatly enlarged body size.

**fictive kin** Friends who are considered and behave like family members.

**fidelity** Sustained loyalty, faith, or sense of belonging that results from the successful resolution of Erikson's *identity versus identity confusion* psychosocial stage of development.

**filial crisis** In Marcogen's terminology, normative development of middle age in which adults learn to balance love and duty to their parents with autonomy within a two-way relationship.

**fine motor skills** Physical skills that involve the small muscles and eye-hand coordination.

**five-factor model** Theoretical model of personality, developed and tested by Costa and McCrae, based on the "Big Five" factors underlying clusters of related personality traits: neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness.

**fluid intelligence** Type of intelligence, proposed by Horn and Cattell, that is applied to novel problems and is relatively independent of educational and cultural influences.

**foreclosure** Identity status, described by Marcia, in which a person who has not spent time considering alternatives (that is, has not been in crisis) is committed to other people's plans for their life.

**formal games with rules** Organized games with known procedures and penalties.

**formal operations** Piaget's final stage of cognitive development, characterized by the ability to think abstractly.

**free radicals** Unstable, highly reactive atoms or molecules, formed during metabolism, that can cause internal bodily damage.

**functional age** Measure of a person's ability to function effectively in their physical and social environment in comparison with others of the same chronological age.

**functional fitness** The ability to perform the physical activities of daily living.

**functional play** Play involving repetitive large muscular movements.

**gender** Significance of being male or female.

**gender constancy** Awareness that one will always be male or female; also called *sex-category constancy*.

**gender dysphoria** The feeling of psychological distress experienced by individuals when there is a mismatch between gender identity and biological sex.

**gender identity** Awareness, developed in early childhood, of one's gender.

**gender roles** Behaviors, interests, attitudes, skills, and traits that a culture considers

appropriate for each sex; differ for males and females.

**gender-schema theory** Theory, proposed by Bem, that children socialize themselves in their gender roles by developing a mentally organized network of information about what it means to be male or female in a particular culture.

**gender segregation** Tendency to select playmates of one's own gender.

**gender stereotypes** Preconceived generalizations about male or female role behavior.

**gender-typing** Socialization process by which children, at an early age, learn appropriate gender roles.

**generalized anxiety disorder** Anxiety not focused on any single target.

**generativity** Erikson's term for concern of mature adults for finding meaning through contributing to society and leaving a legacy for future generations.

**generativity versus stagnation** Erikson's seventh stage of psychosocial development, in which the middle-aged adult develops a concern with establishing, guiding, and influencing the next generation or else experiences stagnation (a sense of inactivity or lifelessness).

**generic memory** Memory that produces scripts of familiar routines to guide behavior.

**genes** Small segments of DNA located in definite positions on particular chromosomes; functional units of heredity.

**genetic code** Sequence of bases within the DNA molecule; governs the formation of proteins that determine the structure and functions of living cells.

**genetic counseling** Clinical service that advises prospective parents of their probable risk of having children with hereditary defects.

**genetic-programming theories** Theories that explain biological aging as resulting from a genetically determined developmental timetable.

**genotype** Genetic makeup of a person, containing both expressed and unexpressed characteristics.

**genotype-environment correlation** Tendency of certain genetic and environmental influences to reinforce each other; may be passive, reactive (evocative), or active. Also called *genotype-environment covariance*.

**genotype-environment interaction** The portion of phenotypic variation that results from the reactions of genetically different individuals to similar environmental conditions.

**geriatrics** Branch of medicine concerned with processes of aging and medical conditions associated with old age.

**germinal stage** First 2 weeks of prenatal development, characterized by rapid cell division, blastocyst formation, and implantation in the wall of the uterus.

**gerontology** Study of the aged and the process of aging.

**gestation** Period of development between conception and birth.

**gestational age** Age of an unborn baby, usually dated from the first day of an expectant mother's last menstrual cycle.

**glaucoma** Irreversible damage to the optic nerve caused by increased pressure in the eye.

**goodness of fit** Appropriateness of environmental demands and constraints to a child's temperament.

**grief** Emotional response experienced in the early phases of bereavement.

**grief work** Working out of psychological issues connected with grief.

**gross motor skills** Physical skills that involve the large muscles.

**guided participation** Adult's participation in a child's activity that helps to structure it and bring the child's understanding of it closer to the adult's.

**habituation** Type of learning in which familiarity with a stimulus reduces, slows, or stops a response.

**handedness** Preference for using a particular hand.

**haptic perception** Ability to acquire information about properties of objects, such as size, weight, and texture, by handling them.

**Hayflick limit** Genetically controlled limit, proposed by Hayflick, on the number of times cells can divide in members of a species.

**heredity** Inborn traits or characteristics inherited from the biological parents.

**heritability** Statistical estimate of contribution of heredity to individual differences in a specific trait within a given population.

**heterozygous** Possessing differing alleles for a trait.

**historical generation** A group of people strongly influenced by a major historical event during their formative period.

**holophrase** Single word that conveys a complete thought.

**Home Observation for Measurement of the Environment (HOME)** Instrument to measure the influence of the home environment on children's cognitive growth.

- homozygous** Possessing two identical alleles for a trait.
- horizontal décalage** Piaget's term for an inability to transfer learning about one type of problem to other types of problems sharing the same conceptual underpinnings.
- hormone therapy (HT)** Treatment with artificial estrogen, sometimes in combination with the hormone progesterone, to relieve or prevent symptoms caused by decline in estrogen levels after menopause.
- hospice care** Personal, patient- and family-centered care for a person with a terminal illness.
- hostile attribution bias** Tendency to perceive others as trying to hurt one and to strike out in retaliation or self-defense.
- human development** Scientific study of processes of change and stability throughout the human life span.
- human genome** Complete sequence of genes in the human body.
- hypertension** Chronically high blood pressure.
- hypotheses** Possible explanations for phenomena, used to predict the outcome of research.
- hypothetical-deductive reasoning** Ability, believed by Piaget, to accompany the stage of formal operations, to develop, consider, and test hypotheses.
- ideal self** The self one would like to be.
- identification** In Freudian theory, the process by which a young child adopts characteristics, beliefs, attitudes, values, and behaviors of the parent of the same sex.
- identity** According to Erikson, a coherent conception of the self, made up of goals, values, and beliefs to which a person is solidly committed.
- identity accommodation** Whitbourne's term for adjusting the self-concept to fit new experience.
- identity achievement** Identity status, described by Marcia, that is characterized by commitment to choices made following a crisis, a period spent in exploring alternatives.
- identity assimilation** Whitbourne's term for effort to fit new experience into an existing self-concept.
- identity balance** Whitbourne's term for a tendency to balance assimilation and accommodation.
- identity diffusion** Identity status, described by Marcia, that is characterized by absence of commitment and lack of serious consideration of alternatives.
- identity process theory (IPT)** Whitbourne's theory of identity development based on processes of assimilation and accommodation.
- identity schemas** Accumulated perceptions of the self shaped by incoming information from intimate relationships, work-related situations, and community and other experiences.
- identity versus identity confusion** Erikson's fifth stage of psychosocial development, in which an adolescent seeks to develop a coherent sense of self, including the role they are to play in society. Also called *identity versus role confusion*.
- imaginary audience** The tendency of adolescents to falsely believe themselves to be the focus of others' attention.
- implantation** The attachment of the blastocyst to the uterine wall, occurring at about day 6.
- implicit memory** Unconscious recall, generally of habits and skills; sometimes called *procedural memory*.
- imprinting** Instinctive form of learning in which, during a critical period in early development, a young animal forms an attachment to the first moving object it sees, usually the mother.
- incomplete dominance** Pattern of inheritance in which a child receives two different alleles, resulting in partial expression of a trait.
- independent variable** In an experiment, the condition over which the experimenter has direct control.
- individual differences** Differences in characteristics, influences, or developmental outcomes.
- individual psychotherapy** Psychological treatment in which a therapist sees a troubled person one-on-one.
- individualistic culture** A culture in which people tend to prioritize personal goals ahead of collective goals and to view themselves as distinct individuals.
- individuation** Adolescents' struggle for autonomy and personal identity.
- inductive reasoning** Type of logical reasoning that moves from particular observations about members of a class to a general conclusion about that class.
- inductive techniques** Disciplinary techniques designed to induce desirable behavior by appealing to a child's sense of reason and fairness.
- industry versus inferiority** Erikson's fourth stage of psychosocial development, in which children must learn the productive skills their culture requires or else face feelings of inferiority.
- infant mortality rate** Proportion of babies born alive who die within the 1st year.
- infertility** Inability to conceive a child after 12 months of sexual intercourse without the use of birth control.
- information-processing approach** (1) Approach to the study of cognitive development by observing and analyzing the mental processes involved in perceiving and handling information. (2) Approach to the study of cognitive development that analyzes processes involved in perceiving and handling information.
- initiative versus guilt** Erikson's third stage in psychosocial development, in which children balance the urge to pursue goals with reservations about doing so.
- integration** Process by which neurons coordinate the activities of muscle groups.
- intellectual disability** Significantly subnormal cognitive functioning. Also referred to as cognitive disability or mental retardation.
- intelligent behavior** Behavior that is goal oriented and adaptive to circumstances and conditions of life.
- interactional synchrony** The synchronized coordination of behavior and affect between a caregiver and an infant.
- internalization** During socialization, process by which children accept societal standards of conduct as their own.
- internalizing behaviors** Behaviors by which emotional problems are turned inward; for example, anxiety or depression.
- intersectionality** An analytic framework focused on how a person's multiple identities combine to create differences in privilege or discrimination.
- intersex people** Individuals born with sexual or reproductive anatomical variations not typical for male or female bodies.
- intimacy versus isolation** Erikson's sixth stage of psychosocial development, in which young adults either form strong, long-lasting bonds with friends and romantic partners or face a possible sense of isolation and self-absorption.
- IQ (intelligence quotient)**
- tests** Psychometric tests that seek to measure intelligence by comparing a test-taker's performance with standardized norms.
- irreversibility** Piaget's term for a preoperational child's failure to understand that an operation can go in two or more directions.
- joint attention** A shared attentional focus, typically initiated with eye gaze or pointing.
- kangaroo care** Method of skin-to-skin contact in which a newborn is laid face

down between the mother's breasts for an hour or so at a time after birth.	<b>mammography</b> Diagnostic X-ray examination of the breasts.	the mother's fear through education about the physiology of reproduction and training in breathing and relaxation during delivery.
<b>Kaufman Assessment Battery for Children (K-ABC-II)</b> Nontraditional individual intelligence test designed to provide fair assessments of minority children and children with disabilities.	<b>marital capital</b> Financial and emotional benefits built up during a long-standing marriage, which tend to hold a couple together.	<b>naturalistic observation</b> Research method in which behavior is studied in natural settings without intervention or manipulation.
<b>kinship care</b> Care of children living without parents in the home of grandparents or other relatives, with or without a change of legal custody.	<b>maturational</b> Unfolding of a natural sequence of physical and behavioral changes.	<b>neglect</b> Failure to meet a dependent's basic needs.
<b>laboratory observation</b> Research method in which all participants are observed under the same controlled conditions.	<b>mechanistic model</b> Model that views human development as a series of predictable responses to stimuli.	<b>neonatal jaundice</b> Condition, in many newborn babies, caused by immaturity of liver and evidenced by yellowish appearance; can cause brain damage if not treated promptly.
<b>language</b> Communication system based on words and grammar.	<b>menarche</b> Girl's first menstruation.	<b>neonatal period</b> First 4 weeks of life, a time of transition from intrauterine dependency to independent existence.
<b>language acquisition device (LAD)</b> In Chomsky's terminology, an inborn mechanism that enables children to infer linguistic rules from the language they hear.	<b>menopause</b> Cessation of menstruation and of ability to bear children.	<b>neonate</b> Newborn baby, up to 4 weeks old.
<b>lateralization</b> Tendency of each of the brain's hemispheres to have specialized functions.	<b>metacognition</b> Thinking about thinking, or awareness of one's own mental processes.	<b>neurofibrillary tangles</b> Twisted masses of protein fibers found in brains of persons with Alzheimer's disease.
<b>learning disabilities (LDs)</b> Disorders that interfere with specific aspects of learning and school achievement.	<b>metamemory</b> Understanding of processes of memory.	<b>neurons</b> Nerve cells.
<b>learning perspective</b> View of human development that holds that changes in behavior result from experience or from adaptation to the environment.	<b>midlife crisis</b> In some normative-crisis models, stressful life period precipitated by the review and reevaluation of one's past, typically occurring in the early to middle forties.	<b>niche-picking</b> Tendency of a person, especially after early childhood, to seek out environments compatible with his or her genotype.
<b>LGBTQ+</b> An acronym for lesbian, gay, bisexual, trans, queer and/or questioning, and others.	<b>midlife review</b> Introspective examination that often occurs in middle age, leading to reappraisal and revision of values and priorities.	<b>night terror</b> Abrupt awakening from a deep sleep in a state of agitation, generally occurs in young children.
<b>life expectancy</b> Age to which a person in a particular cohort is statistically likely to live (given their current age and health status), on the basis of average longevity of a population.	<b>mirror neurons</b> Neurons that fire when a person does something or observes someone else doing the same thing.	<b>nightmare</b> A bad dream, sometimes brought on by staying up too late, eating a heavy meal close to bedtime, or overexcitement.
<b>life review</b> Reminiscence about one's life in order to see its significance.	<b>mnemonic device</b> Strategy to aid memory.	<b>nonnormative</b> Characteristic of an unusual event that happens to a particular person or a typical event that happens at an unusual time of life.
<b>life span</b> The longest period that members of a species can live.	<b>monozygotic twins</b> Twins resulting from the division of a single zygote after fertilization; also called <i>identical twins</i> ; they are genetically similar.	<b>nonorganic failure to thrive</b> Slowed or arrested physical growth with no known medical cause, accompanied by poor developmental and emotional functioning.
<b>life-span development</b> Concept of human development as a lifelong process, which can be studied scientifically.	<b>moratorium</b> Identity status, described by Marcia, in which a person is currently considering alternatives (in crisis) and seems headed for commitment.	<b>nonshared environmental effects</b> The unique environment in which each child grows up, consisting of distinctive influences or influences that affect one child differently than another.
<b>linguistic speech</b> Verbal expression designed to convey meaning.	<b>morbidity</b> The condition of being in a state of disease.	<b>normative</b> Characteristic of an event that occurs in a similar way for most people in a group.
<b>literacy</b> (1) Ability to read and write.	<b>multifactorial transmission</b> Combination of genetic and environmental factors to produce certain complex traits.	<b>normative life events</b> In the timing-of-events model, commonly expected life experiences that occur at customary times.
(2) In an adult, ability to use printed and written information to function in society, achieve goals, and develop knowledge and potential.	<b>mutations</b> Permanent alterations in genes or chromosomes that may produce harmful characteristics.	<b>normative-stage models</b> Theoretical models that describe psychosocial development in terms of a definite sequence of age-related changes.
<b>longevity</b> Length of an individual's life.	<b>mutual regulation</b> Process by which infant and caregiver communicate emotional states to each other and respond appropriately.	<b>nuclear family</b> Two-generational kinship, economic, and household unit consisting of one or two parents and their biological children, adopted children, or stepchildren.
<b>longitudinal study</b> Study designed to assess age changes in a sample over time.	<b>myelination</b> Process of coating neural pathways with a fatty substance called myelin, which enables faster communication between cells.	<b>obesity</b> Extreme overweight in relation to age, sex, height, and body type as defined
<b>long-term memory</b> Storage of virtually unlimited capacity that holds information for long periods.	<b>myopia</b> Nearsightedness.	
<b>low-birth-weight babies</b> Weight of less than 5½ pounds (2500 grams) at birth because of prematurity or being small-for-date.	<b>nativism</b> Theory that human beings have an inborn capacity for language acquisition.	
	<b>natural childbirth</b> Method of childbirth that seeks to prevent pain by eliminating	

by having a body mass index at or above the 95th percentile.	physiological changes of menopause; includes first year after end of menstruation; also called the <i>climacteric</i> .	behavior through physical or verbal enforcement of parental control.
<b>object permanence</b> Piaget's term for the understanding that a person or object still exists when out of sight.	<b>permissive parenting</b> In Baumrind's terminology, parenting style emphasizing self-expression and self-regulation.	<b>pragmatics</b> (1) The practical knowledge needed to use language for communicative purposes. (2) The social context of language.
<b>observational learning</b> Learning through watching the behavior of others.	<b>personal fable</b> The adolescent belief in one's uniqueness and invulnerability; associated with risk-taking.	<b>preconventional morality</b> First level of Kohlberg's theory of moral reasoning in which control is external and rules are obeyed in order to gain rewards or avoid punishment or out of self-interest.
<b>observer bias</b> Any expectations, beliefs, or personal preferences of a researcher that unintentionally influence their findings.	<b>personality</b> The relatively consistent blend of emotions, temperament, thought, and behavior that makes a person unique.	<b>prejudice</b> Unfavorable attitude toward members of certain groups outside one's own, especially racial or ethnic groups.
<b>obsessive-compulsive disorder (OCD)</b> Anxiety aroused by repetitive, intrusive thoughts, images, or impulses, often leading to compulsive ritual behaviors.	<b>phenotype</b> Observable characteristics of a person.	<b>prelinguistic speech</b> Forerunner of linguistic speech; utterance of sounds that are not words. Includes crying, cooing, babbling, and accidental and deliberate imitation of sounds without understanding their meaning.
<b>operant conditioning</b> (1) Learning based on association of behavior with its consequences. (2) Learning based on reinforcement or punishment.	<b>phonetic (code-emphasis) approach</b> Approach to teaching reading that emphasizes decoding of unfamiliar words.	<b>premenstrual syndrome (PMS)</b> Disorder producing symptoms of physical discomfort and emotional tension for up to 2 weeks before a menstrual period.
<b>operational definition</b> Definition stated solely in terms of the operations or procedures used to produce or measure a phenomenon.	<b>physical abuse</b> Action taken deliberately to endanger another person, involving potential bodily injury.	<b>preoperational stage</b> In Piaget's theory, the second major stage of cognitive development, in which symbolic thought expands but children cannot yet use logic effectively.
<b>oppositional defiant disorder (ODD)</b> Pattern of behavior, persisting into middle childhood, marked by negativity, hostility, and defiance.	<b>physical development</b> Growth of body and brain, including patterns of change in sensory capacities, motor skills, and health.	<b>prepared childbirth</b> Method of childbirth that uses instruction, breathing exercises, and social support to induce controlled physical responses to uterine contractions and reduce fear and pain.
<b>organismic model</b> Model that views human development as internally initiated by an active organism and as occurring in a sequence of qualitatively different stages.	<b>Piagetian approach</b> Approach to the study of cognitive development that describes qualitative stages in cognitive functioning.	<b>presbycusis</b> Age-related, gradual loss of hearing, which accelerates after age 55, especially with regard to sounds at higher frequencies.
<b>organization</b> (1) Piaget's term for the creation of categories or systems of knowledge. (2) Mnemonic strategy of categorizing material to be remembered.	<b>plasticity</b> (1) Range of modifiability of performance. (2) Modifiability, or "molding," of the brain through experience.	<b>presbyopia</b> Age-related, progressive loss of the eyes' ability to focus on nearby objects due to loss of elasticity in the lens.
<b>osteoporosis</b> Condition in which the bones become thin and brittle as a result of rapid calcium depletion.	<b>play therapy</b> Therapeutic approach that uses play to help a child cope with emotional distress.	<b>pretend play</b> Play involving imaginary people and situations; also called <i>fantasy play, dramatic play, or imaginative play</i> .
<b>Otis-Lennon School Ability Test (OLSAT8)</b> Group intelligence test for kindergarten through 12th grade.	<b>polygamy</b> Family structure in which one spouse, most commonly a man, is married to more than one partner.	<b>preterm (premature) infants</b> Infants born before completing the 37th week of gestation.
<b>palliative care</b> Care aimed at relieving pain and suffering and allowing the terminally ill to die in peace, comfort, and dignity.	<b>polygenic inheritance</b> Pattern of inheritance in which multiple genes at different sites on chromosomes affect a complex trait.	<b>primary aging</b> Gradual, inevitable process of bodily deterioration throughout the life span.
<b>pandemic</b> An epidemic or disease spread across multiple countries or continents.	<b>population</b> The entire pool of individuals under study from which a sample is drawn and to which findings may apply.	<b>primary sex characteristics</b> Organs directly related to reproduction, which enlarge and mature during adolescence.
<b>Parkinson's disease</b> Progressive, irreversible degenerative neurological disorder, characterized by tremor, stiffness, slowed movement, and unstable posture.	<b>postconventional morality (or morality of autonomous moral principles)</b> Third level of Kohlberg's theory of moral reasoning, in which people follow internally held moral principles and can decide among conflicting moral standards.	<b>private speech</b> Talking aloud to oneself with no intent to communicate with others.
<b>participant observation</b> Research method in which the observer lives with the people or participates in the activity being observed.	<b>postformal thought</b> Mature type of thinking that relies on subjective experience and intuition as well as logic and allows room for ambiguity, uncertainty, inconsistency, contradiction, imperfection, and compromise.	<b>problem-focused coping</b> In the cognitive-appraisal model, coping strategy directed toward eliminating, managing, or improving a stressful situation.
<b>parturition</b> The act or process of giving birth.	<b>postmature</b> A fetus not yet born as of 2 weeks after the due date or 42 weeks after the mother's last menstrual period.	<b>procedural memory</b> Long-term memory of motor skills, habits, and ways of doing
<b>passive euthanasia</b> Withholding or discontinuation of life-prolonging treatment of a terminally ill person in order to end suffering or allow death with dignity.	<b>power assertion</b> Disciplinary strategy designed to discourage undesirable	
<b>perimenopause</b> Period of several years during which a woman experiences		

things, which can be recalled without conscious effort; sometimes called <i>implicit memory</i> .	<b>random selection</b> Selection of a sample in such a way that each person in a population has an equal and independent chance of being chosen.	<b>rough-and-tumble play</b> Vigorous play involving wrestling, hitting, and chasing, often accompanied by laughing and screaming.
<b>protective factors</b> Influences that reduce the impact of potentially negative influences and tend to predict positive outcomes.	<b>reaction range</b> Potential variability, depending on environmental conditions, in the expression of a hereditary trait.	<b>sample</b> Group of participants chosen to represent the entire population under study.
<b>proximodistal principle</b> Principle that development proceeds from within to without; that is, that parts of the body near the center develop before the extremities.	<b>real self</b> The self one actually is.	<b>sandwich generation</b> Middle-aged adults squeezed by competing needs to raise or launch children and to care for elderly parents.
<b>psychoanalytic perspective</b> View of human development as shaped by unconscious forces that motivate human behavior.	<b>recall</b> Ability to reproduce material from memory.	<b>scaffolding</b> Temporary support to help a child master a task.
<b>psychometric approach</b> Approach to the study of cognitive development that seeks to measure intelligence quantitatively.	<b>receptive cooperation</b> Kochanska's term for eager willingness to cooperate harmoniously with a parent in daily interactions, including routines, chores, hygiene, and play.	<b>schemes</b> Piaget's term for organized patterns of thought and behavior used in particular situations.
<b>psychosexual development</b> In Freudian theory, an unvarying sequence of stages of childhood personality development in which gratification shifts from the mouth to the anus and then to the genitals.	<b>recessive inheritance</b> Pattern of inheritance in which a child receives identical recessive alleles, resulting in expression of a nondominant trait.	<b>schizophrenia</b> Mental disorder marked by loss of contact with reality; symptoms include hallucinations and delusions.
<b>psychosocial development</b> (1) Pattern of change in emotions, personality, and social relationships. (2) In Erikson's eight-stage theory, the socially and culturally influenced process of development of the ego, or self.	<b>reciprocal determinism</b> Bandura's term for bidirectional forces that affect development.	<b>school phobia</b> Unrealistic fear of going to school; may be a form of <i>separation anxiety disorder</i> or <i>social phobia</i> .
<b>psychosocial moratorium</b> A time, usually during adolescence, during which society allows individuals to address psychosocial crises free from the full responsibilities of adult life.	<b>recognition</b> Ability to identify a previously encountered stimulus.	<b>scientific method</b> System of established principles and processes of scientific inquiry, which includes identifying a problem to be studied, formulating a hypothesis to be tested by research, collecting data, analyzing the data, forming tentative conclusions, and disseminating findings.
<b>puberty</b> Process by which a person attains sexual maturity and the ability to reproduce.	<b>reflective thinking</b> Type of logical thinking that becomes more prominent in adulthood, involving continuous, active evaluation of information and beliefs in the light of evidence and implications.	<b>script</b> General remembered outline of a familiar, repeated event, used to guide behavior.
<b>punishment</b> The process by which a behavior is weakened, decreasing the likelihood of repetition.	<b>reflex behaviors</b> Automatic, involuntary, innate responses to stimulation.	<b>secondary aging</b> Aging processes that result from disease and bodily abuse and disuse and are often preventable.
<b>qualitative change</b> Discontinuous change in kind, structure, or organization.	<b>rehearsal</b> Mnemonic strategy to keep an item in working memory through conscious repetition.	<b>secondary sex characteristics</b> Physiological signs of sexual maturation (such as breast development and growth of body hair) that do not involve the sex organs.
<b>qualitative research</b> Research that focuses on nonnumerical data, such as subjective experiences, feelings, or beliefs.	<b>reinforcement</b> The process by which a behavior is strengthened, increasing the likelihood that the behavior will be repeated.	<b>secular trend</b> Trend that can be seen only by observing several generations, such as the trend toward earlier attainment of adult height and sexual maturity, which began a century ago in some countries.
<b>quantitative change</b> Change in number or amount, such as in height, weight, size of vocabulary, or frequency of communication.	<b>representational ability</b> Piaget's term for capacity to store mental images or symbols of objects and events.	<b>secure attachment</b> Pattern in which an infant is quickly and effectively able to obtain comfort from an attachment figure in the face of distress.
<b>quantitative research</b> Research that deals with objectively measurable data.	<b>representational systems</b> In neo-Piagetian terminology, the third stage in development of self-definition, characterized by breadth, balance, and the integration and assessment of various aspects of the self.	<b>selective optimization with compensation (SOC)</b> Enhancing overall cognitive functioning by using stronger abilities to compensate for those that have weakened.
<b>race</b> A grouping of humans distinguished by their outward physical characteristics or social qualities from other groups. Not a biological construct.	<b>reserve capacity</b> Ability of body organs and systems to put forth 4 to 10 times as much effort as usual under acute stress; also called <i>organ reserve</i> .	<b>self-awareness</b> Realization that one's existence and functioning are separate from those of other people and things.
<b>random assignment</b> Assignment of participants in an experiment to groups in such a way that each person has an equal chance of being placed in any group.	<b>resilient children</b> Children who weather adverse circumstances, function well despite challenges or threats, or bounce back from traumatic events.	<b>self-concept</b> Sense of self; descriptive and evaluative mental picture of one's abilities and traits.
<b>random sample</b> A sample of individuals chosen in such a way that every individual in the population has an equal and independent chance of being chosen.	<b>retrieval</b> Process by which information is accessed or recalled from memory storage.	<b>self-conscious emotions</b> Emotions, such as embarrassment, empathy, and envy, that depend on self-awareness.
	<b>revolving door syndrome</b> Tendency for young adults who have left home to return to their parents' household in times of financial, marital, or other trouble.	
	<b>risk factors</b> Conditions that increase the likelihood of a negative development outcome.	

<b>self-definition</b>	Cluster of characteristics used to describe oneself.	imitating models. Also called <i>social cognitive theory</i> .
<b>self-efficacy</b>	Sense of one's capability to master challenges and achieve goals.	<b>social phobia</b> Extreme fear and/or avoidance of social situations.
<b>self-esteem</b>	The judgment a person makes about their self-worth.	<b>social referencing</b> Understanding an ambiguous situation by seeking another person's perception of it.
<b>self-evaluative emotions</b>	Emotions, such as pride, shame, and guilt, that depend on both self-awareness and knowledge of socially accepted standards of behavior.	<b>social smiling</b> Beginning in the 2nd month, newborn infants gaze at their parents and smile at them, signaling positive participation in the relationship.
<b>self-regulation</b>	A child's independent control of behavior to conform to understood social expectations.	<b>sociocultural theory</b> Vygotsky's theory of how contextual factors affect children's development.
<b>semantic memory</b>	Long-term memory of general factual knowledge, social customs, and language.	<b>socioeconomic status (SES)</b> Combination of economic and social factors describing an individual or family, including income, education, and occupation.
<b>senescence</b>	Period of the life span marked by declines in physical functioning usually associated with aging; begins at different ages for different people.	<b>socioemotional selectivity theory</b> Theory, proposed by Carstensen, that people select social contacts on the basis of the changing relative importance of social interaction as a source of information, as an aid in developing and maintaining a self-concept, and as a source of emotional well-being.
<b>sensitive periods</b>	Times in development when a person is particularly open to certain kinds of experiences.	<b>spermarche</b> Boy's first ejaculation.
<b>sensorimotor stage</b>	Piaget's first stage in cognitive development, in which infants learn through senses and motor activity.	<b>spillover hypothesis</b> Hypothesis that there is a carryover of cognitive gains from work to leisure that explains the positive relationship between activities in the quality of intellectual functioning.
<b>sensory memory</b>	Initial, brief, temporary storage of sensory information.	<b>spontaneous abortion</b> Natural expulsion from the uterus of an embryo that cannot survive outside the womb; also called <i>miscarriage</i> .
<b>separation anxiety</b>	Distress shown by someone, typically an infant, when a familiar caregiver leaves.	<b>Stanford-Binet Intelligence Scales</b> Individual intelligence tests for ages 2 and up used to measure fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory.
<b>separation anxiety disorder</b>	Condition involving excessive, prolonged anxiety concerning separation from home or from people to whom a person is attached.	<b>state of arousal</b> An infant's physiological and behavioral status at a given moment in the periodic daily cycle of wakefulness, sleep, and activity.
<b>sequential study</b>	Study design that combines cross-sectional and longitudinal techniques.	<b>still-face paradigm</b> Experimental methodology in which a parent first interacts typically with their child, then keeps their face still and expressionless, and then ends with a return to typical behavior; used to demonstrate interactional synchrony.
<b>seriation</b>	Ability to order items along a dimension.	<b>stillbirth</b> Death of a fetus at or after the 20th week of gestation.
<b>sex chromosomes</b>	Pair of chromosomes that determines sex: XX in the normal human female, XY in the normal human male.	<b>storage</b> Retention of information in memory for future use.
<b>sex trafficking</b>	The recruitment, harboring, transportation, provision, or obtaining of a person for the purposes of a commercial sex act.	<b>stranger anxiety</b> Wariness of strange people and places, shown by some infants during the second half of the 1st year.
<b>sex-linked inheritance</b>	Pattern of inheritance in which certain characteristics carried on the X chromosome inherited from the mother are transmitted differently to her male and female offspring.	<b>Strange Situation</b> Laboratory technique used to study infant attachment.
<b>sexting</b>	The sharing or sending of sexually explicit or suggestive photos or videos to others.	
<b>sexual abuse</b>	Physically or psychologically harmful sexual activity or any sexual activity involving a child and an older person.	
<b>sexually transmitted infections (STIs)</b>	Infections and diseases spread by sexual contact.	

<b>stress</b> (1) Physical or psychological demands on a person or organism. (2) Response to physical or psychological demands.	<b>theory of multiple intelligences</b> Gardner's theory that each person has several distinct forms of intelligence.	<b>variable-rate theories</b> Theories that explain biological aging as a result of processes that involve damage to biological systems and that vary from person to person.
<b>stressors</b> Perceived environmental demands that may produce stress.	<b>theory of sexual selection</b> Darwin's theory that gender roles developed in response to men's and women's differing reproductive needs.	<b>violation-of-expectations</b> Research method in which dishabituation to a stimulus that conflicts with experience is taken as evidence that an infant recognizes the new stimulus as surprising.
<b>substance abuse</b> Repeated, harmful use of a substance, usually alcohol or other drugs.	<b>timing-of-events model</b> Theoretical model of personality development that describes adult psychosocial development as a response to the expected or unexpected occurrence and timing of important life events.	<b>visual cliff</b> Apparatus designed to give an illusion of depth and used to assess depth perception in infants.
<b>substance dependence</b> Addiction (physical, psychological, or both) to a harmful substance.	<b>trait models</b> Theoretical models of personality development that focus on mental, emotional, temperamental, and behavioral traits, or attributes.	<b>visually based retrieval</b> Process of retrieving the sound of a printed word when seeing the word as a whole.
<b>substantive complexity</b> Degree to which a person's work requires thought and independent judgment.	<b>transduction</b> Piaget's term for a preoperational child's tendency to mentally link particular phenomena, whether or not there is logically a causal relationship.	<b>visual preference</b> Tendency of infants to spend more time looking at one sight than another.
<b>sudden infant death syndrome (SIDS)</b> Sudden and unexplained death of an apparently healthy infant.	<b>transgender people</b> Individuals whose gender identity (a social and psychological construct) is different from their sex (a biological construct).	<b>visual recognition memory</b> Ability to distinguish a familiar visual stimulus from an unfamiliar one when shown both at the same time.
<b>survival curve</b> A curve on a graph showing the percentage of people or animals alive at various ages.	<b>transitive inference</b> Understanding the relationship between two objects by knowing the relationship of each to a third object.	<b>vital capacity</b> Amount of air that can be drawn in with a deep breath and expelled.
<b>symbolic function</b> Piaget's term for ability to use mental representations (words, numbers, or images) to which a child has attached meaning.	<b>triangular theory of love</b> Sternberg's theory that patterns of love hinge on the balance among three elements: intimacy, passion, and commitment.	<b>Wechsler Adult Intelligence Scale (WAIS)</b> Intelligence test for adults that yields verbal and performance scores as well as a combined score.
<b>syntax</b> Rules for forming sentences in a particular language.	<b>triarchic theory of intelligence</b> Sternberg's theory describing three elements of intelligence: componential, experiential, and contextual.	<b>Wechsler Preschool and Primary Scale of Intelligence, Revised (WPPSI-IV)</b> Individual intelligence test for children, which yields verbal and performance scores as well as a combined score.
<b>systems of action</b> Increasingly complex combinations of motor skills, which permit a wider or more precise range of movement and more control of the environment.	<b>turning points</b> Psychological transitions that involve significant change or transformation in the perceived meaning, purpose, or direction of a person's life.	<b>WEIRD</b> Acronym (Western, educated, industrialized, rich, and democratic) for the type of societies from which research samples are typically drawn.
<b>tacit knowledge</b> Sternberg's term for information that is not formally taught but is necessary to get ahead.	<b>two-way (dual-language) learning</b> Approach to second-language education in which English speakers and non-English-speakers learn together in their own and each other's languages.	<b>whole-language approach</b> Approach to teaching reading that emphasizes visual retrieval and use of contextual clues.
<b>telegraphic speech</b> Early form of sentence use consisting of only a few essential words.	<b>typological approach</b> Theoretical approach that identifies broad personality types, or styles.	<b>withdrawal of love</b> Disciplinary strategy that involves ignoring, isolating, or showing dislike for a child.
<b>temperament</b> Characteristic disposition, or style of approaching and reacting to situations.	<b>ultrasound</b> Prenatal medical procedure using high-frequency sound waves to detect the outline of a fetus and its movements, so as to determine whether a pregnancy is progressing normally.	<b>working memory</b> Short-term storage of information being actively processed.
<b>teratogen</b> Environmental agent, such as a virus, a drug, or radiation, that can interfere with normal prenatal development and cause developmental abnormalities.		<b>zone of proximal development (ZPD)</b> Vygotsky's term for the difference between what a child can do alone and what the child can do with help.
<b>terminal drop</b> A frequently observed decline in cognitive abilities near the end of life. Also called <i>terminal decline</i> .		<b>zygote</b> One-celled organism resulting from fertilization.
<b>thanatology</b> Study of death and dying.		
<b>theory</b> Coherent set of logically related concepts that seeks to organize, explain, and predict data.		
<b>theory of mind</b> Awareness and understanding of mental processes.		



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