

Motivation and Emotion



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Preview

When your clock goes off in the morning, do you jump out of bed, eager to face the day, or do you bury your head in the blankets? Once you're at your job or on campus, do you always do your best, or do you work just hard enough to get by? Are you generally happy? Do you sometimes worry or feel sad? In this chapter, we explore the physical, mental, and social factors that motivate behavior in areas ranging from eating to sexuality to achievement. We also examine what emotions are and how they are expressed.



Motivation and Emotion

The link between motivation and emotion can be seen in many situations. For example, being motivated to win the U.S. National Spelling Bee creates strong emotions, as we see in this winning contestant. And the link works both ways. Often, emotions create motivation, as when anger leads a person to become aggressive toward a child or when love leads a person to provide for that child.

Kamenko Pajic/Up/Landov

motivation The influences that account for the initiation, direction, intensity, and persistence of behavior.

motive A reason or purpose for behavior.

Think of a famous person you admire—maybe a business or technology innovator like Steve Jobs, an inspiring leader like Martin Luther King, an athlete like Serena Williams, or an actor like Denzel Washington. As with these people, success probably came to the person you chose only after years of great effort and unwavering determination. Why do some people work so hard in the face of daunting challenges and tough competition and rise to the top of their fields? For that matter, why do any of us try to excel, to perform acts of kindness, to look for food, to take dancing lessons, to go bungee jumping, to become violent, or to act in any other particular way? Why do some people go all out to reach a goal whereas others make only half-hearted efforts and quit at the first obstacle?

Questions about “why” behavior occurs are questions about **motivation**, the processes that give behavior its energy, direction, intensity, and persistence (Figner & Weber, 2011; Reeve, 2009). Like the study of *how* people and other animals behave and think, the puzzle of *why* they do so has intrigued psychologists for decades. Part of the motivation for behavior is to feel certain emotions, such as the joy of finishing a race or becoming a parent. Motivation also affects emotion, as when hunger makes you more likely to be annoyed by people around you. In this chapter, we review several aspects of motivation and the features and value of emotions.

CONCEPTS AND THEORIES OF MOTIVATION

Where does motivation come from?

Suppose that a woman works two jobs, never goes to parties, wears used clothes, drives an old car, eats food left behind by others, ignores charity appeals, and keeps her house at sixty degrees all winter. Why does she do these things? You could suggest a separate explanation for each of these behaviors, or you could suggest a **motive**, a reason or purpose that provides a single explanation for all of them. That unifying motive might be the woman’s desire to save as much money as possible. This example illustrates that motivation itself cannot be directly observed. We have to infer, or presume, that motivation is present based on what we can observe.

Sources of Motivation

Human motivation stems from five main sources. First, we are motivated by *physiological factors*, such as when hormones or certain areas of the brain influence sexual interest. Second, our behavior is motivated by *needs*, such as food, water, or sleep. *Emotional factors* provide a third source of motivation. Panic, fear, anger, love, envy, and hatred influence behaviors ranging from selfless giving to brutal murder (Terburg, Aarts, & van Honk, 2012; van de Ven, Zeelenberg, & Pieters, 2011). *Cognitive factors* are a fourth source of motivation. These include perceptions of the world, beliefs about what you can and cannot do, the amount of choice or control you think you have in particular situations, and expectations about how others will respond to the behaviors you are considering (e.g., Johnson & Fujita, 2012; Laurin, Kay, & Fitzsimons, 2012; Witt, Linkenauger, & Proffitt, 2012). For example, some contestants who try for stardom on talent shows such as *American Idol* seem utterly confident in their ability to sing despite being painfully wrong. Finally, motivation stems from *social and environmental factors* (Neville, 2012). These include the influence of parents, teachers, siblings, friends, television, and other sociocultural forces. Have you ever bought a jacket, tried a new hairstyle, or gotten a tattoo, not because you really liked it but because it was in fashion at the time? And think about all the times when deadlines and demands from teachers or parents or bosses led you to spend time doing things that you might not otherwise have done. These are examples of how social factors can affect almost all human behavior.

No one source of motivation fully explains all aspects of why people behave as they do, but psychologists combine them in various ways to formulate four main theories of

motivation. These include the *instinct doctrine*, *drive reduction theory*, *arousal theory*, and *incentive theory*. Each theory has helped account for some aspects of behavior.

Instinct Doctrine and Its Descendants

In the early 1900s, many psychologists explained motivation in terms of the **instinct doctrine**, which highlights the instinctive nature of behavior. **Instinctive behaviors** are automatic, involuntary, and unlearned behavior patterns consistently “released” or triggered by particular stimuli (Tinbergen, 1989). For example, the male stickleback fish instantly attacks when it sees the red underbelly of another male. Such behaviors in non-human species were originally called *fixed-action patterns* because they are unlearned, genetically coded responses to specific “releaser” stimuli.

William McDougall (1908) argued that human behavior, too, is instinctive. He began by listing eighteen human instinctive behaviors that included self-assertion, reproduction, pugnacity (eagerness to fight), and gregariousness (sociability). Within a few years, McDougall and other theorists named over 10,000 instinctive behaviors, prompting one critic to say that his colleagues had “an instinct to produce instincts” (Bernard, 1924). The problem was that instincts had become meaningless labels that described behavior without explaining it. Saying that people gamble because of a gambling instinct or work hard because of a work instinct explains nothing about why these behaviors appear in some people and not others or about how they develop. Applying the instinct doctrine to human motivation also seemed problematic because people display few, if any, instinctive fixed-action patterns.

Today, psychologists continue to investigate the role played by inborn tendencies in human motivation. Their work has been stimulated partly by research on a number of human behaviors that are present at birth. Among these are the sucking, grasping, and other reflexes discussed in the human development chapter, as well as apparent dislike of bitter tastes (Steiner et al., 2001) and enjoyment of sweet ones (Booth et al., 2010). Further, as discussed in the chapter on learning, humans appear to be biologically prepared to learn to fear snakes and other potential dangers (e.g., Öhman et al., 2012). But psychologists’ thinking about instinctive behavior is more sophisticated now than it was a century ago. For one thing, they recognize that inborn tendencies are more flexible than early versions of the instinct doctrine suggested. It turns out that so-called fixed-action patterns—even the simple ones shown by baby chicks as they peck at seeds—actually vary quite a bit among individuals and can be modified by experience (Deich, Tancoos, & Balsam, 1995). Accordingly, these tendencies are now often referred to as *modal action patterns*. They recognize, too, that even though certain behaviors reflect inborn motivational tendencies, those behaviors may or may not actually appear, depending on each individual’s experience. So although we might be biologically “programmed” to learn to fear snakes, that fear won’t develop if we never see a snake. In other words, motivation can be influenced by inherited tendencies, but that doesn’t mean that all motivated behavior is genetically determined.

By emphasizing the possible evolutionary roots of human behavior, modern versions of the instinct doctrine focus on the ultimate, long-term reasons behind much of what we do. Psychologists who take an evolutionary approach to behavior suggest that a wide range of behavioral tendencies have evolved because over the centuries they were adaptive for individual survival in particular circumstances. Those who possessed and expressed these adaptive predispositions were more likely than others to live to produce children. We are descendants of these human survivors, so to the extent that their behavioral predispositions were transmitted genetically, we should have inherited similar predispositions. Evolutionary psychologists also argue that many aspects of human social behavior—including helping, aggression, and the choice of sexual or marriage partners—are motivated by inborn factors, especially by the desire to maximize our genetic contribution to the next generation (Kenrick, 2012). We may not be consciously aware of this desire (Hassin, 2013), so you’re more likely to hear someone say “I can’t wait to have children” than to hear them say “I want to pass on my genes.”

instinct doctrine A view that behavior is motivated by automatic, involuntary, and unlearned responses.

instinctive behaviors Innate, automatic dispositions to respond in particular ways to specific stimuli.



Evolution at Work?

The marriage of Donald Trump to Melania Knauss-Trump, a former model who is twenty-four years his junior, illustrates the worldwide tendency for older men to often prefer younger women and for younger women to prefer older men. This tendency has been interpreted as evidence supporting an evolutionary explanation of mate selection, but skeptics see social and economic forces at work in establishing these preference patterns.

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The Instinct Doctrine and Mate Selection

The evolutionary approach suggests, for example, that people's choice of a marriage partner or sexual mate is influenced by the consequences of the choices made by their ancestors over countless generations. For instance, research in many different cultures shows that both men and women express a strong preference for a long-term partner who is dependable, emotionally stable, and intelligent—characteristics that create a good environment for having and raising children (Buss et al., 1990). But evolutionary psychologists also point to sex differences in mating preferences and strategies. They argue that since women can produce fewer children in their lifetimes than men can, they may be more psychologically invested in their children's survival and development. This greater investment might motivate women to be choosier than men in selecting mates.

It takes some time to assess resource-related characteristics (he drives an expensive car, but can he afford it?), which is why, according to an evolutionary view, women are more likely than men to prefer a period of courtship before sex. Research suggests that men tend to be less selective because they want to start a sexual relationship sooner than women (Buss, 2004b; Buss & Schmitt, 1993). Their eagerness to engage in sex early in a relationship is seen as reflecting their evolutionary ancestors' tendency toward opportunistic sex as way to maximize their genetic contribution to the next generation. Evolutionary psychologists suggest that a desire to produce as many children as possible motivates men's attraction to women whose fertility and good health are signaled by factors generally associated with physical beauty, such as clear skin and a low waist-to-hip ratio (Buss, 2009).

Research support for such ideas includes preference ratings from several thousand people in more than three dozen cultures, showing that men generally prefer physical attractiveness and good health in prospective mates, and that women generally prefer mates with higher levels of social status and financial resources (March & Bramwell, 2012; Shackelford, Schmitt, & Buss, 2005).

Critics argue that such preferences stem from cultural traditions, not genetic predispositions. Among the Zulu of South Africa, where women are expected to build houses, carry water, and perform other physically demanding tasks, men tend to value maturity and ambition in a mate more than women do (Buss, 1989). The fact that women have been systematically denied economic and political power in many cultures may account for their tendency to rely on the security and economic power provided by men (Eagly, Wood, & Johannesen-Schmidt, 2004; Silverstein, 1996). Indeed, an analysis of data from thirty-seven cultures showed that women valued potential mates' access to resources far more in cultures that sharply limited women's reproductive freedom and educational opportunities (Kasser & Sharma, 1999). Evolutionary theorists agree that cultural forces and traditions shape behavior, but they focus on how evolutionary factors might contribute to these forces and traditions, including the relative ease with which certain gender roles and mate preferences emerge (e.g., Geher, Camargo, & O'Rourke, 2008). For instance, whereas men are generally more willing to engage in casual sex than women, this tendency is more often seen in cultures where there is more pressure to have many children, and less likely where there is more emphasis on social and economic gender equality (Schmitt, 2005).

Drive Reduction Theory

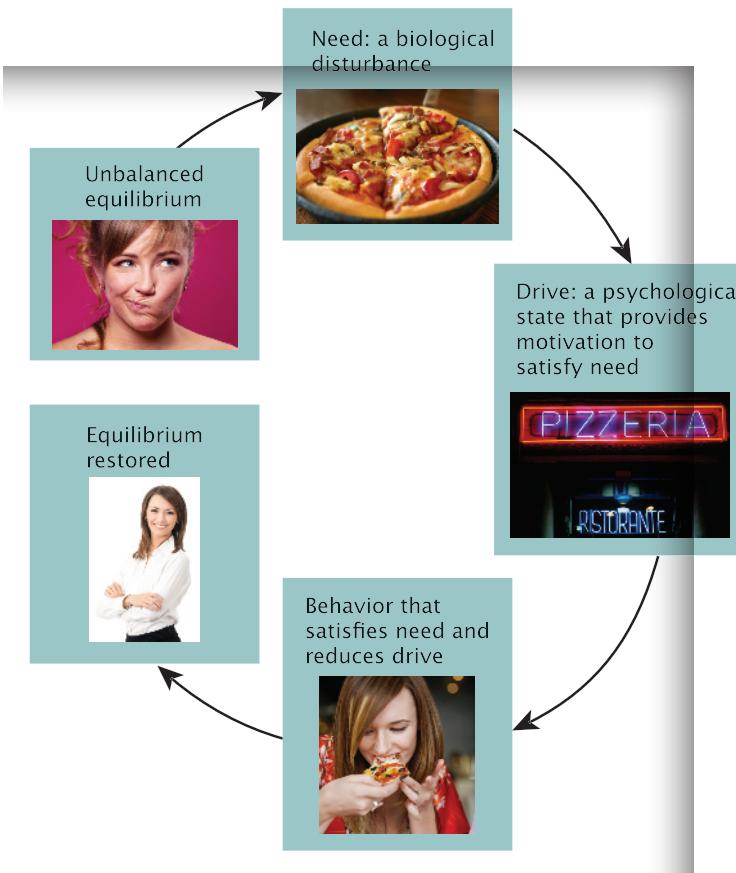
Like the instinct doctrine, the drive reduction theory of motivation emphasizes internal factors, but it focuses mainly on how such factors maintain homeostasis. **Homeostasis** (pronounced "ho-me-oh-STAY-sis") is the tendency to make constant adjustments to maintain body temperature, blood pressure, and other physiological systems at a steady level, or *equilibrium*—much as a thermostat functions to maintain a constant temperature in a house.

homeostasis The tendency for physiological systems to remain stable by constantly adjusting themselves in response to change.

FIGURE 10.1
Drive Reduction Theory and Homeostasis

The mechanisms of homeostasis regulate your body temperature and food and water intake, among other things. For example, when you don't have enough nutrients in your bloodstream, an unbalanced equilibrium is created and your body develops a need for food. This biological disturbance leads to your drive to find something to eat, perhaps by ordering a pizza. After eating satisfies your need for food, your equilibrium is restored.

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According to **drive reduction theory**, any imbalances in homeostasis create **needs**, which are biological requirements for well-being. To respond, the brain tries to restore homeostasis by creating a psychological state called **drive**—a feeling that prompts an organism to take action to meet the need, and thus create homeostatic balance. For example, if you have had nothing to drink for some time, the chemical balance of your body fluids changes, creating a physiological need for water. A consequence of this need is a drive—thirst—motivating you to find and drink water. After you drink, the need for water is met, so the drive to drink is reduced. In other words, drives push people to satisfy needs, thus reducing the drives. Remember, in this formulation, a *need* is a *biological requirement*, and a *drive* is the *psychological state* that may help address it. The cycle is shown in Figure 10.1.

Early drive reduction theorists described two types of drives. **Primary drives** stem from physiological needs, such as a need for food or water. People do not have to learn these basic needs or the primary drives to satisfy them (Hull, 1951). However, we learn other drives through experience. These learned **secondary drives** motivate us to act as if we have unmet basic needs. For example, as we learn to associate money with buying things that satisfy primary drives for food, shelter, and so on, having money becomes a secondary drive. Having too little money then motivates many behaviors—from hard work to stealing—to get more funds (Nordgren & Chou, 2011).

Arousal Theory

Drive reduction theory can account for many motivated behaviors, but not all of them. Consider curiosity, for example. Monkeys, dogs, cats, and rats will work hard simply to enter a new environment, especially if it is complex and has new objects to explore and manipulate (Loewenstein, 1994). And most humans, too, can't resist checking out whatever is new and unusual. We go to a new play, watch builders work, surf the Internet, and travel the world just to see what there is to see. People also ride roller coasters, skydive,

drive reduction theory A theory that motivation arises from imbalances in homeostasis.

needs Biological requirements for well-being.

drive A psychological state that arises from an imbalance in homeostasis and prompts action to fulfill a need.

primary drives Drives that arise from basic biological needs.

secondary drives Stimuli that take on the motivational properties of primary drives through learning.



Arousal and Personality

People whose ideal, or optimal, level of arousal is high are more likely to smoke, drink alcohol, engage in frequent sexual activity, listen to loud music, eat "hot" foods, and do other things that are stimulating, novel, and risky (Farley, 1986; Zuckerman, 1993). Those whose optimal level of arousal is lower tend to take fewer risks and behave in ways that are less stimulating. As discussed in the personality chapter, differences in optimal arousal may help shape other characteristics, such as whether we tend to be introverted or extraverted.

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drive race cars, and do many other things that do not reduce any known drive (e.g., Bergman & Kitchen, 2009; Hsee, Yang, & Wang, 2010).

In fact, far from reducing a drive, such behaviors seem to increase **physiological arousal**—the body's general level of activation. Physiological arousal is reflected in heart rate, muscle tension, brain activity, blood pressure, and other bodily systems (Plutchik & Conte, 1997). It is usually low during deep sleep, but physiological arousal can also be lowered by meditation, relaxation techniques, and depressant drugs. Increased arousal tends to occur in response to hunger, thirst, stimulant drugs, and stimuli that are intense, sudden, new, or unexpected. Because people sometimes try to reduce their arousal and sometimes try to increase it, some psychologists have suggested that motivation is tied to the regulation of physiological arousal.

Specifically, **arousal theory** suggests that we are motivated to behave to keep or restore an ideal, or *optimal level*, of arousal (Hebb, 1955). Too much arousal can hurt performance, as when test anxiety interferes with some students' ability to recall what they studied. Overarousal can also cause athletes to "choke" so badly that they miss an easy catch or a simple shot (Balk et al., 2013; Buelow & Frakey, 2013). Underarousal, too, can cause problems, as you probably know if you have ever tried to work, drive, or study when you are sleepy. So we try to increase arousal when it is too low, such as when we're bored, and decrease it when it is too high, such as when we're stressed or overstimulated. How much arousal is "just right"? The answer may not be the same for all people. People appear to differ in their optimal level of arousal (Zabel et al., 2009; Zuckerman, 1984). These differences in optimal arousal may stem from inherited differences in the nervous system (e.g., Derringer et al., 2010; Eysenck, 1990a) and may motivate boldness, shyness, and many other personality traits and behavioral tendencies.

Incentive Theory

Instinct, drive reduction, and arousal theories of motivation all focus on internal processes that prompt us to behave in certain ways. In contrast, **incentive theory** emphasizes how external stimuli motivate behavior. According to this view, people are pulled toward behaviors that bring positive incentives (maximizing pleasure) and are pushed away from behaviors with negative incentives (minimizing pain). For example, as described in the learning chapter, operant conditioning occurs because we're more likely to repeat actions that are followed by positive outcomes rather than by negative ones. According to incentive theory, differences in behavior from one person to another or from one situation to another can be traced to the incentives available and the value a person places on those incentives at the time. If you expect that some behavior (such as buying a lottery ticket or apologizing for a mistake) will lead to a valued outcome (winning money or reducing guilt), you will be motivated to engage in that behavior (Bastian, Jetten, & Fasoli, 2011; Cooke et al., 2011).

The value of incentives can be influenced by inborn physiological factors such as hunger and thirst as well as by cognitive and social factors (e.g., Chein et al., 2011; DeVoe & Iyengar, 2010). As an example of physiological influences, consider that food is a more motivating incentive when you are hungry than when you're full. As for cognitive and social influences, notice that the value of some things we eat—such as communion wafers or diet shakes—isn't determined by hunger or flavor but by what our culture has taught us about spirituality, health, or attractiveness. Perhaps you have also noticed that what early drive reduction theorists called *primary drives* reappear in incentive theory as unlearned influences on an incentive's value. *Secondary drives* reappear as learned influences on the value of incentives.

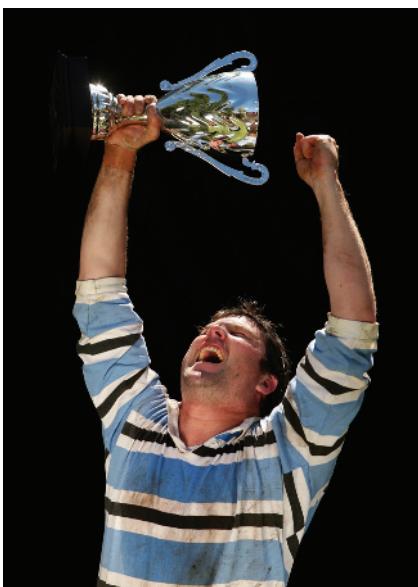
Intrinsic and Extrinsic Motivation

Suppose that you decide to learn a new language, write a book, start an exercise program, or volunteer at a homeless shelter. Like almost everything else we do, these decisions can be based on intrinsic motivation or extrinsic motivation (Deci et al., 2001; Ryan & Deci, 2000).

physiological arousal A general level of activation reflected in several physiological systems.

arousal theory A theory that people are motivated to maintain what is an optimal level of arousal for them.

incentive theory A theory that people are pulled toward behaviors that offer positive incentives and pushed away from behaviors associated with negative incentives.



The Hidden Cost of Reward

We might expect that when people receive money, trophies, prizes, and other extrinsic rewards for doing something, they would be more motivated to continue doing it. As described in the learning chapter, this may be true as long as the rewards continue, but external rewards can undermine intrinsic motivation and may result in poorer performance over time (Pulfrey, Buchs, & Butera, 2011). The adverse effect of extrinsic motivation on intrinsic motivation has been called *the hidden cost of reward* (Lepper & Greene, 1978).

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Intrinsic motivation would lead you to do these things simply to experience the pleasure and satisfaction of doing them, and especially to enjoy the feelings of competence and autonomy (independence) they bring (Przybylski et al., 2011). When intrinsically motivated to do something, you're likely to explain your behavior by saying, "I enjoy it" or "It's interesting." But you might do those same things because of **extrinsic motivation**, in which case your actions would be aimed at achieving some external goal, such as pleasing or impressing other people, qualifying for a better job, alleviating a health problem, or making money. In such cases, you would probably explain your behavior in a different way, perhaps by saying, "It's a good way to get a raise" or "My parents insisted." And, of course, there are many cases in which behavior is based on both intrinsic and extrinsic motivation. For example, many people decide to get in shape not only to experience a sense of accomplishment and autonomy but also to become more physically attractive to others.

It isn't always easy to tell whether someone's behavior is based on intrinsic or extrinsic motivation, and sometimes we may not be sure what motivates our own behavior. Psychologists have discovered some clues, however (Vansteenkiste et al., 2009). For example, when people are intrinsically motivated—doing things mainly for the sake of doing them—they tend to show greater energy, persistence, and creativity, more enjoyment, and better learning than when they are motivated mainly by extrinsic rewards such as money or grades (Ryan & Deci, 2000). So you are more likely to understand this chapter, think actively about its contents, and enjoy reading it if you're motivated by intrinsic, rather than extrinsic, factors (Vansteenkiste et al., 2005). This is one reason that students who take courses because they *want* to often do better—and enjoy class more—than those who take courses because they *have* to.

What happens if a person who is intrinsically motivated to engage in an activity—painting or singing or woodworking, say—begins to receive an extrinsic reward for it? If the extrinsic motivation is added to the intrinsic motivation, you might expect to see super-high motivation and performance, but that is not what typically happens. Instead, the longer people receive extrinsic rewards for doing something that had been intrinsically motivated, the less intrinsic motivation they show later on (e.g., Deci, Koester, & Ryan, 1999; Murayama et al., 2010).

So although creating extrinsic motivation with rewards and punishments is a vital tool to shape all kinds of behavior, in some situations it creates some hidden costs (Lepper & Greene, 1978). Extrinsic rewards can dampen intrinsic motivation and interfere with learning. If you have been learning French just for fun, but are now offered a lot of money for doing well in the course, the fun might disappear and the arousal associated with worrying about the next test might impair your performance. Even if it doesn't, the prospect of getting that reward might change what and how you learn. Because extrinsically motivated students tend to focus on test scores, final grades, and other external rewards rather than on really trying to understand and apply course material, they tend to be passive learners (Vansteenkiste et al., 2005). As described in the learning and memory chapters, passive learners may be at a disadvantage because they depend on superficial reading and rote memorization rather than more active learning methods.

Yet another hidden cost of relying on extrinsic motivation in education is that it can undermine students' capacity to be independent learners (Lepper, 1983; Ryan, 1993). After years of receiving rewards for doing well on tests, students may become dependent on them. Over time, the learning process becomes little more than just a process of studying for tests. Questions about whether, when, and how long to study come to be regulated by the test schedule rather than by interest or curiosity. As a result, when students ask teachers if the final exam will cover the entire course, they may really be asking when they can stop trying to remember what they learned for previous exams.

Not all extrinsic rewards bring hidden costs (Cameron, 2001; Deci et al., 1999). Research shows that these costs are most likely for rewards that are both expected (announced in advance) and tangible (money, food, or prizes). The costs are less likely when rewards are unexpected and intangible, such as a sincere compliment from a respected

intrinsic motivation Engaging in behavior simply for the feelings of pleasure, satisfaction, or sense of competence or independence it brings.

extrinsic motivation Engaging in behavior in order to obtain an external reward or avoid a penalty or other undesirable consequence.

teacher, colleague, or boss. Unfortunately, expected and tangible rewards are exactly the kinds that are most commonly used in schools and workplaces (Kohn, 1993).

"In Review: Sources, Theories, and Types of Motivation" summarizes our discussion of the basic concepts and principles of motivation. These concepts and principles have helped to guide research on motivated behaviors such as eating, sex, and work, which we consider in the sections that follow.

IN REVIEW	
SOURCES, THEORIES, AND TYPES OF MOTIVATION	
Sources of Motivation	
Source	Examples
Physiological factors	Activity of hormones or brain cells
Needs	Food, water, or sleep
Emotional factors	Feelings, such as happiness, sadness, fear, anger, surprise, or disgust
Cognitive factors	Perceptions and beliefs about yourself and the consequences of your actions
Social and environmental factors	Influence of other people or situations
Theories of Motivation	
Theory	Main Points
Instinct doctrine	Innate biology produces instinctive behaviors.
Drive reduction	Behavior is guided by biological needs and learned ways of reducing drives that arise from those needs.
Arousal	People seek to maintain an optimal level of physiological arousal, which differs from person to person. Maximum performance occurs at optimal arousal levels.
Incentive	Behavior is guided by the lure of rewards and the threat of punishment. Cognitive factors influence expectations of the value of various rewards and the likelihood of attaining them.
Types of Motivation	
Type	Examples
Intrinsic	Doing things for the sake of enjoyment, satisfying curiosity, or feeling competent or independent
Extrinsic	Doing things to get money, prizes, or other external rewards
In Review Questions	
<ol style="list-style-type: none"> 1. The fact that some people like roller coasters and other scary amusement park rides has been cited as evidence for the _____ theory of motivation. 2. Evolutionary theories of motivation are modern outgrowths of theories based on _____. 3. The value of incentives can be affected by _____, _____, and _____ factors. 	

HUNGER AND EATING

What makes me start eating and stop eating?

At first glance, eating seems to be a simple example of homeostasis and drive reduction theory at work. You're motivated to eat when you get hungry. Much as a car needs gasoline, you need fuel from food, so you eat. If so, what bodily mechanism is the "gauge" to signal the need for food? What determines which foods you eat, and how you know when to stop? Answers to these questions involve complex interactions between the brain and the rest of the body, but they also involve learning, social, and environmental factors.

Biological Signals for Hunger and Satiation

A variety of mechanisms operate to create **hunger**, the general state of wanting to eat, and **satiation** (pronounced "say-she-EH-shun"), the satisfaction of hunger. Satiation leads to **satiety** (pronounced "seh-TYE-a-tee"), a state in which we no longer want to eat.

Signals from the Gut

The stomach seems a logical source for hunger and satiety signals. You have probably felt hunger pangs from an "empty" stomach and felt "stuffed" after overeating. In fact, the stomach does contract during hunger pangs, and increased pressure in the stomach can reduce appetite (Cannon & Washburn, 1912; Houpt, 1994). But people who have lost their stomachs due to illness still get hungry and eat normal amounts of food (Janowitz, 1967). So while stomach cues clearly can affect eating, they appear to operate mainly when you are very hungry or very full. The small intestine also regulates eating (Maljaars et al., 2008). It is lined with cells that detect the presence of nutrients and send neural signals to the brain about the need to eat (Capasso & Izzo, 2008). Part of the signaling process even involves bacteria that normally live in a healthy gastrointestinal system. These "gut" microorganisms generate chemicals in response to the food they encounter (Stilling, Dinan, & Cryan, 2014). Psychologists are just starting to study this chemical signaling, but the process appears to have far-reaching consequences, affecting digestion and a desire to eat or stop eating, as well as influencing emotions, learning, and stress responses (Cryan & Dinan, 2012; Li et al., 2009; Ridaura et al., 2013).

Signals from the Blood

Still, the most important signals about the body's fuel level and nutrient needs are sent to the brain from the blood. The brain's ability to "read" blood-borne signals about the body's nutritional needs was discovered when researchers deprived rats of food for a long period and then injected some of the rats with blood from rats that had just eaten. When offered food, the injected rats ate little or nothing (Davis et al., 1969). Something in the injected blood of the well-fed animals apparently signaled the hungry rats' brains that there was no need to eat. What was that satiety signal? Research has shown that the brain constantly monitors both the level of food nutrients absorbed into the bloodstream from the stomach and the level of hormones released into the blood in response to those nutrients (Burda-kov, Karnani, & Gonzalez, 2013; Parker & Bloom, 2012).

The nutrients that the brain monitors include *glucose* (the main form of sugar used by body cells), *fatty acids* (from fats), and *amino acids* (from proteins). When the level of blood glucose drops, eating increases sharply (Chaput & Tremblay, 2009; Mogenson, 1976). The brain also monitors hormone levels to regulate hunger and satiety. For example, when a lack of nutrients is detected by the stomach, the hormone *ghrelin* is released into the bloodstream and acts as a "start eating" signal when it reaches the brain (Pradhan, Samson, & Sun, 2013). When glucose levels rise, the pancreas releases *insulin*, a hormone that most body cells need in order to use the glucose they receive. Insulin itself may also provide a satiety signal by acting directly on brain cells (Brüning et al., 2000; Lakhi, Snow, & Fry, 2013).

hunger The general state of wanting to eat.

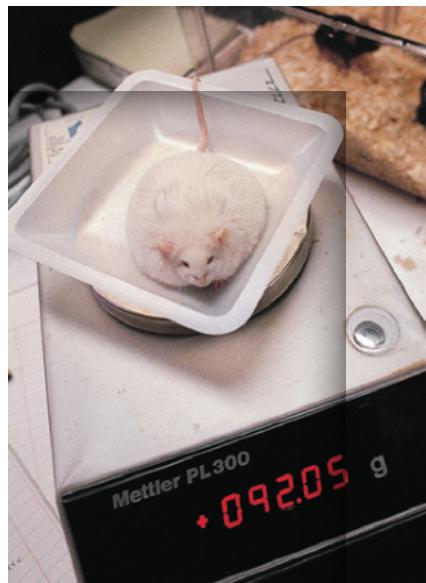
satiation The satisfaction of a need such as hunger.

satiety The condition of no longer wanting to eat.

The hormone *leptin* (from the Greek word for “thin”) appears to be a key satiety signal to the brain (Fève & Bastard, 2012). Unlike glucose and insulin, whose satiety signals help us know when to end a particular meal, leptin appears to be involved mainly in the long-term regulation of body fat (Huang & Li, 2000). The process works like this: cells that store fat normally have genes that produce leptin. As the fat supply in these cells increases, leptin enters the blood and reduces food intake (Tamashiro & Bello, 2008). Mice with defects in these genes make no leptin and are obese (Bouret, Draper, & Simerly, 2004). When these animals are given leptin injections, though, they rapidly lose weight and body fat but not muscle tissue (Forbes et al., 2001). Leptin injections can also produce the same changes in normal animals (Priego et al., 2010). Some cases of human obesity are due to leptin dysregulation (e.g., Müller et al., 2009), but for most of us, leptin is not a “magic bullet” against obesity. Although leptin injections help those rare people whose fat cells make no leptin (Kelesidis et al., 2010), this treatment is far less effective in people who are obese due to eating a high-fat diet (Heymsfield et al., 1999). In these far more common cases of obesity, the brain appears to have become less sensitive to leptin’s satiety signals (e.g., Lustig et al., 2004).

Hunger and the Brain

LINKAGES How does the brain know when we are hungry? (a link to Biological Aspects of Psychology)



One Fat Mouse

After surgical damage to its ventromedial nucleus, this mouse ate enough to triple its body weight. Results such as this initially led many psychologists to conclude that food intake is regulated by a combination of “start-eating” signals from the lateral hypothalamus and “stop-eating” signals from the ventromedial nucleus. We now know that the regulation process is far more complex and involves more than just these two brain regions.

Richard Howard Photography

Many brain areas help control eating. The hypothalamus in particular may play a primary role in detecting and reacting to blood signals about the need to eat. The hypothalamus influences both how much food is taken in and how quickly its energy is used, or metabolized.

Some regions of the hypothalamus detect ghrelin, leptin, and insulin; these regions generate signals that either increase hunger and reduce energy expenditure or reduce hunger and increase energy expenditure (Crépin et al., 2014; Kanoski et al., 2013). At least twenty neurotransmitters convey these signals to networks in various parts of the hypothalamus and in the rest of the brain (Cota et al., 2006; Woods et al., 2000).

Activity in a part of the neural network that passes through the *ventromedial nucleus* in the hypothalamus tells an animal that there is no need to eat. So if a rat’s ventromedial nucleus is stimulated, the animal will stop eating (Kent et al., 1994). However, if the ventromedial nucleus is destroyed, the animal will eat much more than usual and maintain a much higher body weight.

In contrast, the *lateral hypothalamus* participates in networks that tell an animal to start eating. So when the lateral hypothalamus is stimulated, rats begin to eat huge quantities, even if they have just had a large meal (Stanley et al., 1993). When the lateral hypothalamus is destroyed, however, rats stop eating almost entirely.

Decades ago, these findings led to the idea that these two hypothalamic regions interact to maintain some homeostatic level, or *set point*, based on food intake, body weight, or other eating-related signals (Powley & Keesey, 1970). According to set-point theory, each individual has a “fat thermostat” set by genetics, either at birth or shortly thereafter, to maintain a certain body weight (Keesey, 1980; Keesey & Powley, 1975). So normal animals eat until their set point is reached, then stop eating until desirable intake falls below the set point (Cabanac & Morissette, 1992).

This theory was too simplistic, however. Researchers found that rats with damage to the lateral hypothalamus would still eat very tasty foods, even though the damage never healed (Teitelbaum & Stellar, 1954). It appears that the brain’s control of eating involves more than just the interaction of a “stop-eating” and a “start-eating” area (Winn, 1995). For example, the *paraventricular nucleus* in the hypothalamus is also important. As with the ventromedial nucleus, stimulating the paraventricular nucleus reduces food intake. Damaging it makes animals obese (Leibowitz, 1992). In addition, hunger—and the eating of particular types of food—is related to the effects of various neurotransmitters on certain brain cells. One neurotransmitter, *neuropeptide Y*, stimulates increased carbohydrate eating (Kishi & Elmquist, 2005; Kuo et al., 2007). Another one, *serotonin*, suppresses

carbohydrate intake. *Galanin* motivates eating of high-fat food (Krykouli et al., 1990), and *enterostatin* reduces it (Lin et al., 1998). *Endocannabinoids* stimulate eating in general, especially tasty foods (e.g., DiPatrizio, Astarita et al., 2011). They affect the same hypothalamic receptors as the active ingredient in marijuana does, which may explain “the munchies,” a sudden hunger that marijuana use may create (Cota et al., 2003). *Peptide YY3–36* causes a feeling of fullness and reduced food intake (Batterham et al., 2002, 2003).

In short, several brain regions and chemicals regulate hunger and food selection. These internal regulatory processes are themselves affected by the physical environment (e.g., what foods are available), past experiences with foods, and, for humans, social and cultural traditions about eating.

Flavor, Sociocultural Experience, and Food Selection

Eating is powerfully affected by food’s *flavor*—the combination of taste and smell. In general, we eat more when differently flavored foods are served, as in a multicourse meal, than when only one food is served (Berry, Beatty, & Klesges, 1985; Remick, Polivy, & Pliner, 2009). Apparently the flavor of a food becomes less enjoyable as more of it is eaten (Swithers & Hall, 1994). In one study, participants rated how much they liked four kinds of food, then they ate one of the foods and rated all four again. The participants gave the food they had just eaten a lower rating the second time, but their liking increased for all the other foods (Johnson & Vickers, 1993). A similar finding occurred when just the shape of pasta was varied; recently eaten shapes were liked less than new ones (Rolls, Rowe, & Rolls, 1982).

The appearance and smell of certain foods also affect eating. These signals come to elicit conditioned physiological responses—including the secretion of saliva, digestive juices, and insulin—in anticipation of eating those foods (see the learning chapter for more on conditioned responses). So merely seeing a pizza on television may prompt you to order one. And if a delicious-looking cookie comes your way, you don’t have to be hungry to start eating it. In fact, many people who have just pronounced themselves “full” after a huge holiday meal still manage to find room for an appetizing dessert. In other words, we eat not just to satisfy nutritional needs but also because of *appetite*, the desire to experience enjoyment (Zheng et al., 2009).



Bon Appetit!

TRY THIS The definition of delicacy differs from culture to culture. Most people in the United States are unlikely to sit down to a plate of grasshoppers or mealworms, but 80 percent of the world’s population enjoys eating one or more of over 1,000 different insects (e.g., Ekpo, 2011; Gahukar, 2011) that provide a rich source of protein and essential amino acids (Melo et al., 2011). To appreciate your own food culture, make a list of foods that are traditionally valued by your family or cultural group but that people from other groups do not (or might even be unwilling to) eat.

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Eating is stimulated by other signals, too. Do you usually eat while reading or watching television? If so, you may find that merely settling down with a book or your favorite show can trigger a desire for a snack, even if you just finished dinner! This happens partly because situations associated with eating in the past can become signals to stimulate eating in the future (Epstein et al., 2009). Learned social rules and cultural traditions also influence eating. In North American culture, having lunch at noon, munching popcorn at movies, and eating hot dogs at ball games are common examples of how certain social situations can lead us to eat particular items at particular times.

How much you eat may also depend on what others do. Politeness or custom might prompt you to try foods you might otherwise avoid. Generally, the mere presence of others, especially friends and family, but even strangers, tends to increase the amount we eat and how long we eat (De Castro, 1990, 1994; Redd & de Castro, 1992). Most people consume 60 to 75 percent more food when they are with others than when eating alone (Clendenen, Herman, & Polivy, 1995), and the same effect occurs in other species, from monkeys to chickens (Galloway et al., 2005; Keeling & Hurink, 1996). If others stop eating, we may do the same even if we’re still hungry—especially if we want to impress them with our self-control (Herman, Roth, & Polivy, 2003). And people who are trying to diet are more likely to relapse when they’re with others who eat without restraint (Grilo, Schiffman, & Wing, 1989).

Celebrations, holidays, vacations, and even daily family interactions often revolve around food and what some call a *food culture* (Rozin, 2007). Food use and selection varies widely across cultures. For example, chewing coca leaves is popular in the Bolivian

highlands but illegal in the United States (Burchard, 1992). Many westerners find insects called palm weevils disgusting (Springer & Belk, 1994), but they are a food delicacy in Papua New Guinea (Paoletti, 1995), whereas the beef those same westerners enjoy is morally repugnant to devout Hindus in India. Even within the same culture, different groups may have sharply contrasting food traditions. Squirrel brains won't be found on most dinner tables in the United States, but some people in the rural American South consider them a tasty treat. In short, eating serves functions beyond nutrition—functions that help to remind us of who we are and with whom we identify.

Unhealthy Eating

Problems in the processes that regulate hunger and eating may cause *eating disorders* such as anorexia nervosa, bulimia, or binge eating disorder. While not considered an eating disorder, obesity can occur from too much food intake and is a significant health problem.

Obesity

The World Health Organization (WHO, 2002) defines **obesity** as a condition in which a person's body mass index (BMI) is greater than 30 (Yanovski & Yanovski, 2002). You can determine your BMI by dividing your weight by the square of your height. So someone who is 5 feet 2 inches and weighs 164 pounds would be classified as obese, as would someone 5 feet 10 inches who weighs 207 pounds. People with a BMI of 25 to 29.9 may be "overweight" but not obese. (Keep in mind, though, that a given volume of muscle weighs more than the same volume of fat, so very muscular individuals may have an elevated BMI without being overweight.)

Obesity is a major health problem (Koh, Blakey, & Roper, 2014). Using the BMI criterion, about 36 percent of adults in the United States are obese, as are about 17 percent of children and adolescents (Centers for Disease Control and Prevention, 2014). These percentages are even higher among the poor and members of some ethnic minority groups (Centers for Disease Control and Prevention, 2014; Ogden et al., 2014). Obesity has become so common that commercial jets have to burn excess fuel to carry heavier loads, the U.S. Coast Guard has reduced the number of passengers that boats are allowed to carry, the parents of obese young children have trouble finding car safety seats to fit them, and the funeral industry has had to offer larger coffins and purchase wider hearses (e.g., Associated Press, 2011; Nolin, 2011; Trifiletti et al., 2006). Though the problems of overweight and obesity are especially severe in the United States, they are growing worldwide. An analysis of data from 106 countries in Asia, Europe, South America, and Africa—comprising about 88 percent of the world's population—found that 23.2 percent of adults are overweight and another 10 percent are obese. Projections suggest that by 2030, over 1 billion obese people will be living in these countries (Kelly et al., 2008).

Obesity increases the risk of death (Flegal et al., 2013), with life expectancy reduced by an average of six to seven years (Haslam & James, 2005), in part by creating more risk of Type 2 diabetes, respiratory disorders, high blood pressure, cancer, heart attack, and stroke (Centers for Disease Control and Prevention, 2014). The medical and other costs of obesity in the workplace are more than \$73.1 billion per year (Finkelstein et al., 2010). Obesity, especially in adolescence, is also associated with anxiety and depression (e.g., Bell et al., 2011; Gariepy, Nitka, & Schmitz, 2010), though it is not yet clear whether the relationship is causal, and if it is, which condition might be causing which problem (Hilbert et al., 2014; Saguy, 2013).

Possible causes for our current obesity epidemic include big portion sizes in restaurants—especially fast-food outlets—the prevalence of high-fat foods, and reduced physical activity (e.g., Mozaffarian et al., 2011; Wansink & Wansink, 2010). These are important factors, because body weight is determined by a combination of food intake and energy output (Keesey & Powley, 1986). Obese people get more energy from food than their body metabolizes, or "burns up." The excess energy, measured in calories, is stored as fat. Obese

obesity A condition in which a person is severely overweight.

people tend to eat above-average amounts of high-calorie tasty foods but below-average amounts of less-tasty foods (Kauffman, Herman, & Polivy, 1995). Further, they may be less active than lean people, a pattern that often starts in childhood (Jago et al., 2005; Marshall et al., 2004; Strauss & Pollack, 2001). Spending long hours watching television or playing video games is a major cause of the inactivity seen in overweight children (e.g., Bickham et al., 2013), which may partly explain why children who have a TV in their bedrooms are more likely to be overweight than those who don't (Gilbert-Diamond et al., 2014).

In short, inadequate physical activity combined with overeating—especially of the high-fat foods so common in most Western cultures—has a lot to do with obesity (Arsenault et al., 2010). But not everyone who is inactive and eats a high-fat diet becomes obese, and some obese people are as active as lean people, so other factors must also exist (Blundell & Cooling, 2000; Parsons, Power, & Manor, 2005). Some people probably have a genetic predisposition toward obesity (e.g., Frayling et al., 2007; Llewellyn et al., 2014). For example, although most obese people have the genes to make leptin, they may not be sensitive to its weight-suppressing effects, perhaps because of differing genetic codes for leptin receptors in the hypothalamus. Brain-imaging studies also suggest that obese people's brains may be slower to "read" satiety signals coming from their blood, thus causing them to continue eating when leaner people would have stopped (Morton et al., 2006; Thorens, 2008). They may also be more sensitive to the rewards of eating (Stice et al., 2011). These genetic factors may help explain obese people's tendency to eat more, accumulate fat, and feel hungrier than lean people. Also, chronic intake of a high-fat, high-sugar "western" diet may not only increase weight but also cause problems in memory and other cognitive processes that may in turn affect regulation of food intake (Kanoski & Davidson, 2011).

Other factors affecting obesity include learning from the examples set by parents who overeat (Hood et al., 2000), too little parental control over what and how much children eat (Cooper & Warren, 2011; Johnson & Birch, 1994), impulsivity (Churchill, Jessop, & Sparks, 2008), or over-responsiveness to high-fat "comfort foods" (Hofmann et al., 2010; Troisi & Gabriel, 2011). Many people eat more when under stress, a reaction that may be especially extreme in those who become obese (Dallman et al., 2003; Friedman & Brownell, 1995).



Unhappy Meals

TRY THIS A report from the Feeding Infants and Toddlers Study found that toddlers in the United States prefer French fries to any other vegetable, that one in five babies eats candy every day, and that 44 percent of babies consume sugary drinks (Fox et al., 2004). Children's preference for high-fat fast food is so well learned that when children in one experiment were given identical foods wrapped either in plain paper or in paper bearing the logo of a popular fast-food restaurant, they rated the restaurant-branded food as tasting better (Robinson et al., 2009). Changing these habits and preferences will not be easy, but the need to do so is obvious and urgent. Take a look at the nutrition information on packages of your favorite foods. If the fat and sugar content seems excessive, make a list of some alternative choices that might make your eating habits healthier.

The food passionates/Corbis

Most people, especially those who are obese, find it easier to gain weight than to lose it and keep it off (Jain, 2005; McTigue et al., 2003). For this we can probably blame our evolutionary ancestors who—like nonhuman animals in the wild today—could not always count on food being available. Those who survived lean times were the ones whose genes created tendencies to build and maintain fat reserves (King, 2013). These "thrifty genes" are adaptive in famine-plagued environments but now may be harmful and even deadly in affluent societies where overeating is unnecessary and fast food is on every corner. Further, if people starve themselves to lose weight, their bodies learn to burn calories more slowly. This drop in metabolism saves energy and fat reserves and slows weight loss (Leibel, Rosenbaum, & Hirsch, 1995). Restricted eating also activates the brain's "pleasure centers" when a hungry person even looks at energy-rich food (Siep et al., 2009), making restraint that much more difficult. It is no wonder, then, that health experts warn that we should not try to lose a great deal of weight quickly by dramatically cutting food intake (Carels et al., 2008).

Researchers keep looking for safe and effective medications to treat obesity (Yanovski & Yanovski, 2014). The drugs now available act either to suppress appetite or increase fat burning (e.g., Gilbert et al., 2012; Witkamp, 2011), and millions of people take them (Neovius & Narbro, 2008). A more radical approach is *bariatric surgery*, which restructures the stomach and intestines so that less food energy is absorbed and stored (Hamad, 2004; Vetter et al., 2009). Bariatric surgery can be effective (Courcoulas et al., 2013), but due to its costs and risks—postoperative mortality rates range from 0.1 to 2 percent (Skroubis et al., 2011; Steele et al., 2011)—it is recommended only for extreme cases of obesity that are not helped by more conservative treatments.



Thin Is In

In Western cultures today, thinness is a much sought-after ideal, especially among young women. This ideal is seen in fashion models as well as in beauty pageant contestants, whose body mass index has decreased from the "normal" range of 20 to 25 in the 1920s to an "undernourished" 18.5 in recent years (Rubinstein & Caballero, 2000; Voracek & Fisher, 2002). In the United States, 35 percent of normal-weight girls—and 12 percent of underweight girls!—begin dieting when they are as young as age nine or ten. Correlational studies suggest that the efforts of many of these children to lose weight may have come in response to criticism from family members (Barr Taylor et al., 2006a; Schreiber et al., 1996); for some, the result is anorexia. To combat the problem, some fashion shows have established a minimum BMI for all models, and Israel bans the use of underweight models in advertising (New Israeli Law, 2012).

Jack Guez/Afp/Getty Images

anorexia nervosa An eating disorder characterized by self-starvation and dramatic weight loss.

bulimia An eating disorder that involves eating massive quantities of food, then eliminating it by self-induced vomiting or laxatives.

No single anti-obesity treatment is a safe, effective solution that works for everyone. Even when people lose weight through diet and exercise and have a strong desire to maintain their healthier behaviors, many people regain what they lost (Burnette & Finkel, 2012; Gipson et al., 2014). To achieve the kind of weight loss that is most likely to last, obese people are advised to make gradual lifestyle changes in addition to (or instead of) seeking medical solutions. These changes can be as simple as limiting the number of available foods, eating from smaller plates, buying lower-fat foods in smaller packages, and fasting one day a week (Levitsky, Iyer, & Pacanowski, 2012). The most effective weight-loss programs include components designed to reduce food intake, change eating habits and attitudes toward food, and increase energy expenditure through regular exercise (Bell et al., 2011; Dombrowski et al., 2014; Shamah et al., 2012). Exercise is especially important because it burns calories while raising metabolism instead of lowering it, as reducing food intake alone does (Curioni & Lourenço, 2005).

Of course, the ultimate remedy for obesity is prevention, which will require parents and others to promote exercise and healthy eating habits in children from an early age.

Anorexia Nervosa

In stark contrast to the problem of obesity is the eating disorder known as **anorexia nervosa**. It is characterized by some combination of self-starvation, self-induced vomiting, excessive exercise, and laxative use that results in weight loss to below 85 percent of normal (Kaye et al., 2000). Anorexia affects about 0.5 to 1 percent of young people in the United States, and it is a significant problem in many other industrialized nations as well (Currin, 2005; Hoek, 2006; Hudson et al., 2007). About 95 percent of those who suffer from anorexia are young women. People with anorexia often feel hungry, and many are obsessed with food and its preparation yet they refuse to eat. Anorexic self-starvation causes serious, often irreversible, physical damage, including reduction in bone density that increases the risk of fractures (Grinspoon et al., 2000). The health dangers may be especially high in anorexic dancers, gymnasts, and other female athletes, who are at risk for stress fractures and heart problems (e.g., Van Durme, Goossens, & Braet, 2012). It is estimated that from 4 to 30 percent of those suffering severe anorexia eventually die of starvation, biochemical imbalances, or suicide; their death rate is six to twelve times higher than the death rate for other young women (National Association of Anorexia Nervosa and Associated Disorders, 2002; Suokas et al., 2013).

Anorexia has been attributed to many factors, including genetic predispositions, hormonal and other biochemical imbalances, social influences, and psychological problems (e.g., Kaye et al., 2013; Treat & Viken, 2010; Wasylkiw, MacKinnon, MacLellan, 2012). Those psychological factors may include a self-punishing, perfectionistic personality and a culturally reinforced obsession with thinness and attractiveness (e.g., American Psychological Association Task Force on the Sexualization of Girls, 2007; Juarascio et al., 2011; Steinglass et al., 2012). People with anorexia appear to be afraid of being fat and take that worry to dangerous extremes. Many still view themselves as fat or misshapen even as they waste away.

Drugs, hospitalization, and psychotherapy are all used to help relieve anorexia (Herpertz et al., 2011). In many cases, treatment brings recovery and the maintenance of normal weight (e.g., Brewerton & Costin, 2011a, b; Steinglass et al., 2012), but more effective treatments and early intervention methods are still needed.

Bulimia

Like anorexia, the eating disorder called bulimia (pronounced "bu-LEE-mee-uh") involves an intense fear of being fat, but the person may be thin, normal in weight, or even overweight. **Bulimia** (also referred to as *bulimia nervosa*) involves eating huge amounts of food (say, several boxes of cookies, a half-gallon of ice cream, and a bucket of fried

chicken) and then getting rid of the food through self-induced vomiting or strong laxatives. These “binge-purge” episodes may occur as often as twice a day (Weltzin et al., 1995).

Bulimia shares many features with anorexia (Fairburn et al., 2008). For instance, most bulimics are women, and like anorexia, bulimia usually begins with a desire to be slender. However, most people with bulimia see their eating habits as problematic, whereas most people with anorexia do not (Eddy et al., 2008). Also, bulimia is usually not life threatening (Thompson, 1996). It has consequences, however, that include dehydration, nutritional problems, and intestinal damage (e.g., Abraham & Kellow, 2011; Li et al., 2011; Mehler, 2011). Many people with bulimia develop dental problems from the acids in vomit (Schlueter et al., 2012). Frequent vomiting and the insertion of objects to cause it can also damage the throat.

In the United States about 1 to 3 percent of adolescent and college-age women have bulimia (Hudson et al., 2007), a figure that has remained fairly stable since the early 1990s (Crowther et al., 2008). A combination of factors contributes to bulimia, including perfectionism, high achievement orientation, low self-esteem, stress, a cultural preoccupation with being thin, and emotional problems (de Souza, Mussap, & Cummins, 2010). Problems in the brain’s satiety mechanisms may also be involved (e.g., Stice, Marti, & Durant, 2011; Zalta & Keel, 2006). Treatment for bulimia, which typically includes individual or group psychotherapy and, sometimes, antidepressant drugs, helps most people with this disorder (e.g., Brewerton & Costin, 2011a, b; Herpertz et al., 2011).

Binge Eating Disorder

Individuals with **binge eating disorder** engage in food binges but do not display the purging pattern seen in bulimia. Unlike “compulsive overeating,” people with binge eating disorder do not feel a general desire to overeat and do not usually fantasize about food. Instead, they experience episodes in which they suddenly and uncontrollably eat huge quantities of food, usually in less than two hours, several times a week (Hudson et al., 2006). It appears that individuals with binge eating disorder are more likely than those with anorexia or bulimia to have problems such as depression, anxiety disorders, and substance abuse (Swanson et al., 2011). There is some evidence, too, that binge eating disorder may run in families, though the nature of any genetic influences is not yet clear (Trace et al., 2013). Nongenetic factors likely play some role, though, since the binge behavior is more common after people “recover” from a very restrictive diet (Tuschl, 1990). The lifetime risk of binge eating disorder may be about 2 percent in the United States (Smink, van Hoeken, & Hoek, 2013). Prescription medications combined with psychotherapy represent the best currently available treatment options, though results are mixed (Brownley et al., 2007; Reas & Grilo, 2014; Wilson, 2011).

For a summary of the processes involved in hunger and eating, see “In Review: Major Factors Controlling Hunger and Eating.”

IN REVIEW

MAJOR FACTORS CONTROLLING HUNGER AND EATING

Theory	Stimulate Eating	Inhibit Eating
Biological factors	Hormones released into the bloodstream provide signals that stimulate eating. Signals in the blood such as ghrelin and glucose affect neurons in the hypothalamus and stimulate eating, including hungers for specific kinds of foods, such as fats and carbohydrates. The lateral nucleus of the hypothalamus may be a “hunger center” that monitors these hormonal signals in the blood.	Hormones released into the bloodstream provide signals that inhibit eating. Signals in the blood such as leptin and insulin affect neurons in the hypothalamus and inhibit eating. The ventromedial nucleus of the hypothalamus may be a “satiety center” that monitors these hormonal signals in the blood.

(continued)

IN REVIEW

MAJOR FACTORS CONTROLLING HUNGER AND EATING (CONT.)

Theory	Stimulate Eating	Inhibit Eating
Nonbiological factors	Sights and smells of particular foods elicit eating because of prior associations. Family customs and social occasions often include norms for eating in particular ways.	Values in contemporary U.S. society encourage thinness and thus can inhibit eating.

In Review Questions

1. People may eat when they are "full," suggesting that eating is not controlled by _____ alone.
2. People who binge and purge have an eating disorder called _____. Those who only binge have a disorder called _____.
3. The best strategy for lasting weight loss includes regular _____ as well as improved eating habits.

SEXUAL BEHAVIOR

How often does the average person have sex?

Unlike food, sex is not necessary for an individual's survival, but it improves the chances that a person's genes will make it to the next generation. The many factors that shape sexual motivation and behavior differ in strength across species. These factors can include physiology, evolutionary forces, learned behavior, and physical and social environments. For example, one species of desert bird requires adequate sex hormones, a suitable mate, and a particular environment before it engages in sexual behavior. As long as the dry season lasts, it shows no interest in sex, but within ten minutes of the first rainfall, the birds vigorously court and copulate.

Rainfall is obviously much less influential as a sexual trigger for humans. In fact, people show an amazing diversity of *sexual scripts*, the step-by-step sequences of thoughts and events that lead to sexual behavior (Simon & Gagnon, 1986). Surveys of college-age men and women have identified 122 specific acts, 34 different tactics, and 237 stated reasons surrounding their efforts to have sex (Greer & Buss, 1994; Meston & Buss, 2007). What actually happens during sex? The matter is exceedingly difficult to address scientifically, partly because most people are reluctant to allow researchers to observe their sexual behavior. Many won't even answer questions about their sexual practices. Yet having valid information about the nature of human sexual behavior is a vital first step for psychologists and other scientists who study such topics as individual differences in sexuality, gender differences in sexual motivation and behavior, sources of sexual orientation, disturbances of sexual functioning, and pathways through which AIDS and other sexually transmitted diseases reach new victims. This information can also help people think about their own sexual behavior in relation to trends in the general population.

The Biology of Sex

Observations in Masters and Johnson's laboratory led to important findings about the **sexual response cycle**, the pattern of physiological arousal before, during, and after sexual activity (see Figure 10.2). Masters and Johnson (1966) found that men show one primary pattern of sexual response but women display at least three different patterns from time to time. In both men and women, the first, or *excitement*, phase begins with sexually stimulating input from the environment or from one's own thoughts. Further stimulation leads to intensified excitement in the second, or *plateau*,

binge eating disorder A pattern of sudden, recurrent episodes of eating huge amounts of food, but without purging.

sexual response cycle The pattern of arousal before, during, and after sexual activity.

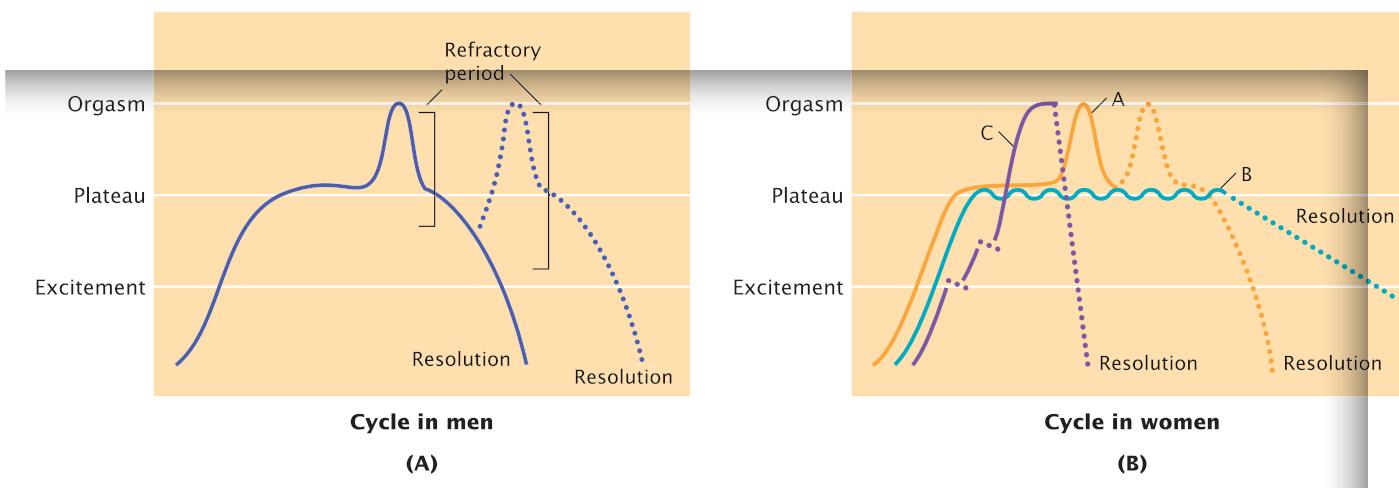


FIGURE 10.2
The Sexual Response Cycle

Masters and Johnson (1966) found that men show one primary pattern of sexual response, depicted in Part A, and that women display at least three different patterns from time to time—labeled A, B, and C in Part B.

FOCUS ON RESEARCH METHODS

A SURVEY OF HUMAN SEXUAL BEHAVIOR

The first extensive studies of sexual behavior in the United States were done in the 1950s and 1960s by Alfred Kinsey (Kinsey, Pomeroy, & Martin, 1948; Kinsey et al., 1953) and William Masters and Virginia Johnson (1966). In the Kinsey studies, volunteers answered questions about their sexual practices, whereas Masters and Johnson actually recorded volunteers' **sexual arousal**, their physiological responses during natural or artificial sexual stimulation in a laboratory. Together, these pioneering studies broke new ground to explain human sexuality.

However, the people who volunteered for them were probably not a representative sample of the adult population. So the results and conclusions drawn from them might not apply to people in general. Further, the data are now so old that they may not reflect sexual practices today. Unfortunately, results of more recent surveys, such as reader polls in *Cosmopolitan* and other magazines, are flawed because their samples are also not representative (Davis & Smith, 1990).

What was the researchers' question?

Is it possible to gather data about sexual behavior that are more representative and therefore more applicable to people in general? A team of researchers at the University of Chicago believe it is, so they undertook the National Health and Social Life Survey, the first extensive survey of sexual behavior in the United States since the Kinsey studies (Laumann et al., 1994).

How did the researchers answer the question?

This survey included important design features that had been neglected in most other surveys of sexual behavior. First, the study did not depend on self-selected volunteers. The researchers sought out a particular sample of 3,432 people who ranged in age from 18 to 59. Second, the sample was carefully constructed so as to reflect the sociocultural diversity of the U.S. population in terms of gender, ethnicity, socioeconomic status, geographical location, and the like. Third, unlike previous surveys that had relied on mail-in responses from participants, the Chicago study was based on face-to-face interviews. This approach made it easier to ensure that the participants understood each question and allowed them to explain their responses. To encourage honesty, the researchers let participants answer some of the survey's questions anonymously by placing written responses in a sealed envelope.

(continued)

sexual arousal Physiological arousal that arises from sexual contact or erotic thoughts.

What did the researchers find?

For one thing, the researchers found that people in the United States have sex less often and with fewer partners than many had assumed. For most, sex occurs about once a week and almost always with the partner with whom they share a stable relationship. About a third of the participants reported having had sex only a few times (or not at all) in the preceding year. And, in contrast to various celebrities' splashy tales of dozens, even hundreds, of sexual partners per year, the average male survey participant had had only six sexual partners in his entire life. The average female respondent reported a lifetime total of two. Further, the survey data suggested that people in committed, one-partner relationships had the most frequent and the most satisfying sex. And although a wide variety of specific sexual practices were reported, the overwhelming majority of heterosexual couples said that they tend to engage mainly in penis-vagina intercourse. Many of these findings are consistent with the results of more recent surveys conducted by other researchers (e.g., National Center for Health Statistics, 2007).

What do the results mean?

The Chicago survey challenges some of the cultural and media images of sexuality in the United States. In particular, it suggests that people in the United States may be more sexually conservative than one might think on the basis of magazine reader polls and the testimony of guests on daytime talk shows.

What do we still need to know?

Many questions remain. The Chicago survey did not ask about some of the more controversial aspects of sexuality, such as the effects of pornography or the role in sexual activity of sexual fetishes such as shoes or other clothing. Had the researchers asked about such topics, their results might have painted a different picture. Further, because the Chicago survey focused on people in the United States, it told us little or nothing about the sexual practices, traditions, and values of people in the rest of the world.

The Chicago team continued to conduct interviews after their initial effort to fill in the picture about sexual behavior in the United States and around the world (Youm & Laumann, 2002). They found, for example, that nearly one-quarter of U.S. women prefer to achieve sexual satisfaction without partners of either sex. And although people in the United States tend to engage in a wider variety of sexual behaviors than do those in Britain, people in the United States appear to be less tolerant of disapproved sexual practices (Laumann & Michael, 2000; Michael et al., 1998). They have found, too, that although sexual activity declines with advancing age, it by no means disappears. Between 26 and 33 percent of people in the 75 to 95 age group—especially men—reported that they were still sexually active (e.g., Hyde et al., 2010).

Other researchers have found a number of consistent gender differences in sexuality (Basson, 2001; Schmitt et al., 2012). For example, men are more likely than women to mistake another person's friendliness for sexual interest (Perilloux, Easton, & Buss, 2012). This may be because men tend to have a stronger interest in and desire for sex than women, whereas women are more likely than men to associate sexual activity with love and to be affected by cultural and situational influences on sexual attitudes and behavior (e.g., Diamond, 2008; Petersen & Hyde, 2010). Many such differences are actually quite small, and, according to some studies, not necessarily significant (Conley et al., 2011).

The results of even the best survey methods—like those of the best of all other research methods—usually raise many questions. When do people get interested in sex, and why? How do they express these desires, and why? What determines their sexual likes and dislikes? How do learning and sociocultural factors modify the biological forces that seem to provide the raw material of human sexual motivation? These are some of the questions about human sexual behavior that a survey cannot easily or accurately explore (Benson, 2003).

phase. If stimulation continues, the person reaches the third, or *orgasmic*, stage. Although orgasm lasts only a few seconds, it provides an intensely pleasurable release of physical and psychological tension. The *resolution* phase follows, during which the person returns to a state of relaxation. At this point, men enter a *refractory period*, during which they are temporarily unable to be aroused. Women are capable of immediately repeating the cycle if stimulation continues.

People's motivation to engage in sexual activity is influenced by **sex hormones**. Three classes of hormones are most directly related to sexual behavior: **estrogens**, **progestational hormones** (also called **progesterins**), and **androgens**. The main estrogen is *estradiol*, the main progestin is *progesterone*, and the main androgen is *testosterone*. Each sex hormone flows in the blood of both sexes, but males have relatively more androgens than estrogens or progesterins, and women have relatively more estrogens and progesterins than androgens.

Sex hormones have both *organizing* and *activating* effects on the brain. The organizing effects are permanent changes in the brain that influence the brain's response to hormones. The activating effects are temporary behavioral changes that last only as long as the level of a sex hormone is elevated, such as in the ovulation phase of the monthly menstrual cycle. In mammals, including humans, the organizing effects of hormones occur around the time of birth. It is then that certain brain areas are sculpted into a "female-typical" or "male-typical" pattern. For example, a brain area called *BnST* is generally larger in men than in women. Its possible role in some aspects of human sexuality was suggested by a study that compared the brains of men with a male gender identity to those of male-to-female transsexuals (genetic males who feel like women and may request surgery and hormone treatments to create more feminine bodies). The *BnST* was larger in the male-identified men than in the transsexuals. In fact, the transsexuals' *BnST* was about the size usually seen in women (Zhou et al., 1995). This result has not been replicated in more recent research, however (Savic & Aryer, 2011).

Rising levels of sex hormones during puberty activate increased sexual desire and interest in sexual behavior. Generally, estrogens stimulate females' sexual interest, especially in more masculine-looking men, and increase the accuracy of their judgments of men's sexual orientation (Durante et al., 2012; Roney & Simmons, 2008; Rule et al., 2011). Androgens raise males' sexual interest (Davidson, Camargo, & Smith, 1979), but they may also do so in females (Sherwin & Gelfand, 1987). The activating effects of hormones are also seen in reduced sexual motivation and behavior among people whose hormone-secreting ovaries or testes have been removed for medical reasons. Injections of hormones help restore these people's sexual interest and activity (Sherwin, Gelfand, & Brender, 1985).

Generally, hormones affect sexual desire, not the physical ability to have sex (Wallen & Lovejoy, 1993). This fact may explain why castration (removal of the testes) does not prevent sex crimes by male offenders. Men with low testosterone levels due to medical problems or castration show less sexual desire but still have erections in response to erotic stimuli (Kwan et al., 1983). So a sex offender treated by chemical or physical castration might be less likely to seek out sex, but he would still respond as before to his favorite sexual stimuli (Wickham, 2001).

sex hormones Chemicals in the blood that organize and motivate sexual behavior.

estrogens Feminine hormones that circulate in the bloodstream.

progestational hormones (progesterins) Feminine hormones that circulate in the bloodstream.

androgens Masculine hormones that circulate in the bloodstream.

Social and Cultural Factors in Sexuality

Human sexuality is shaped not only by hormones but also by a lifetime of learning and thinking. For example, children learn some of their sexual attitudes and behaviors as part of the development of *gender roles*, as described in the human development chapter. The specific attitudes and behaviors they learn depend partly on the nature of gender roles in their culture (Petersen & Hyde, 2010).

There are also differences in what women and men find sexually arousing. For example, in many cultures, men are far more interested in and responsive to erotic visual images than women are (e.g., Petersen & Hyde, 2010). A biological basis for this difference

was investigated in a study that scanned the brain activity of males and females while they looked at erotic photographs (Hamann et al., 2004). The men showed greater activity in the amygdala and hypothalamus than the women did. But even though there were gender differences in brain activity, the male and female participants rated the photos as equally attractive and sexually arousing. In another study, when men reported sexual arousal in response to erotic films, they showed signs of physiological arousal, too. For women, self-reports of sexual arousal were not strongly correlated with signs of physiological arousal (Chivers et al., 2004). Further, though men and women both show more sexual arousal to more intensely erotic films, the level of women's arousal may not depend as much as men's does on whether the actors are males or females (Chivers, Seto, & Blanchard, 2007). A third study found that women were aroused by a wider range of sexual stories than men were (Suschinsky & Lalumière, 2011).

These are just a few examples of the fact that a complex mixture of factors produces sexuality. Each person's learning history, cultural background, and perceptions of the world interact so deeply with such a wide range of physiological processes that—as in many other aspects of human behavior and mental processes—it is impossible to separate their influence on sexuality. Nowhere is this point clearer than in the case of sexual orientation.

Sexual Orientation

Sexual orientation refers to the nature of a person's enduring emotional, romantic, or sexual attraction to others (American Psychological Association, 2002a; Ellis & Mitchell, 2000). The most common sexual orientation is **heterosexuality**, in which the attraction is to members of the opposite sex. When attraction focuses on members of one's own sex, the orientation is called **homosexuality**, more specifically, gay (for men) and lesbian (for women). **Bisexuality** refers to the orientation of people who are attracted to members of both sexes. Sexual orientation involves feelings that may or may not be translated into corresponding patterns of sexual behavior (Pathela et al., 2006). For example, some people whose orientation is gay, lesbian, or bisexual may have sex only with opposite-sex partners. Similarly, people whose orientation is heterosexuality may have had one or more same-sex encounters.

In many cultures, heterosexuality has long been regarded as a moral norm, and homosexuality has been cast as a disease, a mental disorder, or even a crime (Hooker, 1993). Yet there is no good evidence that efforts to alter the sexual orientation of gay men and lesbians—using psychotherapy, brain surgery, or electric shock—are effective (American Psychiatric Association, 1999; American Psychological Association, 2008; King, Smith, & Bartlett, 2004). In 1973, the American Psychiatric Association dropped homosexuality from the *Diagnostic and Statistical Manual of Mental Disorders*, thus ending its official status as a form of psychopathology. The same change was made by the World Health Organization in its *International Classification of Diseases* in 1993, by Japan's psychiatric organization in 1995, and by the Chinese Psychiatric Association in 2001.

Nevertheless, some people still disapprove of homosexuality. Gays, lesbians, and bisexuals are often the victims of discrimination and even hate crimes, so many are reluctant to let their sexual orientation be known. It is difficult, therefore, to obtain an accurate picture of the mix of heterosexual, gay, lesbian, and bisexual orientations in a population. In the Chicago sex survey mentioned earlier, 1.4 percent of women and 2.8 percent of men identified themselves as exclusively gay or lesbian (Laumann et al., 1994). These figures are much lower than the 10 percent found earlier in Kinsey's studies. However, the Chicago survey's face-to-face interviews did not allow respondents to give anonymous answers to questions about sexual orientation. Some suggest that if anonymous responses had been permitted, the prevalence figures for gay, lesbian, and bisexual orientations would have been higher (Bullough, 1995). In fact, studies that have allowed anonymous responding estimate that gay, lesbian, and bisexual people make up between 2 and 21 percent of the population in the United States, Canada, and Western Europe (e.g., Aaron et al., 2003; Hayes et al., 2012; Savin-Williams, 2006).

heterosexuality Sexual desire or behavior that is focused on members of the opposite sex.

homosexuality Sexual desire or behavior that is focused on members of one's own sex.

bisexuality Sexual desire or behavior that is focused on members of both sexes.

THINKING CRITICALLY

WHAT SHAPES SEXUAL ORIENTATION?

The question of where sexual orientation comes from is a topic of intense debate in scientific circles, on talk shows, in Internet chat rooms, and in everyday conversations.

What am I being asked to believe or accept?

Some people believe that genes exert a major influence on our sexual orientation. According to this view, we do not learn or choose a sexual orientation but rather are born with a strong predisposition to develop a particular orientation.

What evidence is available to support the assertion?

In 1995, a report by a respected research group suggested that one kind of sexual orientation—namely, that of gay men—is associated with a particular gene on the X chromosome (Hu et al., 1995). This specific finding was not supported by later studies (Rice et al., 1999), but other research in behavioral genetics strongly suggests that some kind of genetic influence must affect sexual orientation in humans (e.g., Kendler et al., 2000; Rice, Friberg, & Gavrilets, 2012). One study examined pairs of monozygotic male twins (whose genes are identical), pairs of dizygotic, or nonidentical, twins (whose genes are no more alike than those of any pair of brothers), and pairs of adopted brothers (who are genetically unrelated). To participate in this study, at least one brother in each pair had to be gay. As it turned out, the other brother was also gay or bisexual in 52 percent of the identical twin pairs but in only 22 percent of the non-identical pairs and in just 11 percent of the adoptive pairs (Bailey & Pillard, 1991). Similar findings are seen in male identical twins raised apart, where a shared sexual orientation cannot be due to a shared environment (Whitam, Diamond, & Martin, 1993). Studies of female sexual orientation have yielded similar results (Bailey & Benishay, 1993; Bailey, Dunne, & Martin, 2000).

Sex hormones may provide another biological influence on sexual orientation. In adults, different levels of these hormones are not generally associated with different sexual orientation. However, hormonal differences during prenatal development might be involved (Lippa, 2003; Mustanski et al., 2002). For example, one study found that women—but not men—who had been exposed to high levels of androgens during fetal development were much more likely to report bisexual or homosexual behaviors or fantasies than were their relatives of the same sex who had not been exposed (Meyer-Bahlburg et al., 2008).

Another line of research focuses on the possibility that previous pregnancies might permanently affect a woman's hormones in ways that influence the sexual orientation of her next child (Blanchard, 2001). Some evidence for this hypothesis comes from a study showing that the more older biological brothers a man has, the higher is the probability he will have a homosexual orientation (Bogaert & Skorska, 2011). These results appear to reflect mainly hormonal rather than mainly environmental influences, because the number of *nonbiological*

A Committed Relationship, with Children

Like heterosexual relationships, gay and lesbian relationships can be brief and stormy or stable and long lasting (Kurdek, 2005). These gay men are committed to each other for the long haul, as evidenced by their decision to adopt two children together. The strong role of biological factors in sexual orientation is seen in research showing that these children's orientation will not be influenced much, if at all, by that of their adoptive parents (e.g., Patterson, 2004, 2009; Pennington & Knight, 2011).

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(continued)

(adopted) brothers that the men had was not predictive of their sexual orientation. Further, because sexual orientation in women appeared not to be predicted by the number and gender of their older biological siblings, it was at first thought that the hormonal consequences of carrying male fetuses might only influence males' sexual orientation. The picture is not that simple, though. Other researchers have found that women's sexual orientation, too, is related to the number of older biological brothers they have (McConaghy et al., 2006), and still others have reported a relationship between men's sexual orientation and the number of older biological sisters they have (Francis, 2008; Vasey & VanderLaan, 2007). We don't yet know exactly how prenatal hormonal influences might operate to affect sexual orientation, but studies of nonhuman animals have found that such influences alter the structure of the hypothalamus, a brain region known to underlie some aspects of sexual functioning (Swaab & Hofman, 1995).

Finally, a biological basis for sexual orientation is suggested by the fact that sexual orientation is not predicted by environmental factors. For example, the sexual orientation of children's caregivers has little or no effect on those children's own orientation. Several studies have shown that children adopted by homosexual parents are no more or less likely to display a homosexual orientation than are children raised by heterosexual parents (e.g., Anderssen, Amlie, & Ytteroy, 2002; Bailey et al., 1995).

Are there alternative ways of interpreting the evidence?

Like all correlational data, correlations between genetics and sexual orientation are open to alternative interpretations. As discussed in the introductory chapter, a correlation describes the strength and direction of the relationship between two variables, but it does not guarantee that one variable actually influences the other. Consider again the data showing that the brothers who shared the most genes (identical twins) were also most likely to share a gay orientation. What they shared was probably not a "gay gene" but rather a set of genes that influenced the boys' activity levels, emotionality, aggressiveness, and the like. One example is gender conformity/nonconformity in childhood, the tendency for children to either conform or not conform to the behaviors, interests, and appearance that are typical for their gender in their culture. Such general aspects of their temperaments or personalities in childhood—and other people's reactions to them—could influence the emergence in later life of a particular sexual orientation (Bem, 2000). In other words, sexual orientation could arise as a reaction to the way people respond to a genetically determined but nonsexual aspect of personality. The influence of prenatal hormone levels could also influence sexual orientation by shaping aggressiveness or other nonsexual aspects of behavior.

It is also important to look at behavioral genetics evidence for what it can tell us about the role of *environmental* factors in sexual orientation. When we read a study showing that 52 percent of the time, both members of identical-twin pairs have a gay, lesbian, or bisexual orientation, it is easy to ignore the fact that the sexual orientation of the twin pair members differed in 48 percent of the cases. Viewed in this way, the results suggest that genes do not tell the entire story of sexual orientation. In other words, it is not determined by unlearned, genetic forces alone. As described in the chapter on biological aspects of psychology, the brains and bodies we inherit are quite responsive to environmental influences. In fact, the behaviors we engage in and the experiences we have often result in physical changes in the brain and elsewhere (Wang et al., 1995). For example, physical changes occur in the brain's synapses as we form new memories. So differences seen in the brains of adults with differing sexual orientations could be the effect, not the cause, of their behavior or experiences.

What additional evidence would help evaluate the alternatives?

Much more evidence is needed regarding the role of genes in shaping sexual orientation. We also have a lot to learn about the extent to which genes and hormones shape physical and psychological characteristics that lead to various sexual orientations. In studying these topics, researchers will want to learn more about the genetic makeup, mental style, and behavioral characteristics of people with different sexual orientations. Are there personality characteristics associated with particular sexual orientations? If so, do those characteristics have a strong genetic component? To what extent are heterosexuals, gays, lesbians, and bisexuals similar—and different—in terms of biases, coping skills, developmental histories, and the like (Bailey,

(continued)

Dunne, & Martin, 2000)? The more we learn about sexual orientation in general, the easier it will be to interpret data relating to its origins.

Yet even classifying sexual orientation is not simple, because people do not always fall into sharply defined categories (Thompson & Morgan, 2008; Worthington et al., 2008). Should a man who identifies himself as gay be considered bisexual because he occasionally has heterosexual daydreams? What sexual orientation label would be appropriate for a forty-year-old woman who experienced a few lesbian encounters in her teens but has engaged in exclusively heterosexual sex since then? Progress in understanding the origins of sexual orientation would be enhanced by a generally accepted system for describing and defining all facets of exactly what is meant by the term *sexual orientation* (Klein, 1990; Stein, 1999).

What conclusions are most reasonable?

The evidence available so far suggests that genetic factors, possibly including effects on prenatal hormones, create differences in the brains of people with different sexual orientations. However, the manner in which a person expresses a genetically influenced sexual orientation will be profoundly shaped by what that person learns through social and cultural experiences. In short, as with other psychological phenomena, sexual orientation reflects the complex interplay of both genetic and nongenetic mechanisms—of both nature and nurture.

ACHIEVEMENT MOTIVATION

Why do some people try harder than others to succeed?

The next time you visit someone's home or office, notice the mementos displayed. Perhaps there are framed diplomas and awards, trophies and ribbons, and photos of children and grandchildren. These badges of achievement affirm that a person has accomplished tasks that merit approval or establish worth. Much of human behavior is motivated by a desire for approval, admiration, and a sense of achievement—in short, for esteem—from others and from within. In this section, we examine two of the most common avenues to esteem: achievement in general and achievement in one's work.

Need for Achievement

Many athletes who already hold world records still train intensely; many people who have built multimillion-dollar businesses still work fourteen-hour days. What motivates these people? One answer is **achievement motivation** (also called the **need for achievement**)—the desire to do well in relation to some standard of excellence (McClelland et al., 1953; Murray, 1938). People with high achievement motivation seek to master tasks—such as sports, business ventures, occupational skills, intellectual puzzles, or artistic creation—and feel intense satisfaction from doing so. They work hard at striving for excellence, enjoy themselves in the process, and take great pride in achieving at a high level. For individuals with low achievement motivation, standards of excellence tend to create avoidance as well as anxiety, worry, and the anticipation of shame (Bjornebekk, Gjesme, & Ulriksen, 2011).

Individual Differences

How do people with strong achievement motivation differ from others? To find out, researchers gave children a test to measure their need for achievement (Figure 10.3 shows a test for adults) and then asked them to play a ring-toss game. Most of the children who scored low on the need-for-achievement test stood either so close to the ring-toss target that they couldn't fail or so far away that they could not succeed. In contrast, children scoring high on the need-for-achievement test stood at a moderate distance from the target, making the game challenging but not impossible (McClelland, 1958).

Experiments with adults and children suggest that people with high achievement needs tend to set challenging but realistic goals. They actively seek success, take risks when necessary, can wait for rewards, and are intensely satisfied when they do well (Mayer & Sutton, 1996). Yet if they feel they have tried their best, people with high achievement



FIGURE 10.3
Assessing Achievement Motivation

This picture is similar to those included in the Thematic Apperception Test, or TAT (Morgan & Murray, 1935). The strength of people's achievement motivation is inferred from the stories they tell about TAT pictures. A response like "The boy is thinking about playing his violin in concert at Carnegie Hall" would be seen as reflecting high achievement motivation.

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motivation are not too upset by failure. Those with low achievement motivation also like to succeed, but instead of joy, success tends to bring them relief at having avoided failure (Winter, 1996). Indeed, there is some evidence that the differing emotions—such as anticipation versus worry—that accompany the efforts of people with high and low achievement motivation can affect how successful those efforts will be (Pekrun et al., 2009).

Differences in achievement motivation also appear in the kinds of goals people go after when they are in achievement-related situations (Corker & Donnellan, 2012; Molden & Dweck, 2000). Some, known as *learning goals*, focus on developing competence (Dweck, 1999; Pintrich, 2003). People pursuing learning goals play golf, take piano lessons, work on puzzles or problems, go to school, and so on, mainly to get better at those activities (Spinath & Steinmayr, 2012). They realize that they may not yet have the skill needed to achieve at a high level, so they learn by watching others and by struggling on their own rather than immediately asking for help (Mayer & Sutton, 1996). They seek help only if they feel they really need it, preferring to ask for explanations, hints, and other forms of task-related information, so as not to lose out on the challenge of the situation (Roussel, Elliot, & Feltman, 2011). In contrast, *performance goals* focus on demonstrating competence to others. People who pursue performance goals tend to seek information about how well they have done compared to others, and not so much about how to improve their performance (Butler, 1998). When they seek help, it is usually to ask for the “right answer” rather than for tips on how to find the answer themselves. Since their primary goal is to display competence, people with performance goals tend to avoid new challenges if they are not confident that they will succeed, and they tend to quit in response to failure (Grant & Dweck, 2003).

Development of Achievement Motivation

Achievement motivation develops in early childhood under the influence of both genetic and environmental factors. As described in the personality chapter, children inherit general behavioral tendencies, such as impulsiveness and emotionality, and these tendencies may support or undermine the development of achievement motivation. The motivation to achieve is also shaped by what children learn from watching and listening to others, especially their parents and teachers (Hughes et al., 2012; Kim, Schaller, & Kim, 2010). Evidence for the influence of parental teachings about achievement comes from a study in which young boys were given a task so difficult that they were sure to fail. Fathers whose sons scored low on achievement motivation tests often became annoyed as they watched their boys work on the task, discouraged them from continuing, and interfered or even completed the task themselves (Rosen & D'Andrade, 1959). A much different response pattern emerged among parents of children who scored high on tests of achievement motivation. Those parents tended to (1) encourage the child to try difficult tasks, especially new ones; (2) give praise and other rewards for success; (3) encourage

Helping Them Do Their Best

Learning-oriented goals are especially appropriate in classrooms, where students typically have little knowledge of the subject matter. This is why most teachers tolerate errors and reward gradual improvement. They do not usually encourage performance goals, which emphasize doing better than others and demonstrating immediate competence (Reeve, 1996). Still, to help students do their best in the long run, teachers may also promote performance goals. The proper combination of both kinds of goals may be more motivating than either kind alone (Barron & Harackiewicz, 2001; Byron & Khazanchi, 2012).

michaeljung/Fotolia

achievement motivation (need for achievement) The degree to which a person establishes specific goals, cares about meeting them, and experiences satisfaction by doing so.



the child to find ways to succeed rather than merely complaining about failure; and (4) prompt the child to go on to the next, more difficult challenge (McClelland, 1985).

The ways in which children learn to think about themselves is another important factor in achievement motivation. Those who are optimistic, confident in their abilities, expect to succeed, and think of achievement situations as challenges rather than threats are more likely to develop high achievement motivation than children who are pessimistic about their abilities, threatened by achievement situations, and expect to fail (Dweck, 1999; Law, Elliot, & Murayama, 2012).

These cognitive habits affect children's behavior in achievement situations, but the habits are themselves affected by the outcome of previous achievement efforts. Strong achievement motivation is more likely to develop in children who have experienced the pride that follows success at facing challenges and meeting standards of excellence. Achievement motivation is likely to be lower in those who have experienced embarrassment or shame following unsuccessful achievement efforts—especially if their failures have been met with ridicule (Stipek, 1983).

Cultural factors can also influence the development of achievement motivation. For example, subtle messages about a culture's view of the importance and value of achievement often appear in the books children read, the stories they hear, and the programs they see on television (Hong & Lin-Siegler, 2011). Does the story's main character work hard and overcome obstacles, thus creating expectations of a payoff for persistence? Or does a lazy main character drift aimlessly and then win the lottery, suggesting that rewards come randomly, regardless of effort? And if the main character succeeds, is it the result of personal effort, as is typical of stories in individualist cultures? Or is success based on ties to a cooperative and supportive group, as is typical of stories in collectivist cultures? These themes appear to act as blueprints for reaching one's goals. It is not surprising, then, that ideas about achievement motivation differ from culture to culture. In one study, individuals from Saudi Arabia and from the United States were asked to comment on short stories describing people succeeding at various tasks. Saudis tended to see the people in the stories as having succeeded because of the help they got from others, whereas Americans tended to attribute success to the internal characteristics of each story's main character (Zahrani & Kaplowitz, 1993).

Children raised in environments that support the development of strong achievement motivation tend not to give up on difficult tasks—even if all the king's horses and all the king's men do!

Al Ross/The New Yorker/www.CartoonBank.com





Goal Setting and Achievement Motivation

Clear and specific goals motivate the most persistent achievement efforts on the job and in other areas, too (Locke & Latham, 2002). These people are more likely to stick with their exercise program if they pursue the goal of "losing twenty pounds" or "doing aerobics three times a week" rather than a vague goal of "getting in shape." Similarly, you are more likely to keep reading this chapter if your goal is to "read the motivation section of the motivation and emotion chapter today" than if it is to "do some studying." Clarifying your goal makes it easier to know when you have reached it and when it is time to take a break. Without clear goals, a person can be more easily distracted by fatigue, boredom, or frustration and more likely to give up too soon.

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Achievement and Success in the Workplace

In the workplace, there is usually more concern with employees' motivation to work hard during business hours than with their general level of achievement motivation. In fact, employers tend to set up jobs consistent with their ideas about how intrinsic and extrinsic motivations combine to shape employees' performance (Riggio, 1989). Employers who see workers as lazy, dishonest, and lacking in ambition tend to offer highly structured, heavily supervised jobs. They give the employees little say in deciding what to do or how to do it. These employers assume that workers are motivated mainly by extrinsic rewards—especially money or job security. So they are often surprised when some employees are dissatisfied with their jobs and show little motivation to work hard, in spite of good pay and benefits (Diener & Seligman, 2004; Igalems & Roussel, 1999).

If good pay and benefits alone don't bring job satisfaction and the desire to excel on the job, what does? In Western cultures, low worker motivation appears to come largely from negative thoughts and feelings about having little or no control over the work environment (Rosen, 1991). Compared with those in highly structured jobs, workers tend to be happier, more satisfied, and more productive if they are (1) encouraged to participate in decisions about how work should be done; (2) given problems to solve, without being told how to solve them; (3) taught more than one skill; (4) given individual responsibility; and (5) given public recognition, not just money, for good performance (Fisher, 2000).

What is the best way to encourage work motivation? Allowing people to set and achieve clear goals is one way to increase both job performance and job satisfaction (Abramis, 1994; Locke & Latham, 2002). Goals that most effectively maintain work motivation have several features (Katzell & Thompson, 1990). First, they are personally meaningful. Thus, if a high-level administrator tells employees that their goal should be to increase production, workers might feel unfairly burdened and not particularly motivated. Second, effective goals tend to be challenging, but not impossible. Moderately difficult goals provide the best opportunity for fairly testing one's skills and for experiencing pride and satisfaction when the goals are met (Trope, 1975, 1983). Third, goals that involve interpersonal competition tend to be effective, especially for workers with high achievement motivation. For example, some automakers have teams of designers compete, not necessarily for money, but for the honor of having "their" new model chosen to be manufactured and sold throughout the world. Similarly, students with high achievement motivation often improve their academic performance by forming study groups whose members compete for the best grades. For such people, knowing that others are vying to achieve the same goal as they are tends to create strong intrinsic motivation, even when there are few if any extrinsic rewards at stake (Harackiewicz & Elliot, 1993; Harackiewicz, Sansone, & Manderlink, 1985). Fourth, effective goals are specific and concrete (Locke & Latham, 2002). Thus, a goal of "doing better" is usually not a strong motivator, whereas a specific target, such as increasing sales by 10 percent, is far more motivating. Finally, goals are most effective if management supports the workers' own goal setting, offers special rewards for reaching goals, and gives encouragement for renewed efforts after failure (Kluger & DeNisi, 1998).

To summarize, motivating jobs offer personal challenges, independence, and both intrinsic and extrinsic rewards. They provide enough satisfaction to feel excitement and pleasure in working hard. They inspire workers to be passionate about work, not merely driven by it (Burke & Fiksenbaum, 2009). For employers, the rewards are more productivity, less absenteeism, and fewer resignations (Ilgen & Pulakos, 1999).

Achievement and Well-Being

Some people believe that the more they achieve and the more money and other material goods they gain as a result, the happier they will be. Do you agree? Researchers studying *positive psychology* (Seligman et al., 2005; Mongrain & Anselmo-Mathews, 2012) have become interested in the systematic study of what it actually takes to achieve happiness, or, more formally, well-being (McNulty & Fincham, 2012). **Well-being** (also known as **subjective well-being**) is a combination of a cognitive judgment of satisfaction with life, the frequent experiencing of positive moods and emotions, and the relatively infrequent experiencing of unpleasant moods and emotions (Diener, 2012).

well-being (subjective well-being)

A cognitive judgment of satisfaction with life, the frequent experiencing of positive moods and emotions, and the relatively infrequent experiencing of unpleasant moods and emotions.

Research on well-being indicates that, as you might expect, people living in extreme poverty or in war-torn or politically chaotic countries are less happy than people in better circumstances (Sacks, Stevenson, & Wolfers, 2013). And people everywhere react to good or bad events with corresponding changes in mood. Making progress toward a goal, for example, can boost well-being (Klug & Maier, 2014). By contrast, as described in the chapter on health, stress, and coping, severe or long-lasting stressors—such as the death of a loved one—can lead to psychological and physical problems. But although events do have an impact, the depressing or elevating effects of major changes, such as being promoted or fired or even being imprisoned, seriously injured, or disabled tend not to last as long or be as intense as we might think they would (Abrantes-Pais et al., 2007; Mathieu & Gosling, 2012). In other words, how happy you are may have less to do with what happens to you than you might expect.

Most event-related changes in mood subside within days or weeks, and most people then return to their previous level of happiness (Suh, Diener, & Fujita, 1996). Even when events create permanent changes in circumstances, most people adapt by changing their expectancies and goals, not by radically and permanently changing their baseline level of happiness (e.g., Smith et al., 2009; Sussman & Shafir, 2011). For example, people may be thrilled after getting a big salary increase, but as they get used to having more money, the thrill fades, and they may eventually feel just as underpaid as before. In fact, although there are exceptions (Fujita & Diener, 2005; Lucas, 2007), most people's level of well-being tends to be remarkably stable over their lives. This stable baseline may be related to temperament or personality and may function like the homeostatic processes that maintain body temperature or weight (Lykken, 1999). Like many other aspects of temperament, our baseline level of happiness may be affected by genetics. Twin studies have shown, for example, that individual differences in happiness are more strongly associated with inherited personality characteristics than with environmental factors such as money, popularity, or physical attractiveness (Lykken, 1999; Tellegen et al., 1988).

Beyond inherited tendencies, the things that appear to matter most in generating happiness are having close social ties (such as friends and a satisfying marriage or partnership) and social support in general, being religious, having relatively high status and respect within a group, fitting in with one's culture, and having the resources necessary to make progress toward one's goals (e.g., Adams, 2012; Anderson et al., 2012; Fischer & Boer, 2011; Oishi, Schimmack, & Diener, 2012). So you don't have to be a smart, rich, physically attractive high achiever to be happy.

These results are consistent with the views expressed over many centuries by philosophers, psychologists, and wise people in all cultures (e.g., Ekman et al., 2005). As discussed in the personality chapter, for example, Abraham Maslow (1970) noted that when people in Western cultures experience unhappiness and psychological problems, those problems may reflect a *deficiency orientation*. This orientation encourages us to seek happiness by trying to acquire the goods and status we don't have—but think we need—rather than by appreciating life itself and the material and nonmaterial riches we already have. The trap inherent in this orientation is that as we struggle to get more money, status, power, or the other things that we think will bring happiness, we may become more unhappy if what we get is never “enough.” Indeed, the old saying that “life is a journey, not a destination” suggests that we are more likely to find happiness by being fully engaged in what we are *doing*—a state that some positive psychologists call *flow* (Hektner, Schmidt, & Csikszentmihalyi, 2007)—rather than by focusing on what we are or are not *getting*.

RELATIONS AND CONFLICTS AMONG MOTIVES

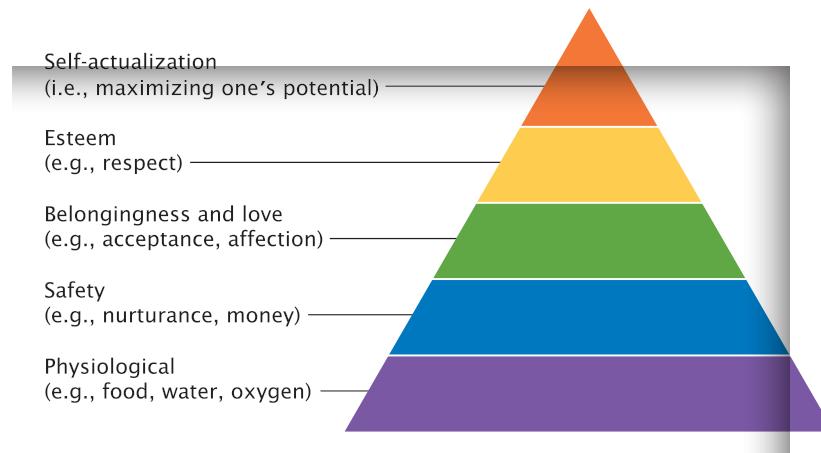
Which motives move me most?

It is far too early to tell whether research on well-being will help channel people's achievement motivation toward a more balanced set of goals, but there is no doubt that people will continue striving to meet whatever needs they perceive to be important. What are those needs?

FIGURE 10.4**Maslow's Hierarchy of Motives**

TRY THIS Abraham Maslow saw human motives as organized in a hierarchy in which motives at lower levels come before those at higher levels. According to this view, self-actualization is the essence of mental health, but Maslow recognized that only rare individuals, such as Mother Teresa or Martin Luther King, Jr., approach full self-actualization. Take a moment to consider which level of Maslow's hierarchy you are focused on at this point in your life. Which level do you ultimately hope to reach?

Source: Adapted from Maslow (1943).

**Maslow's Hierarchy**

Abraham Maslow (1970) was an influential psychologist who argued that human behavior is affected by a hierarchy, or ranking, of five classes of needs, or motives (see Figure 10.4). He reasoned that needs at lower levels of the hierarchy must be at least partially satisfied before people can be motivated by the ones at higher levels. From the bottom to the top of Maslow's hierarchy, these five motives are as follows:

1. **Physiological**, such as the need for food, water, oxygen, and sleep.
2. **Safety**, such as the need to be cared for as a child and to have a secure income as an adult.
3. **Belongingness and love**, such as the need to be part of groups and to participate in affectionate sexual and nonsexual relationships.
4. **Esteem**, such as the need to be respected as a useful, honorable individual.
5. **Self-actualization**, which means reaching one's full potential. People motivated by this need explore and enhance relationships with others; follow interests for intrinsic pleasure rather than for money, status, or esteem; and are concerned with issues affecting all people, not just themselves.

Maslow's hierarchy has been very influential over the years, partly because the needs associated with basic survival and security do generally take precedence over those related to self-enhancement or personal growth (Baumeister & Leary, 1995; Oishi et al., 1999). But critics see the hierarchy as too simplistic (Hall, Lindzey, & Campbell, 1998; Kenrick et al., 2010; Neher, 1991). It doesn't predict or explain, for example, the motivation of people who starve themselves to draw attention to political or moral causes. Further, people may not have to satisfy one kind of need before addressing others; we can seek to satisfy several needs at once. Finally, the ordering of needs within the survival/security and enhancement/growth categories differs from culture to culture, suggesting that there may not be a single, universal hierarchy of needs.

To address some of the problems in Maslow's theory, Clayton Alderfer (1969) proposed *existence, relatedness, growth (ERG) theory*, which places human needs into just three categories: *existence needs* (such as for food and water), *relatedness needs* (e.g., for social interactions and attachments), and *growth needs* (such as for developing one's capabilities). Unlike Maslow, Alderfer doesn't propose that needs must be satisfied in a particular order. Instead, he sees needs in each category as rising and falling from time to time and situation to situation. When a need in one area is fulfilled (or even if it is frustrated), a person will be motivated to pursue some other needs. For example, if a breakup frustrates relatedness needs, a person might focus on existence or growth needs by eating more or volunteering to work late.

CONFLICTING MOTIVES AND STRESS

As in the case of hunger strikes, in which the desire to promote a cause is pitted against the desire to eat, human motives sometimes conflict. The usual result is some degree of discomfort. For example, imagine that you are alone and bored on a Saturday night and you think about going out for a snack. What are your motives? Hunger might play a part, and so might the prospect of the increased physiological arousal that a change of scene will provide. Even sexual motivation might be involved, as you consider the chances of meeting someone exciting in the convenience store. But safety-related motives may also kick in: Is your neighborhood safe enough to go out alone? An esteem motive might come into play, too, making you hesitate to be seen on your own on a weekend night (Krieglmeyer et al., 2010).

These are just a few of the motives that may shape even a trivial decision. When the decision is more important, the number and strength of motivational pushes and pulls are often greater, creating far more internal conflict and indecision. There are four basic types of motivational conflicts (Elliot, 2008; Miller, 1959):

- 1. Approach-approach conflicts.** When we must choose only one of two desirable activities—say, going to a movie or to a concert—an *approach-approach conflict* exists.
- 2. Avoidance-avoidance conflicts.** An *avoidance-avoidance conflict* arises when we must select one of two undesirable alternatives. Someone forced either to sell the family home or to declare bankruptcy faces an avoidance-avoidance conflict.
- 3. Approach-avoidance conflicts.** If someone you dislike had tickets to your favorite group's sold-out concert and invited you to come along, what would you do? When a particular event or activity has both attractive and unattractive features, an *approach-avoidance conflict* is created.
- 4. Multiple approach-avoidance conflicts.** Suppose you must choose between two jobs. One offers a high salary in a well-known company but requires long work hours and moving to a miserable climate. The other boasts advancement opportunities, fringe benefits, and a better climate, but doesn't pay as much and requires an unpredictable work schedule. This is an example of a *multiple approach-avoidance conflict*, in which two

A Stressful Conflict

TRY THIS Think back to when you were deciding which college to attend. Was the decision easy and obvious or did it create a motivational conflict? If there was a conflict, was it an approach-approach, approach-avoidance, or multiple approach-avoidance conflict? What factors were most important in deciding how to resolve the conflict, and what emotions and signs of stress did you experience during and after the decision-making process?

PhotosIndia.com LLC/Alamy



(continued)

or more alternatives each have both positive and negative features. Such conflicts are the most difficult to resolve, partly because the features of each option may not be easy to compare. For example, how many dollars a year does it take to compensate you for living in a bad climate?

The difficulties associated with resolving each of these conflicts can create stress, a topic explored in the chapter on health, stress, and coping (Krosch, Figner, & Weber, 2012). During motivational conflicts, people are often tense, irritable, and more vulnerable than usual to physical and psychological problems. These reactions are especially likely when no choice is obviously "right," when varying motives have approximately equal strength, and when a choice can have serious consequences (as in decisions about marrying, splitting up, or placing an elderly parent in a nursing home). Some people may spend a long time agonizing over these conflicts, whereas others may make a choice quickly, impulsively, and thoughtlessly, simply to end the discomfort of uncertainty. Even after resolving the conflict on the basis of careful thought, people may continue to experience stress responses, such as worrying about whether they made the right decision or blaming themselves for bad choices. These and other consequences of conflicting motives sometimes lead to depression or other serious disorders.

The emotions associated with motivational conflicts provide just one example of the close links between motivation and emotions. Motivation can intensify emotions, as when hunger leads a normally calm person to angrily complain about slow service at a restaurant. But emotions can also create motivation. Happiness, for example, is an emotion that people want to feel (e.g., Bryant & Veroff, 2006), so they engage in whatever behaviors—studying, artwork, investing, beachcombing—they think will achieve it. Similarly, as an emotion that most people want to avoid, anxiety motivates many behaviors, from leaving the scene of an accident to staying away from poisonous snakes. But sometimes, as when facing a stressful job interview or agreeing to a painful medical procedure, people are motivated to endure anxiety or other unpleasant emotions because they believe that doing so will eventually lead to a desired goal (Tamir, 2009). Let's take a closer look at emotions.

THE NATURE OF EMOTIONS

How do feelings differ from thoughts?

Everyone seems to agree that joy, sorrow, anger, fear, love, and hate are emotions. However, it is often hard to identify the shared features that make these experiences emotions rather than, say, thoughts or impulses.

Defining Characteristics and Dimensions

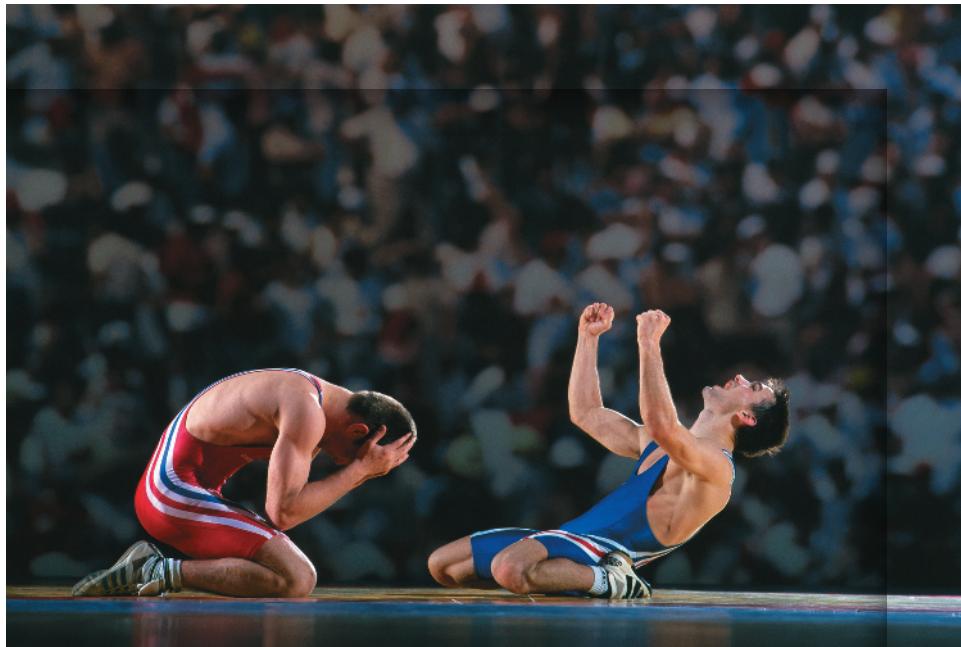
Most psychologists in Western cultures tend to see emotions as organized psychological and physiological reactions to significant life events (Izard, 1993). These reactions are partly private, or *subjective*, experiences and partly measurable patterns of behavior and physiological arousal. The subjective experience of emotions has several characteristics:

1. Emotions are usually *temporary*. In other words, they tend to have relatively clear beginnings and ends and a relatively short duration. Moods, by contrast, tend to last longer.
2. Emotions can feel *positive*, as in joy, or *negative*, as in sadness. They can also be a mixture of both, as in the bittersweet feelings of watching one's child leave for the first day of kindergarten (Larsen et al., 2004).
3. Emotions vary in intensity. You can feel pleased, happy, or ecstatic. You can also feel mildly disappointed, sad, or deeply depressed (Shidlovski & Hassin, 2011).

Winners and Losers

Emotional experiences depend in part on our interpretation of situations and how those situations relate to our goals. A single event—the announcement of the results of this wrestling match—triggered drastically different emotional reactions in the contestants, depending on whether they perceived it as making them the winner or the loser.

Dimitri lundt/TempSport/Corbis Sports/Corbis



4. Emotion is triggered partly by thoughts, especially by a *mental assessment* of how a situation relates to your goals. The same event can bring on different emotions depending on what it means to you. An exam score of 75 percent may thrill you if your best previous score had been 50 percent, but it may upset you if you had never before scored below 90 percent.
5. Emotion *alters thought processes*, often by directing attention toward some things and away from others. Negative emotions tend to narrow attention, and positive emotions tend to broaden it (Ford et al., 2010; Fredrickson et al., 2008). Anxiety about terrorism, for example, narrows our attention to focus on potential threats in airports and other public places (e.g., Nobata, Hakoda, & Ninose, 2010).
6. Emotion brings on an *action tendency*, a motivation to behave in certain ways. Grieving parents' anger, for example, might motivate them to try to harm their child's killer. But for other parents, grief might lead them to form an organization dedicated to preventing similar crimes and bringing more criminals to justice.
7. Emotional experiences are *passions* that you feel, whether you want to or not. You have some control over emotions, though, because they depend partly on how you view situations (Gross, 2001). For example, you can reduce your emotional reaction to a car accident by reminding yourself that no one was hurt and that you are insured. Still, you can't just *decide* to have an emotion; instead, you "fall in love" or "explode in anger" or are "overcome by grief."

In other words, the subjective aspects of emotions are experiences that are both triggered by the thinking self and felt as happening to the self. The extent to which we are "victims" of our passions versus rational controllers of our emotions is a central dilemma of human existence.

The objectively measurable aspects of emotions include learned and innate *expressive displays* and *physiological responses*. Expressive displays—such as a smile or a frown—communicate feelings to others. Physiological responses—changes in heart rate, for example—provide the biological adjustments needed to perform actions generated by the emotional experience. If you throw a temper tantrum, for instance, your heart must deliver additional oxygen and fuel to your muscles.

In summary, **emotions** are temporary experiences with positive, negative, or mixed qualities (Larsen & Green, 2013). People experience emotions with varying intensity as

emotions Temporary positive or negative experiences that are felt as happening to the self, that are generated partly by interpretation of situations, and that are accompanied by learned and innate physical responses.

happening to the self, generated in part by a mental assessment of situations, and accompanied by both learned and innate physical responses. Through emotions, whether they mean to or not, people communicate their internal states and intentions to others. Emotions often disrupt thinking and behavior, but they also trigger and guide thinking and organize, motivate, and sustain behavior and social relations (Izard, 2007).

Where do our emotions come from? There are two main sources: our biology and our thoughts. Let's consider what psychologists have discovered about how these sources operate, separately and together, to create emotional experiences.

The Biology of Emotions

The biological systems described in the chapter on biological aspects of psychology play a major role in emotions. In the *central nervous system*, numerous brain areas are involved in generating emotions as well as in our experience of those emotions (Wilson-Mendenhall, Barrett, & Barsalou, 2013). The *autonomic nervous system* gives rise to many of the physiological changes associated with emotional arousal.

Brain Mechanisms

Three main principles describe how brain processes contribute to emotions. First, activity in the *limbic system*, especially in the *amygdala*, is central to emotions (Kensinger & Corkin, 2004; Phelps & LeDoux, 2005). Normal functioning in the amygdala appears critical to the ability to learn emotional associations, recognize emotional expressions, detect personally relevant information, and perceive emotionally charged words (e.g., Cunningham & Brosch, 2012). For example, victims of a disease that destroys only the amygdala are unable to judge other people's emotional states by looking at their faces (Adolphs, Tranel, & Damasio, 1998).

TRY THIS

A second aspect of the brain's involvement in emotions is seen in its control over our emotional and nonemotional facial expressions (Rinn, 1984; Szameitat et al., 2010). Take a moment to look in a mirror, and put on your best fake smile. The voluntary facial movements you just made, like all voluntary movements, are controlled by the brain's *pyramidal motor system*, a system that includes the motor cortex. However, a smile that expresses genuine happiness is involuntary. That kind of smile, like the other facial movements associated with emotions, is governed by the *extrapyramidal motor system*, which depends on areas beneath the cortex. Brain damage can disrupt either system. People with pyramidal motor system damage show normal facial expressions during genuine emotion, but they cannot fake a smile. In contrast, people with damage to the extrapyramidal system can pose facial expressions at will, but they may remain straight-faced even when feeling genuine joy or profound sadness (Hopf, Muller, & Hopf, 1992).

A third aspect of the brain's role in emotions is revealed by research on the two sides, or hemispheres, of the cerebral cortex. For example, after suffering damage to the right, but not the left, hemisphere, people no longer laugh at jokes, even though they can still understand their words, the logic (or illogic) underlying them, and their punch lines (Critchley, 1991). Further, when people are asked to name the emotions shown in slides of facial expressions, blood flow increases in the right hemisphere more than in the left hemisphere (Gur, Skolnick, & Gur, 1994). But smiling while experiencing a positive emotion is correlated with greater activity in the *left* side of the brain (Davidson et al., 1990). When an area of one patient's left hemisphere was stimulated, she began to smile, then laugh (Fried et al., 1998). She attributed her emotional expression to the situation ("You guys are just so funny ... standing around"). Similarly, brain-imaging studies conducted while sports fans watched their favorite team in action have revealed greater activation in the left hemisphere when the team is winning and more activation in the right hemisphere when the team is losing (Park et al., 2009). And there's evidence that the experience of anger or depression is associated with greater brain activity on the right side than on the left (Carver & Harmon-Jones, 2009; Herrington et al., 2010).

The fact that different brain areas appear to be involved in displaying and experiencing positive and negative emotions (e.g., Harmon-Jones, 2004) makes it difficult to map the exact roles the two hemispheres play in emotion. Generally, however, most aspects of emotions—the experiencing of negative emotion, the perception of any emotion exhibited in faces or other stimuli, and the facial expression of any emotion—depend more on the right hemisphere than on the left (Heller, Nitschke, & Miller, 1998; Kawasaki et al., 2001).

If the right hemisphere is relatively dominant in emotions, which side of the face would you expect to be somewhat more involved in expressing emotions? If you said the left side, you are correct, because, as described in the chapter on biological aspects of psychology, movements of each side of the body are controlled by the opposite side of the brain.

FIGURE 10.5
The Autonomic Nervous System

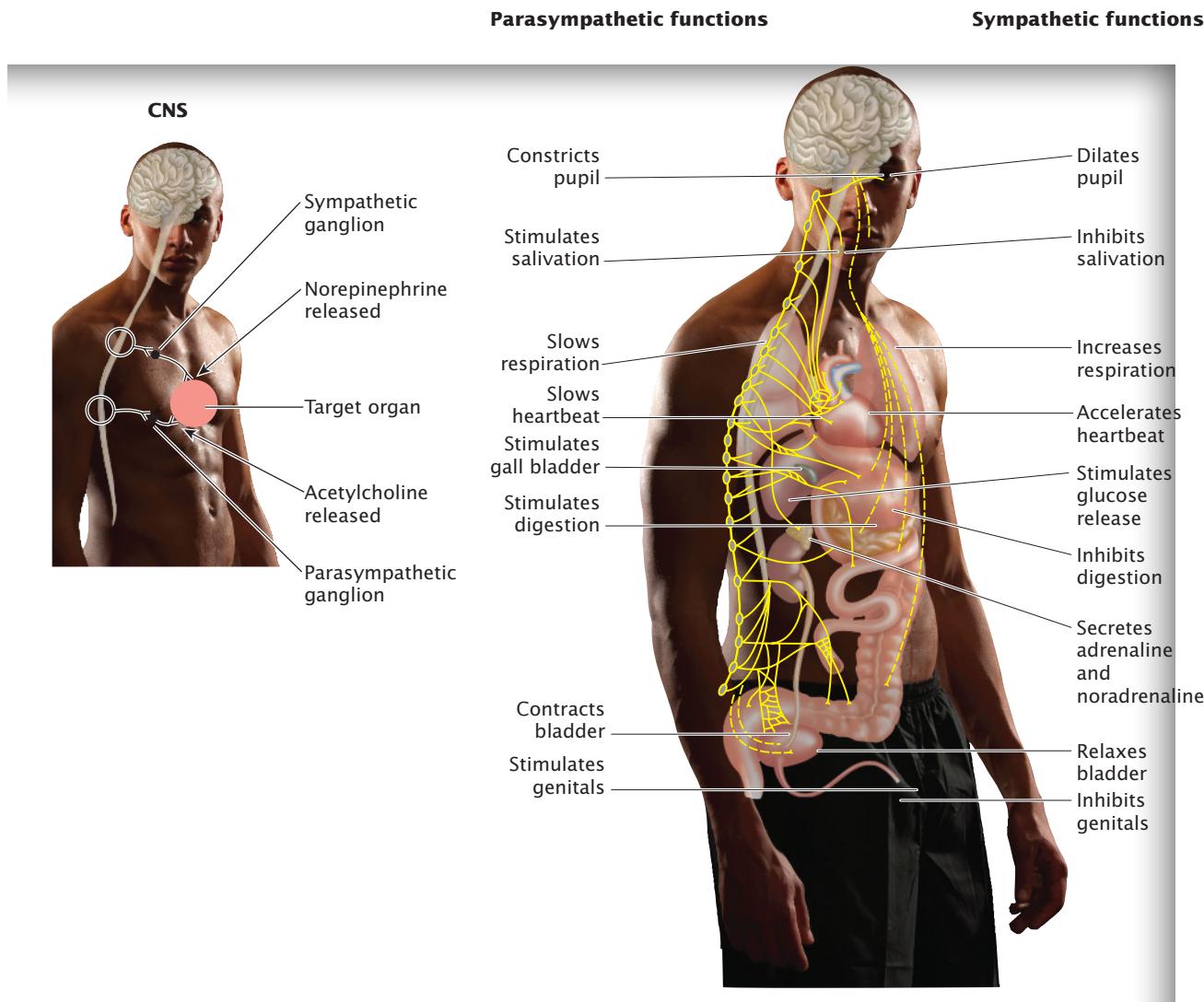
TRY THIS Emotional responses involve activation of the autonomic nervous system, which is organized into sympathetic and parasympathetic subsystems. Which of the bodily responses shown here do you associate with emotional experiences?

Peter Kindersley/Stockbyte/Getty Images

Mechanisms of the Autonomic Nervous System

The autonomic nervous system (ANS) triggers many of the physiological changes that go with emotions (Vernet, Robin, & Dittmar, 1995; see Figure 10.5). If your hands get cold and clammy when you are nervous, it is because the ANS has increased perspiration and decreased the blood flow in your hands.

As described in the chapter on biological aspects of psychology, the ANS carries information between the brain and most body organs—the heart and blood vessels, the digestive system, and so on. Each of these organs is active on its own, but input from the



ANS can increase or decrease that activity. By doing so, the ANS coordinates the functioning of these organs to meet the body's general needs and prepare the body for change (Porges, Doussard, & Maita, 1995). If you are aroused to take action, such as running to catch a bus, you need more glucose to fuel your muscles. The ANS frees needed energy by stimulating the secretion of glucose-generating hormones and promoting blood flow to the muscles.

Figure 10.5 shows that the autonomic nervous system is organized into two parts: the sympathetic nervous system and the parasympathetic nervous system. Emotions can activate either part, both of which send axon fibers to each organ in the body. Generally, the sympathetic and parasympathetic fibers have opposite effects on these *target organs*. Axons from the **parasympathetic nervous system** release the neurotransmitter *acetylcholine* onto target organs, leading to activity related to the protection, nourishment, and growth of the body. Axons from the **sympathetic nervous system** release a different neurotransmitter, *norepinephrine*, onto target organs, helping prepare the body for vigorous activity. When one part of the sympathetic system is stimulated, other parts are activated "in sympathy" with it (Gellhorn & Loofbourrow, 1963). The result is the **fight-flight reaction** (also called the **fight-or-flight syndrome**), a pattern of increased heart rate and blood pressure, rapid or irregular breathing, dilated pupils, perspiration, dry mouth, increased blood sugar, "goose bumps," and other changes that help prepare the body to confront or run from a threat.

You cannot consciously experience the brain mechanisms that alter the activity of your autonomic nervous system. This is why most people cannot exert direct, conscious control over blood pressure or other aspects of ANS activity. However, you can do things that have indirect effects on the ANS. For example, to create autonomic arousal of your sex organs, you might imagine an erotic situation. To raise your blood pressure, you might hold your breath or strain your muscles. And to lower your blood pressure, you can lie down, relax, and think calming thoughts.

THEORIES OF EMOTION

Are emotions in the heart, in the head, or both?

Are the physiological responses associated with emotions enough to create an emotional experience? Or are those responses the *result* of emotional experiences that begin in the brain? And how do our mental interpretations of events affect our emotional reactions to them? For over a century now, psychologists have worked to answer these questions. In the process, they developed a number of theories that explain emotions mainly in terms of biological or cognitive factors. The main biological theories are those of William James and Walter Cannon. The most prominent cognitive theories are those of Stanley Schachter and Richard Lazarus. Let's review these theories, along with some research designed to evaluate them.

James's Peripheral Theory

Suppose you are camping in the woods when a huge bear wanders into camp. You might be afraid and run for your life, but would you run because you're afraid or are you afraid because you run? This was the example and question posed by William James, one of the first psychologists to offer a formal account of how physiological responses relate to emotional experience. He argued that you are afraid because you run. Your running and the physiological responses associated with it, he said, follow directly from your perception of the bear.

At first, James's claim sounds ridiculous; it would be silly to run from something unless you already feared it. James concluded otherwise after examining his own mental processes. He felt that once you strip away all physiological responses—such as changes in heart rate, breathing, and other peripheral nervous system activity—nothing remains of

parasympathetic nervous system
The subsystem of the autonomic nervous system that typically influences activity related to the protection, nourishment, and growth of the body.

sympathetic nervous system The subsystem of the autonomic nervous system that readies the body for vigorous activity.

fight-flight reaction (fight-or-flight syndrome) Physical reactions triggered by the sympathetic nervous system that prepare the body to fight or flee a threatening situation.

an emotion's experience (James, 1890). Without these responses, he said, you would feel no fear, because it is the experiencing of physiological responses that creates fear and other emotions. The same argument was made by Carle Lange, a Danish physician, so James's view is sometimes called the *James-Lange theory* of emotion. It is also known as a *peripheral theory* of emotion, because it emphasizes activity in the peripheral nervous system, not in the central nervous system, as the main cause of emotional experience.

Observing Peripheral Responses

According to James, the first step in the creation of an emotional experience occurs when perception affects the cerebral cortex. The brain interprets a situation and automatically directs a unique set of physiological changes, such as increased heart rate, sinking stomach, perspiration, and certain patterns of blood flow. It is the act of being *aware* of this pattern of bodily changes, said James, that constitutes the experience of an emotion. According to this view, each particular emotion is created by a particular pattern of physiological responses.

Notice that according to James's theory, emotional experience is not generated by the brain alone. There is no special "emotion center" in the brain where neuron activity directly creates an experience of emotion. If this theory is accurate, it might account for the difficulty we sometimes have in knowing our true feelings: we must figure out what emotions we feel by perceiving small differences in specific physiological response patterns (Katkin, Wiens, & Öhman, 2001).

Evaluating James's Theory

Indeed, certain emotional states are associated with particular patterns of autonomic changes (e.g., Damasio et al., 2000; Dunn et al., 2010; Harrison et al., 2010). For example, blood flow to the hands and feet increases in anger and decreases with fear (Levenson, Ekman, & Friesen, 1990). Thus fear truly does involve "cold feet"; anger does not. When we feel disgust, there is increased muscle activity but no change in heart rate. Differing patterns of autonomic activity occur even when people just mentally relive emotional experiences (Ekman, Levenson, & Friesen, 1983). These emotion-specific patterns of physiological activity occur in widely different cultures (Levenson et al., 1992). Further, people who are more keenly aware of physiological changes in their bodies are likely to experience emotions more intensely than those who are less aware of such changes (Schneider, Ring, & Katkin, 1998; Wiens, Mezzacappa, & Katkin, 2000).

It may even be that the "gut feelings" that cause us to approach or avoid certain situations might come from physiological changes that we perceive without conscious awareness (Katkin, Wiens, & Öhman, 2001; Winkielman & Berridge, 2004).

Different patterns of autonomic activity are also related to specific emotional facial expressions. In one study, research participants were told to make a series of facial movements that, when combined, would create the appearance of sadness, fear, happiness, anger, or some other emotion (Levenson, Ekman, & Friesen, 1990). Making these movements led to autonomic changes that resembled those normally accompanying emotions. Also, almost all participants reported feeling the emotion associated with the expression they created, even though they couldn't see their own expressions and didn't realize that they had made an "emotional" face.

Other studies have confirmed these results (Schnall & Laird, 2003) and have also shown that emotional feelings can be eased by relaxing facial muscles (Duclos & Laird, 2001). Even our ability to understand emotional information seems to be due in part to the facial movements we make in response to that information. For example, when people's faces are immobilized by injections of botulinum toxin-A (Botox) they find it more difficult to understand the meaning of emotional reading material (Havas et al., 2010).

A variation on James's theory, called the *facial feedback hypothesis*, suggests that facial movements provide enough information to cause an emotional feeling (Ekman & Davidson, 1993). If so, it might explain why posed facial expressions create the emotions



Do You Feel It, Too?

TRY THIS To get an idea of how facial expressions can alter as well as communicate emotion, try your best to imitate the expression shown in this photograph. Did this create in you the same feelings and autonomic responses that the other person appears to be experiencing?

Pixland/Thinkstock

TRY THIS

normally associated with them. Try taking advantage of this notion yourself. The next time you want to cheer yourself up, it might help to smile—even though you don't feel like it (Fleeson, Malanos, & Achille, 2002)! And be aware that even unintentional facial expressions may trigger an emotion. For example, the involuntary frown caused by the brightness of the sun has been shown to make people feel more aggressive (Marzoli et al., 2013).

Lie Detection

The idea that different patterns of physiological activity are associated with different emotions forms the basis for most lie detection techniques. If people experience anxiety or guilt when they lie, specific patterns of autonomic physiological activity accompanying these emotions should be detectable on instruments, called *polygraphs*, that record heart rate, breathing rate, and perspiration (Granhag & Stromwall, 2004; Iacono & Patrick, 2006).

To identify the perpetrator of a crime using the *control question test*, a polygraph tester might ask questions specific to the crime, such as "Did you stab someone on May 31, 2014?" Responses to such *relevant questions* are then compared with responses to *control questions*, such as "Have you ever lied to get out of trouble?" Innocent people might have lied at some time in the past and might feel guilty when asked about it, but they should have no reason to feel guilty about what they did on May 31, 2014. Accordingly, an innocent person should have a stronger emotional response to control questions than to relevant questions (Rosenfeld, 1995). Another approach, called the *directed lie test*, compares a person's physiological reactions when asked to lie about something and when telling what is known to be the truth. Finally, the *guilty knowledge test* seeks to determine whether a person reacts in a notable way to information about a crime that only the guilty party would know (Ben-Shakhar, Bar-Hillel, & Kremnitzer, 2002).

Most people have emotional responses when they lie, but the accuracy of polygraphs is not perfect. Some studies suggest that polygraphs detect 90 percent of lying individuals (e.g., Gamer et al., 2006; Honts & Quick, 1995), while others find that polygraphs mislabel up to 40 percent of truthful people as guilty liars (Ben-Shakhar & Furedy, 1990; Saxe & Ben-Shakhar, 1999).

The inconsistency occurs partly because polygraph results are not just based on whether a person is truthful. What people think about the act of lying and about the value of the test can also matter. For example, people who believe that lying is ok and who don't trust polygraphs are not likely to have emotion-linked physiological responses while lying during the test. However, an innocent person who believes in such tests and who thinks that "everything always goes wrong" might show a large fear response when asked about a crime, thus wrongly indicating "guilt" (Lykken, 1998b).

So although polygraphs do catch some liars, most agree that a guilty person can "fool" a polygraph lie detector and that some innocent people can be mislabeled as guilty (Ruscio, 2005). After reviewing the relevant research literature, a panel of distinguished psychologists and other scientists in the United States expressed serious reservations about the value of

polygraph tests in detecting deception and argued against their use as evidence in court or in employee screening and selection (Committee to Review the Scientific Evidence on the Polygraph, 2003). Scientists are working on several alternative lie-detecting techniques, including those that focus on brain activity, impose high cognitive demands during interrogation interviews, spring surprising questions, or ask people to draw pictures about their experiences. Such alternative measures do not depend on a link between deception and autonomic nervous system responses (Farah et al., 2014; Langelben & Moriarty, 2013; ten Brink, Stimson, & Carney, 2014).

Cannon's Central Theory

James said that the experience of emotions depends on feedback from physiological responses occurring outside the brain, but Walter Cannon disagreed (Cannon, 1927).



Searching for the Truth

Polygraph tests have limited accuracy, and so do the alternative lie detection methods designed to improve on them (Ganis et al., 2011; Porter & Brinke, 2010). However, they may intimidate people who believe that they are foolproof. In one small town police station, which had no polygraph, a burglar confessed to his crime when a kitchen colander was placed on his head and attached by wires to a copy machine (Shepherd, Kohut, & Sweet, 1989).

Guy Bell/Alamy

According to Cannon, you feel fear at the sight of a wild bear even before you start to run because, he argued, emotional experience starts in the brain.

According to Cannon's *central theory* of emotions (called the *Cannon-Bard theory*, in recognition of Philip Bard's contribution), information about emotional situations goes first to the thalamus. The thalamus then sends signals to the autonomic nervous system and—at the same time—to the cerebral cortex, where emotion becomes conscious. So when you see a bear, the brain receives sensory information about it, interprets that information as a bear, and then creates the experience of fear while at the same time sending messages to your heart, lungs, and legs to get you out of the situation. According to Cannon's theory, then, there is a *direct* experience of emotion in the central nervous system, whether or not the brain receives feedback about responses in other parts of the body.

Updating Cannon's Theory

Research after Cannon's time showed that the thalamus is not the "seat" of emotion, as he had suggested. Still, the thalamus does participate in emotional processing (Lang, 1995). For example, studies of humans and laboratory animals show that the emotion of fear can be generated by connections from the thalamus to the amygdala (Anderson & Phelps, 2000; LeDoux, 1995). The implication is that strong emotions can bypass the cortex without requiring conscious thought to activate them. This process may explain why it is so difficult to overcome an intense fear, or phobia, even if we consciously know the fear is irrational.

An updated version of Cannon's theory suggests that activity in certain brain areas is experienced as either enjoyable or aversive, and produces the pleasure or discomfort of emotion. In humans, these areas connect extensively throughout the brain (Fossati et al., 2003). As a result, representation of emotions in the brain probably involves widely distributed neural circuits, not a narrowly localized emotion "center" (Derryberry & Tucker, 1992; West et al., 2010).

Cognitive Theories of Emotion

Suppose you are about to be interviewed for your first job or go out on a blind date or take your first ride in a hot-air balloon. In such situations, it is not always easy to be sure of what you are feeling. Is it fear, excitement, anticipation, worry, happiness, dread, or what? Stanley Schachter suggested that the emotions we experience are shaped partly by how we interpret the arousal we feel. His cognitive theory of emotions is known as the *Schachter-Singer theory* in recognition of the contributions of Jerome Singer. The theory took shape in the early 1960s, when many psychologists were questioning the validity of James's theory of emotion. Schachter argued that the theory was essentially correct but needed a few modifications (Cornelius, 1996).

According to the Schachter-Singer theory, emotions result from a combination of feedback from the body's responses and our interpretation of what caused those responses. So cognitive interpretation comes into play twice: first, when you perceive the situation that leads to bodily responses and second, when you interpret those responses as a particular emotion. Schachter said that a given pattern of physiological responses can be interpreted in many different ways and so might yield many different emotions. According to Schachter, then, the emotion you experience when that bear approaches your campsite might be fear, excitement, astonishment, or surprise, depending on how you label your bodily reactions (Schachter & Singer, 1962).

Schachter also argued that how we label arousal depends on **attribution**, or what we think caused an event. We attribute our physiological arousal to different emotions depending on the information we have about the situation. For example, if you watch the final seconds of a close ball game, you might attribute your racing heart, rapid breathing, and perspiration to excitement. But you might attribute the same physiological reactions to anxiety if you are waiting for a big exam to begin. Schachter predicted that our emotional

attribution The process of explaining the cause of some event.



Labeling Arousal

Schachter's cognitive theory of emotion predicts that these people will attribute their physiological arousal to the game they are watching and will label their emotion as "excitement." Further, as described in the chapter on health, stress, and coping, the emotions they experience will also depend partly on their cognitive interpretation of the outcome (Lazarus & Folkman, 1984). Those who see their team's defeat as a disaster will experience more negative emotions than those who think of it as a challenge to improve.

ZUMA Press/ZUMAPRESS/Newscom

experiences will be less intense if we attribute arousal to a nonemotional cause. So if you notice your heart pounding before an exam but say to yourself, "Sure my heart's pounding—I just drank five cups of coffee!" then you should feel "wired" from caffeine but not afraid or worried. This prediction has received some support (Mezzacappa, Katkin, & Palmer, 1999; Sinclair et al., 1994), but other aspects of Schachter's theory have not.

Few researchers today fully accept the Schachter-Singer theory, but it did stimulate an enormous amount of research, including research on **excitation transfer theory**. This theory focuses on a phenomenon in which physiological arousal from one experience carries over to affect emotions in a new situation (Eskine, Kacinik, & Prinz, 2012; Reisenzein, 1983; Zillmann, 1984). For example, people who have been aroused by physical exercise become angrier when provoked and experience more intense sexual feelings around an attractive person than do people who have been

less physically active (Allen et al., 1989). Physiological arousal from fear, like arousal from exercise, can also enhance emotions, including sexual feelings. One study of this transfer took place in Canada, near a deep river gorge. The gorge could be crossed either by a shaky, swinging bridge or by a more stable wooden structure. A female researcher asked men who had just crossed each bridge to respond to a questionnaire that included pictures from the TAT, the projective test described in Figure 10.3. The amount of sexual content in the stories these men wrote about the pictures was much higher among those who met the woman after crossing the more dangerous bridge compared to those who had crossed the stable bridge. Furthermore, they were more likely to rate the researcher as attractive and to attempt to contact her afterward (Dutton & Aron, 1974). When the person giving out the questionnaire was a male, however, the type of bridge crossed had no impact on sexual imagery. You might be wondering whether the men who crossed the dangerous bridge were simply more adventurous than other men regarding both bridge crossing and heterosexual encounters. To check this possibility, the researchers repeated the study, but with one change. This time, the woman approached the men farther down the trail, long after physiological arousal from the bridge crossing had subsided. Now the apparently adventurous men were no more likely than others to rate the woman as attractive. So it was probably excitation transfer, not differing amounts of adventurousness, that produced the original result.

Schachter focused on the way we interpret our bodily responses to events. Other cognitive theorists have argued that it is our interpretations of the events themselves that are most important in shaping emotional experiences. For example, as we mentioned earlier, a person's emotional reaction to receiving exam results can depend partly on whether the score is seen as a sign of improvement or as a disaster. According to Richard Lazarus's (1966, 1991) *cognitive appraisal theory* of emotion, these differing reactions can be best explained by how we think exam scores, job interviews, blind dates, bear sightings, and other events will affect our personal well-being. According to Lazarus, the process of cognitive appraisal, or evaluation, begins when we decide whether an event matters to us; that is, do we even care about it? If we don't, as might be the case when an exam doesn't count toward our grade, we are unlikely to have an emotional experience when we get the results. If the event is relevant to our health, well-being, status, self-esteem, goals, or finances (or those of a loved one) we will probably have a significant emotional reaction to it. That reaction will be positive or negative, said Lazarus, depending on whether we interpret the event as advancing our personal goals or as threatening to harm us or block our progress. The *specific* emotion we experience depends on our individual goals, needs, personal and cultural standards, expectations, and experiences. As a result, a second-place finisher in a marathon race might experience bitter disappointment at having "lost," whereas someone at the back of the pack may be thrilled just to have completed the race.

excitation transfer theory The theory that physiological arousal stemming from one situation is carried over to and enhances emotional experience in an independent situation.

More recently, researchers have developed cognitive theories of emotion that depart from Schachter's in some new directions. In the *conceptual act model* of emotion, for instance, *core affect*—pleasant or unpleasant feelings—is distinguished from *emotion*. According to this model, emotion results when we impose on a feeling a *category label* (e.g., guilt, shame, anger, or resentment) that our cultural and language training has taught us to use (Barrett & Kensinger, 2010; Barrett, Mesquita, & Gendron, 2011). For instance, if you succeed at an important task and attribute the success to your own efforts, then you'll likely feel pride. But, if you attribute that same success to the help of another person, then you'll more likely feel gratitude. Similarly, if you fail at an important task and attribute your failure to your own mistakes or lack of effort, then you'll probably feel guilt or shame. If you attribute that same failure to the interference of another person, then you are more likely to feel anger. Models like this one are valuable because they incorporate research on language and culture in an effort to better understand the labeling processes involved in human emotional experience.

“In Review: Theories of Emotion” summarizes key elements of the theories we have discussed. Research on these theories suggests that both bodily responses (including facial responses) and the cognitive interpretation of those responses add to emotional experience. So does cognitive appraisal of events themselves. In addition, the brain can apparently generate emotional experience independent of physiological arousal. So emotions are probably both in the heart and in the head (including the face). Some basic emotions—fear and anger, for example—probably occur directly within the brain, whereas the many more complex shades of emotions—such as hope, pride, shame, guilt, and disappointment—probably arise from attributions, categorization, and other cognitive interpretations of physiological responses (Barrett et al., 2013; Dębiec & LeDoux, 2009).

THEORIES OF EMOTIONS

IN REVIEW

Theory	Source of Emotions	Example
James-Lange	Emotions are created by awareness of specific patterns of peripheral (autonomic) responses.	Anger is associated with increased blood flow in the hands and feet; fear is associated with decreased blood flow in these areas.
Cannon-Bard	The brain generates direct experiences of emotions.	Stimulation of certain brain areas can create pleasant or unpleasant emotions.
Cognitive (Schachter-Singer, Lazarus)	Cognitive interpretation of events and of physiological reactions to events shapes emotional experiences.	Autonomic arousal can be experienced as anxiety or excitement, depending on how it is labeled. A single event can lead to different emotions, depending on whether it is perceived as threatening or challenging.

In Review Questions

1. Research showing that there are pleasure centers in the brain has been cited in support of the _____ theory of emotions.
2. The use of polygraphs in lie detection is based on the _____ theory of emotions.
3. The process of attribution is most important to _____ theories of emotions.

COMMUNICATING EMOTION

Which emotional expressions are innate and which are learned?

So far, we have described emotions and how people experience them. Let's now consider how people communicate emotions to one another.

One way they do this is, of course, through words. Some people describe their feelings relatively simply, and mainly in terms of pleasantness or unpleasantness; others include information about the intensity of their emotions (Barrett et al., 2001, 2007). In general, women are more likely than men to talk about their emotions and the complexity of their feelings (Barrett et al., 2000). Humans also communicate emotion through touch (Thompson & Hampton, 2011), body movement and posture (de Gelder et al., 2004; Hadjikhani & de Gelder, 2003), tone of voice (Simon-Thomas et al., 2009), and especially through facial movements and expressions.

Imagine a woman watching television. You can see her face but not what she sees on the screen. She might be deep in complex thought, perhaps comparing her investment decisions with those of the experts being interviewed on CNBC. Or she might be thinking of nothing at all as she loses herself in a rerun of *CSI*. In other words, you can't tell much about what she is thinking just by looking at her. But if the TV program creates an emotional experience, you will be able to make a reasonably accurate guess about which emotion she is feeling based on her facial expressions. The human face can create thousands of different expressions, and

people—especially females—are good at detecting them (McClure, 2000; Rennels & Cummings, 2013; Zajonc, 1998). Observers can see even very small facial movements: a twitch of the mouth can carry a lot of information (Ambadar, Schooler, & Cohn, 2005; Ekman, 2009). Are emotional facial expressions innate or are they learned? And how are they used in communicating emotion?

Innate Expressions of Emotion

Charles Darwin noticed that some facial expressions seem to be universal (Darwin, 1872). He proposed that these expressions are genetically determined, passed on biologically from one generation to the next. The facial expressions seen today, said Darwin, are those that have been most effective over the centuries for telling others something about how a person is feeling, and thus what they are likely to say and do next (Shariff & Tracey, 2011). If someone is scowling with teeth clenched, for example, you will probably assume that the person is angry, and you won't choose that particular moment to ask for a loan (Marsh, Ambady, & Kleck, 2005).

Infants provide one source of evidence that some facial expressions are innate. Newborns do not have to be taught to grimace in pain, to smile in pleasure, or to blink when startled (Balaban, 1995). Even blind infants, who cannot imitate adults' expressions, show the same emotional expressions as do sighted infants (Goodenough, 1932). These emotional facial expressions help to provide caregivers with accurate information about babies' conditions and needs (Izard et al., 1980; Huebner & Izard, 1988).

Another line of evidence for innate facial expressions comes from studies showing that for the most basic emotions, people in all cultures show similar facial responses to similar emotional stimuli (Hejmadi, Davidson, & Rozin, 2000; Matsumoto & Willingham, 2006). Participants in these studies looked at photographs of people's faces and then tried to name the emotion each person was feeling. The pattern of facial movements we call a smile, for example, is universally related to positive emotions. Sadness is almost always accompanied by slackened muscle tone and a "long" face. Likewise, in almost all cultures, people contort their faces in a similar way when shown something they find disgusting. And a furrowed brow is frequently associated with frustration or unpleasantness (Ekman, 1994).

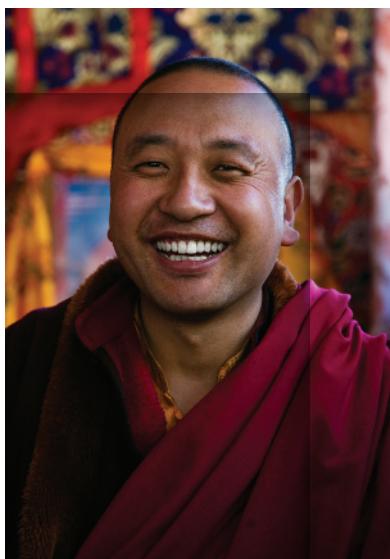
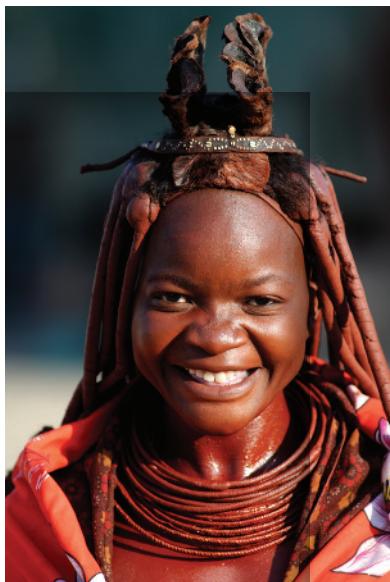
Anger is also linked with a facial expression recognized by almost all cultures. One study examined the ceremonial masks seen in eighteen Western and non-Western cultures



What Are They Feeling?

TRY THIS People's emotions are usually "written on their faces." Jot down what emotions you think these people are feeling, and then look at the answer shown at the bottom of page 370 to see how well you "read" their emotions.

AP Images/Ken Ruinard/Anderson Independent-Mail



The Universal Smile

The idea that some emotional expressions are inborn is supported by the fact that the facial movement pattern we call a smile is related to happiness, pleasure, and other positive emotions in cultures throughout the world.

*Tom Cockrem/Lonely Planet Images/Getty Images;
Craig Lovell/Photoshot*

(Aronoff, Barclay, & Stevenson, 1988). In all these cultures, angry, threatening masks contained similar elements, such as triangular eyes and diagonal lines on the cheeks. In particular, angular and diagonal elements carry the impression of threat. “Scary” Halloween pumpkins tend to include these patterns, too.

Social and Cultural Influences on Emotional Expression

Not all basic emotional expressions are innate or universal (Ekman, 1993; Jack et al., 2012). Some are learned through contact with a particular culture, and all of them, even innate expressions, are flexible enough to change in certain social situations (Fernández-Dols & Ruiz-Belda, 1995; Merluzzi, 2014; Todorov & Porter, 2014). For example, facial expressions become more intense and change more frequently when people are imagining social scenes as opposed to solitary scenes (Fridlund et al., 1990). Similarly, facial expressions in response to odors tend to be more intense when others are watching than when people are alone (Jancke & Kaufmann, 1994).

Further, although some basic emotional facial expressions are recognized by all cultures (Hejmadi, Davidson, & Rozin, 2000), even these can be interpreted differently depending on body language and environmental cues (Gendron et al., 2014b). For example, research participants interpreted a particular expression as disgust when it appeared on the face of a person who was holding a dirty diaper, but that same expression was seen as anger when it was digitally superimposed on a person in a fighting stance (Aviezer et al., 2008).

There is a certain degree of cultural variation when it comes to recognizing some emotions (Kayyal & Russell, 2013; Russell, 1995). In one study, Japanese and North Americans agreed about which facial expressions signaled happiness, surprise, and sadness, but they frequently disagreed about which faces showed anger, disgust, and fear (Matsumoto & Ekman, 1989). Members of cultures such as the Fore of Papua New Guinea agree even less with people in Western cultures on the labeling of facial expressions (Russell, 1994). People from different cultures may also differ in the way they interpret emotions expressed by tone of voice, or by a combination of vocal and facial cues (Gendron et al., 2014a; Mesquita & Frijda, 1992; Tanaka et al., 2010). An example is provided by a study showing that Taiwanese participants were best at recognizing a sad tone of voice, whereas Dutch participants were best at recognizing happy tones (Van Bezooijen, Otto, & Heenan, 1983).

People learn how to express some emotions by following cultural rules. Suppose you say, “I just bought a new car,” and your friends stick their tongues out at you. In North America, such a display may mean they are envious or resentful. But in some parts of China, it expresses surprise. Even smiles can vary as people learn to use them to communicate feelings. Paul Ekman and colleagues categorized seventeen types of smiles, including “false smiles,” which fake enjoyment, and “masking smiles,” which hide unhappiness. They named the smile that occurs with real happiness the *Duchenne smile* (pronounced “doo-SHEN”), after the French researcher who first noticed a difference between spontaneous, happy smiles and posed ones. A genuine Duchenne smile includes contractions of the muscles around the eyes (creating a distinctive skin wrinkle there) plus contractions of the muscles that raise the lips and cheeks. Few people can correctly mimic the muscle contractions around the eyes during a posed smile, so this feature can distinguish “lying smiles” from genuine ones (Frank, Ekman, & Friesen, 1993).

Learning about Emotions

The effects of learning are seen in a child’s growing range of emotional expressions. Although infants begin with a set of innate emotional responses, they soon learn to imitate facial expressions and use them to express a wide range of emotions. In time, these expressions become more precise and personalized, so that a particular expression conveys a clear message to anyone who knows that person well.

The photo on page 369 shows the wife and daughter of a U.S. Army soldier waving goodbye as his unit departs for training prior to deployment in a war zone. Their emotions probably included sadness, anxiety, worry, dread, uncertainty, hope, and perhaps anger.

If facial expressions are too personalized, however, no one will know what the expressions mean and so they will not cause others to respond. Operant shaping, described in the chapter on learning, probably helps keep emotional expressions within certain limits. If you could not see other people's facial expressions or observe their responses to yours, you might show fewer, or less intense, facial signs of emotion. In fact, as congenitally blind people grow older, their facial expressions tend to become less animated (Izard, 1977; Matsumoto & Willingham, 2009).

As children grow, they learn an *emotion culture*—rules that govern what emotions are appropriate in what circumstances and what emotional expressions are allowed (Chen, Kennedy, & Zhou, 2012). These rules can vary between genders and from culture to culture (e.g., Matsumoto et al., 2005; Tsai, Levenson, & McCoy, 2006). For example, TV news cameras showed that men in the U.S. military being deployed to a war zone tended to keep their emotions in check as they said goodbye to wives, girlfriends, and parents. However, many male soldiers in Italy—where mother-son ties are particularly strong—wailed with dismay and wept openly as they left. In a laboratory study, when viewing a distressing movie with a group of peers, Japanese students exerted much more control over their facial expressions than did North American students. When they watched the film while alone, however, the Japanese students' faces showed the same emotional expressions as those of the North American students (Ekman, Friesen, & Ellsworth, 1972).

Emotion cultures shape how people describe and categorize feelings, resulting in both similarities and differences across cultures (Russell, 1991). At least five of the seven basic emotions listed in an ancient Chinese book called the *Li Chi*—joy, anger, sadness, fear, love, liking, and dislike—are considered primary emotions by most Western theorists. Yet even though English has more than five hundred emotion-related words, some emotion words in other languages have no English equivalent. Similarly, other cultures have no equivalent for some English emotion words.

Learning about emotions appears to be crucial to social development. Evidence from humans and rhesus monkeys suggests that impaired ability to recognize and imitate others' facial expressions is associated with poor social adjustment and, possibly, some forms of autistic spectrum disorder (e.g., Kothari et al., 2013; Poljac, Poljac, & Wagemans, 2013; Tseng et al., 2013).

Social Referencing

Facial expressions, tone of voice, body postures, and gestures can do more than communicate emotion. They can also influence other people's behavior, especially people who are not sure what to do (e.g., Blechert et al., 2012; Howell & Shepperd, 2012). An inexperienced chess player, for instance, might reach out to move the queen, catch sight of a spectator's pained expression, and infer that another move would be better. Poker players often rely on their opponents' telltale facial expressions for cues about whether to bet, and how much (Schlicht et al., 2010). The process of letting another person's emotional state guide our own behavior is called *social referencing* (Campos, 1980). This process begins early; even three-month-old infants will look in the direction in which an adult's eyes have moved (Hood, Willen, & Driver, 1998).

The visual-cliff studies described in the sensation and perception chapter have been used to create an uncertain situation for infants. To reach its mother, an infant in these experiments must cross the visual cliff. If the apparent drop-off is very small or very large, there is no doubt about what to do. One-year-olds crawl across in the first case and stay put in the second case. However, if the apparent drop-off is just large enough (say, two feet) to create uncertainty, the infant relies on its mother's facial expressions to decide what to do. In one study, mothers were asked to make either a fearful or a joyful face. When the mothers made a fearful face, no infant crossed the glass floor. But when they made a joyful face, most infants crossed (Sorce et al., 1981). This result showed the adaptive value of sending, and receiving, emotional communications.

LINKAGES

As noted in the introductory chapter, all psychology subfields are related to one another. Our discussion of motivational conflicts and stress illustrates just one way that the topic of this chapter, motivation and emotion, is linked to the subfield of health psychology, discussed in the chapter on health, stress, and coping. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they fit together and help you better appreciate the big picture of psychology.

CHAPTER 10 Motivation and Emotion



LINKAGES

How does the brain know when we're hungry?



CHAPTER 3
Biological Aspects of Psychology

Can motivational conflicts cause stress?



CHAPTER 12
Health, Stress, and Coping

Why do some people take more risks than others?



CHAPTER 13
Personality

SUMMARY

Motivation refers to factors that influence the initiation, direction, intensity, and persistence of behavior. Emotions and motivation are often linked: motivation can influence emotions, and people are often motivated to seek certain emotions.

Concepts and Theories of Motivation

Where does motivation come from?

Focusing on a **motive** often reveals a single theme within apparently diverse behaviors. The many sources of motivation fall into five categories: physiological factors, needs, emotional factors, cognitive factors, and social factors.

An early argument held that motivation is based on **instinctive behaviors**—automatic, involuntary, and unlearned action patterns consistently “released” by particular stimuli. Modern versions of this **instinct doctrine** are seen in evolutionary accounts of helping, aggression, mate selection, and other aspects of social behavior. **Drive reduction theory** is based on **homeostasis**, a tendency to maintain equilibrium in a physical or behavioral process. When

disruption of equilibrium creates **needs** of some kind, people are motivated to reduce the resulting **drives** by behaving in some way that satisfies the needs and restores balance. **Primary drives** are unlearned; **secondary drives** are learned. According to the **arousal theory** of motivation, people are motivated to behave in ways that maintain a level of **physiological arousal** that is optimal for their functioning. Finally, **incentive theory** highlights behaviors that are motivated by attaining desired stimuli (positive incentives) and avoiding undesirable ones (negative incentives).

When behavior is based mainly on **intrinsic motivation**, it occurs simply for the pleasure and satisfaction that it brings. Behavior based mainly on **extrinsic motivation** is aimed at an external goal such as winning a prize or avoiding a penalty.

Hunger and Eating

What makes me start eating and stop eating?

Eating is controlled by a complex mixture of learning, culture, and biochemistry. The desire to eat (**hunger**) and the satisfaction

(**satiation**) of that desire (**satiety**) that leads us to stop eating depend on signals from the gut and from blood-borne substances such as glucose, fatty acids, amino acids, insulin, and leptin. Activity in the ventromedial nucleus of the hypothalamus results in satiety, whereas activity in the lateral hypothalamus results in hunger. Other areas of the hypothalamus, such as the paraventricular nucleus, are also involved. Further, several neurotransmitters act in various regions of the hypothalamus to motivate the eating of certain types of foods. Eating may also be influenced by the flavor of food and by the pleasure it can bring. Food selection is influenced by many factors, including social contexts and cultural traditions.

Obesity has been linked to overconsumption of certain kinds of foods, low energy metabolism, genetic factors, and even viruses. People suffering from **anorexia nervosa** starve themselves. Those who suffer from **bulimia** engage in binge eating, followed by purging through self-induced vomiting or laxatives. Those with **binge eating disorder** engage in food binges, but do not purge.

Sexual Behavior

How often does the average person have sex?

Sexual motivation and behavior result from a rich interplay of biology and culture. Sexual stimulation produces a **sexual response cycle**, a predictable physiological pattern of **sexual arousal** before, during, and after sexual activity. **Sex hormones**, which include male hormones (**androgens**) and female hormones (**estrogens** and **progestational hormones**, or **progesterins**), occur in different relative amounts in both sexes. They can have organizing effects, which create physical differences in the brain, and activating effects, which temporarily increase the desire for sex.

Gender-role learning, educational experiences, media influences, and family dynamics are examples of cultural factors that can bring about variations in sexual attitudes and behaviors. Sexual orientation—**heterosexuality**, **homosexuality** (gay or lesbian), or **bisexuality**—is increasingly viewed as a sociocultural variable that affects many other aspects of behavior and mental processes. Although undoubtedly shaped by a lifetime of learning, sexual orientation appears to have strong biological roots.

Achievement Motivation

Why do some people try harder than others to succeed?

People gain esteem from achievement in many areas, including the workplace. The motive to succeed is called **achievement motivation**, or the **need for achievement**. Individuals with high achievement motivation strive for excellence, persist despite failures, and set challenging but realistic goals.

Workers are most satisfied when they are working toward their own goals and getting concrete feedback. Jobs that offer clear and specific goals, a variety of tasks, individual responsibility, and other intrinsic rewards are the most motivating. People tend to have a characteristic level of happiness, or **well-being**, that is not necessarily related to the attainment of money, status, or other material goals.

Relations and Conflicts among Motives

Which motives move me most?

People's behavior reflects many motives, some of which may be in conflict. Maslow proposed a hierarchy of five types of human motives, from meeting basic physiological needs to attaining self-actualization. Motives at the lowest levels, according to Maslow, must be at least partially satisfied before people can be motivated by higher-level goals. Alderfer's three-level version does not assume that needs must be met in a particular order.

Four types of motivational conflict have been identified: approach-approach, avoidance-avoidance, approach-avoidance, and multiple approach-avoidance conflicts. These conflicts act as stressors, and people caught in them often experience physical and psychological problems.

The Nature of Emotions

How do feelings differ from thoughts?

Emotions are temporary experiences with negative or positive qualities that are felt with some intensity as happening to the self, are generated in part by interpretation of a situation, and are accompanied by both learned and innate physical responses.

Several brain mechanisms are involved in emotions, including the amygdala in the limbic system. The expression of emotions through involuntary facial movement is controlled by the extrapyramidal motor system. Voluntary facial movements are controlled by the pyramidal motor system. The brain's right and left hemispheres play somewhat different roles in emotions. In addition to specific brain mechanisms, both the **sympathetic nervous system** and the **parasympathetic nervous system**, which are divisions of the autonomic nervous system, are involved in physiological changes that accompany emotional activation. The **fight-flight reaction** (or **fight-or-flight syndrome**), for example, follows from activation of the sympathetic nervous system.

Theories of Emotion

Are emotions in the heart, in the head, or both?

James said that peripheral physiological responses are the primary source of emotions and that awareness of these responses creates emotional experience. James's peripheral theory is supported by evidence that, at least for several basic emotions, physiological responses are distinguishable enough for emotions to be generated in this way. Distinct facial expressions are linked to particular patterns of physiological change.

Cannon's central theory of emotions proposes that emotional experience is independent of bodily responses and that there is a direct experience of emotions based on activity of the central nervous system. Updated versions of this theory suggest that various parts of the central nervous system may be involved in different emotions and different aspects of emotional experience. Some pathways in the brain, such as the pathway from the thalamus to the amygdala, allow strong emotions to occur before conscious thought can take place. Specific parts of the brain appear to be responsible for the feelings of pleasure or pain in emotions.

Cognitive theories of emotions include the Schachter-Singer theory. It suggests that physiological responses are primary sources of emotion but that interpretation of these responses in light of the situation is required to label the emotion. This interpretation process depends on **attribution**. Attributing arousal from one situation to stimuli in another situation is explained by **excitation transfer theory**, which suggests that physiological arousal stemming from one situation can intensify the emotion experienced in a second situation. Other cognitive theorists such as Lazarus have argued that emotional experience is significantly affected by how we interpret events themselves, not just by how we interpret physiological responses to those events.

Communicating Emotion

Which emotional expressions are innate, and which are learned?

In humans, emotions can be communicated by words, voice tones, postures, bodily movements, and facial movements and expressions.

Darwin suggested that certain facial expressions of emotions are innate and universal and that these expressions evolved because they effectively communicate one creature's emotional condition to other creatures. Some facial expressions of basic emotions do appear to be innate, and certain facial movements are universally associated with certain emotions.

Other emotional expressions are learned, and even innate expressions are modified by learning and social contexts. As children grow, they learn an emotion culture, the rules of emotional expression appropriate to their culture. Accordingly, the same emotion may be communicated by different facial expressions in different cultures. Especially in ambiguous situations, one person's emotional expressions may serve to guide another person's behavior, a phenomenon called **social referencing**.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. Although most researchers do not believe in instinct theories of motivation, psychologists who advocate _____ theory argue that many aspects of human behavior are motivated by efforts to pass on our genes to the next generation.
 - a. drive reduction
 - b. evolutionary
 - c. arousal
 - d. incentive
2. Steve is cold, so he turns up the thermostat in his house. As soon as it starts to get too warm, the thermostat shuts off the furnace. This process is similar to the biological concept of _____.
 - a. homeostasis
 - b. secondary drive
 - c. incentive
 - d. arousal
3. Lisbeth and Harriet work as instructors in an exercise class. After class, Lisbeth prefers to go home and read quietly, whereas Harriet is ready to party. Which theory of motivation *best* explains the difference between these two women?
 - a. Drive reduction
 - b. Instinct
 - c. Evolutionary
 - d. Arousal
4. Monica wants her daughter to get high grades, so she offers her \$10 for each A that she earns and \$5 for each B. Monica appears to believe in the _____ theory of motivation.
 - a. drive reduction
 - b. incentive
 - c. evolutionary
 - d. arousal
5. Ahmed is desperate to lose weight. To keep from eating, he buys an electrical device that allows him to stimulate various areas of his brain. Which areas should he stimulate if he wants his brain to help him reduce food intake?
 - a. Ventromedial nucleus and paraventricular nucleus
 - b. Lateral hypothalamus and ventromedial nucleus
 - c. Lateral hypothalamus and paraventricular nucleus
 - d. Thalamus and pineal gland
6. Ronia is on a diet—again! She is *most* likely to eat less food if she _____.
 - a. eats only with friends, never alone
 - b. eats only one or two kinds of food at each meal
 - c. changes her food culture
 - d. focuses on the flavor of what she eats
7. Dr. Stefan is working in the emergency room when a very dehydrated young woman comes in. She is of normal weight, but a medical exam reveals nutritional imbalances and intestinal damage. The woman is *most* likely suffering from _____.
 - a. anorexia nervosa
 - b. bulimia
 - c. binge eating disorder
 - d. ventromedial disorder

8. The University of Chicago's National Health and Social Life Survey found that people in the United States _____.
- are more sexually active than previously thought
 - have sex more often if they are not in an exclusive relationship
 - have sex less often and with fewer people than previously thought
 - do not enjoy sex very much
9. According to the Thinking Critically section of this chapter, sexual orientation is *most* likely influenced by _____.
- prenatal hormones
 - genetic factors
 - sociocultural learning
 - all of the above
10. Edwina wants her son, Egbert, to develop high achievement motivation and to be successful in life. According to research on the need for achievement, Edwina should do all of the following *except* _____.
- encourage Egbert to try difficult tasks
 - encourage Egbert to avoid failure at all costs
 - give praise and rewards for success
 - read achievement-oriented stories to him
11. Liang wants his employees to work hard. As a psychologist specializing in motivation, you tell Liang that the *best* way to increase employees' performance is to _____.
- increase their pay and benefits
 - allow them to set their own goals
 - remind them regularly of the need to do better
 - keep all tasks as simple as possible
12. According to Maslow, which of the following would you *most* likely do first if you were shipwrecked on a desert island?
- Look for food and fresh water
 - Look for shelter
 - Start keeping a diary
 - Build a fire
13. Jill would like to send her son to an expensive private school, but this would create a financial hardship for her. Jill is faced with a(n) _____ motivational conflict.
- approach-approach
 - avoidance-avoidance
 - approach-avoidance
 - multiple approach-avoidance
14. Which of the following is *not* a characteristic associated with emotions? They _____.
- tend to last a relatively short time
 - can be triggered by thoughts
 - are always intense
 - can motivate behavior
15. When people are afraid to do something, they are said to have "cold feet." The fact that fear is associated with decreased blood flow to the feet and hands supports _____ theory of emotion.
- James's peripheral
 - Cannon's central
 - Schachter's cognitive
 - Lazarus's cognitive
16. After she finished a vigorous workout, Lydia saw Thaddeus walk into the gym and instantly fell in love. This is an example of _____, which is consistent with _____ theory of emotion.
- social referencing; James's
 - social referencing; Schachter's
 - excitation transfer; James's
 - excitation transfer; Schachter's
17. When Yatsira saw someone trying to open her car door while she was stopped at a light, her heart raced and at the exact same time she felt fear. This is *most* consistent with _____ theory of emotion.
- James's
 - Cannon's
 - Schachter's
 - Lazarus's
18. As Jarrod got older, he learned that he could not express his anger by throwing his toys. Jarrod is learning _____.
- to use facial feedback
 - Darwin's universal rules
 - to use social referencing
 - his emotion culture
19. Suppose that some friendly space aliens landed in your backyard. They tell you they want to learn how to communicate their emotions so that humans will understand them. What should you focus on teaching them?
- Body postures
 - Facial movements
 - Hand gestures
 - Voice inflections
20. Sam is unsure how to react to a comment from one of his friends, so he glances at his girlfriend, Diane, to see what her reaction is. In doing so, he is using _____.
- facial feedback
 - social referencing
 - attribution
 - excitation transfer

Human Development



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Preview

Infancy, childhood, adolescence, adulthood, and old age. These words can be read in seconds, but the stages they represent take a lifetime to play out. The story of development is different for each of us, but there are some common threads, too, and developmental psychologists are exploring them. In this chapter, we describe what they have discovered so far about how people change and grow over the course of their lives.

When he was eight years old, Jelani Freeman came home from school to find that his mentally ill mother was gone. She never came back. His father, whom he had never met, was in prison, so social workers arranged for him to live in a foster home. Over the next ten years he lived in six of them, in a series of slum neighborhoods in Rochester, New York. A few attempts were made to reunite him with his mother, but because of her mental condition, these reunions did not last long. His final placement, for a year and a half, was with an older sister who took him in on a foster-care basis but told him he would have to leave when he turned eighteen. As a teenager, his grades slipped, as did his school attendance, and when he asked a high school counselor about taking a college entrance examination, she told him the exam was for students who value education. Jelani took the test anyway and did well enough to get into college in Buffalo, New York, taking out loans, finding financial aid, and working several part-time jobs. After graduation, he won an internship at the U.S. Senate in Washington, DC, and then went on to complete a master's degree in history and then a law degree. Why did Jelani succeed, when the odds were so heavily against him from the beginning?

Developmental psychologists try to answer questions like these. They ask how and why some children are more resilient to stress than others, why some develop into well-adjusted, socially competent, caring individuals while others become murderers, or why some adolescents go on to win honors in college while others drop out of high school. They explore how genetics and the environment affect development through infancy, childhood, and adolescence, and analyze the extent to which development is a product of what we arrive with at birth—our inherited, biological *nature*—and the extent to which it is a product of what the world provides—the *nurture* of the environment. They explore the times when certain kinds of behavior first appear and how those behaviors change with age. They look into how development in one area, such as moral reasoning, relates to development in other areas, such as aggressive behavior. Developmental psychologists attempt to discover whether everyone develops at the same rate and if not, whether slow starters ever catch up to early bloomers. They also study the development that occurs over the years of adulthood and try to determine how these changes are related to earlier abilities and the events of life. In short, **developmental psychology** is concerned with the course and causes of developmental changes over a person's entire lifetime.

This chapter focuses on many of these changes, beginning with the physical and biological changes that take place from the moment of conception to the moment of birth.

EXPLORING HUMAN DEVELOPMENT

What does "genetic influence" mean?

Philosophical arguments about how nature and nurture affect development are centuries old. In the 1690s, British empiricist philosopher John Locke wrote about the importance of nurture. He argued that what happens in childhood profoundly and permanently affects an individual. Empiricists saw the newborn as a blank slate, or *tabula rasa*. Adults write on that slate, said Locke, as they teach children about the world and how to behave in it. About seventy years later, French philosopher Jean-Jacques Rousseau argued just the opposite, claiming that children are capable of discovering how the world operates and how they should behave without instruction from adults. Rousseau wrote that children should be allowed to grow as nature commands, with little guidance or pressure from parents.

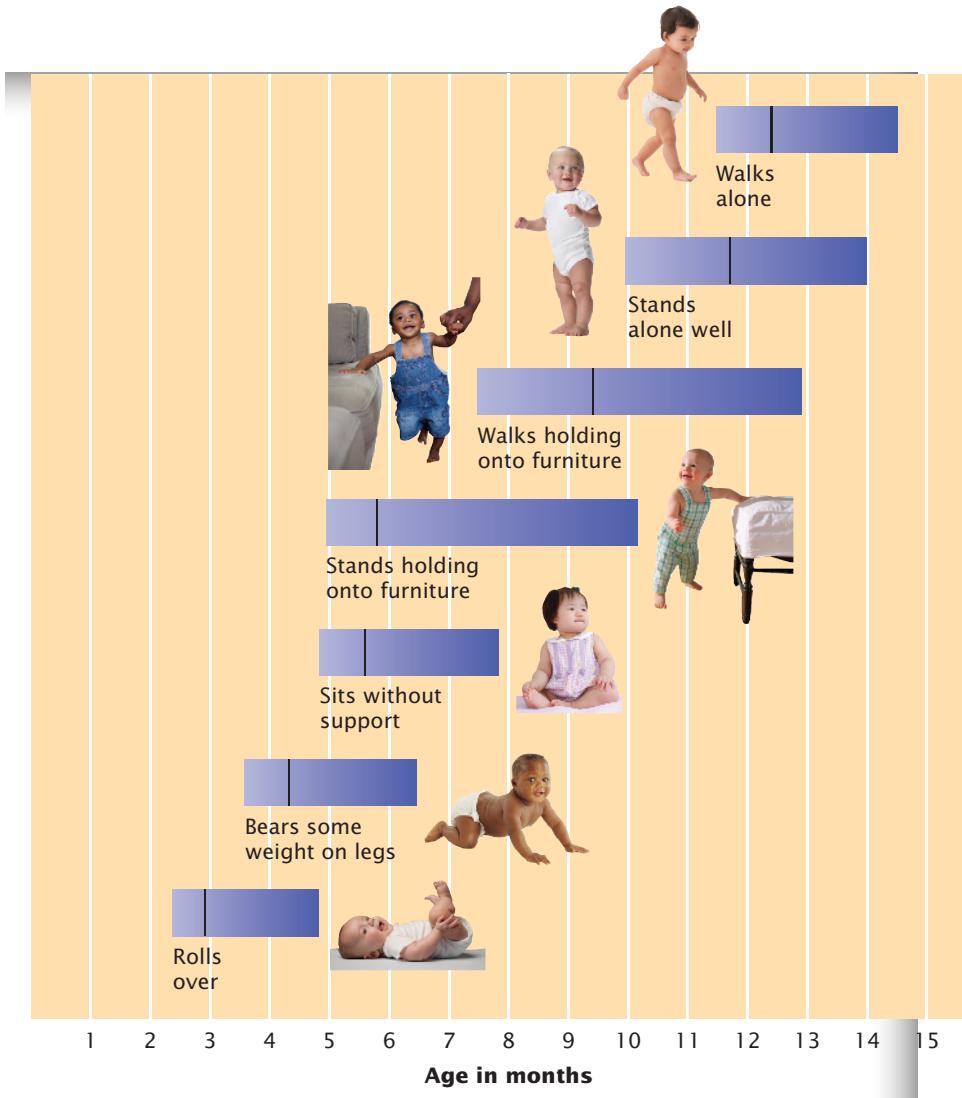
The first American psychologist to study systematically the role of nature in behavior was Arnold Gesell (pronounced “geh-ZELL”). In the early 1900s, Gesell observed children of all ages. He found that motor skills —such as standing and walking, picking up a cube, and throwing a ball— develop in a fixed sequence of stages in all children, as illustrated in Figure 11.1. Gesell argued that the order of the stages and the ages when they appear are decided by nature, mostly unaffected by nurture. Only under extreme conditions, such as famine, war, or poverty, he claimed, might children deviate from their biologically programmed timetable. This type of natural growth or change, which unfolds in a fixed

developmental psychology The psychological specialty that documents the course of people's social, emotional, moral, and intellectual development over the life span.

FIGURE 11.1**Motor Development**

When did you start walking? The left end of each bar indicates the age at which 25 percent of infants were able to perform a particular behavior; 50 percent of the babies were performing the behavior at the age indicated by the vertical line in the bars; the right end indicates the age at which 90 percent could do so (Frankenberg & Dodds, 1967). Although different infants, especially in different cultures, achieve milestones of motor development at slightly different ages, all infants—regardless of their ethnicity, social class, or temperament—achieve them in the same order.

Design Pics/Kelly Redinger/Getty Images; Elyse Lewin/The Image Bank/Getty Images; Mastering_Microstock/Shutterstock; Liz Banfield/Photolibrary/Getty Images; Rayes/Digital Vision/Jupiterimages; Ryan McVay/The Image Bank/Getty Images; Blend Images - KidStock/Brand X Pictures/Getty Images



sequence relatively independent of the environment, is called **maturation**. The broader term *development* encompasses not only maturation but also the behavioral and mental processes that are influenced by learning.

John B. Watson disagreed with Gesell's views. He argued that the environment, not nature, shapes development. As described in the introductory chapter, Watson founded the behaviorist approach to psychology. In the early 1900s, he began conducting experiments with children, from which he concluded that children learn *everything*, from skills to fears. In his words, "There is no such thing as an inheritance of capacity, talent, temperament, mental constitution and characteristics. These things ... depend on training that goes on mainly in the cradle" (Watson, 1925, pp. 74–75).

It was Swiss psychologist Jean Piaget (pronounced "pee-ah-ZHAY") who first suggested that nature and nurture work together and that their influences are inseparable and interactive. Through a series of books published from the 1920s until his death in 1980, Piaget influenced the field of developmental psychology more than any other person before or since (Flavell, 1996).

maturation Natural growth or change triggered by biological factors independent of the environment.

Understanding Genetic Influence

Most developmental psychologists now accept Piaget's idea that both nature and nurture contribute to development. Guided by research in *behavioral genetics*, the study of



Nature and Nurture Entwined

The combined effects of nature and nurture are illustrated in this family photo of Eli and Peyton Manning and their father, Archie Manning. The effect of nature on their athleticism could be seen in the fact that both boys weighed over twelve pounds at birth and were built like athletes, even as toddlers. The influence of nurture on their success—both are quarterbacks in the National Football League (NFL)—came about partly through the fact that their father was an NFL quarterback too. Their family life revolved around sports; they were tossing a football at the age of three—and honing their skills with help from their father's coaching.

Charles Eshelman/FilmMagic/Getty Images



A Fetus at Twelve Weeks

In this photo of a fetus at three months after conception, the umbilical cord and placenta are clearly visible. At this point in prenatal development, the fetus can kick its legs, curl its toes, make a fist, turn its head, squint, open its mouth, swallow, and take a few "breaths" of amniotic fluid.

Zuber/Custom Medical Stock Photo

how genes affect behavior, they explore how genes and the environment influence specific aspects of development (Loehlin, 2010). Their studies have demonstrated that nature and nurture jointly affect development in two ways. First, nature and nurture operate together to make all people *similar* in some ways. For example, because of nature we achieve motor development milestones in the same order and at roughly the same rate. But supportive nurture, in the form of proper nutrition and exercise, is also necessary to allow normal maturation to unfold. Second, nature and nurture operate together to make each person *unique*. The nature of inherited genes and the nurture of diverse family and cultural environments produce differences among individuals in athletic abilities, intelligence, speech patterns, personality, and many other dimensions (e.g., Benjamin & Taylor, 2010; Bleidorn et al., 2010; Boutwell et al., 2011; Hopwood et al., 2011; Nigg, Nikolas, & Burt, 2010).

Genes and the Environment

Just how much nature and nurture contribute varies from one characteristic to another. For some characteristics, such as physical size and appearance, nature's influence is so strong that only extreme environmental conditions affect them. For example, 80 to 95 percent of the differences in height that we see among people are due to their genes. Less than 20 percent of the differences are due to prenatal or postnatal diet, early illness, or other growth-stunting environmental factors. Nature's influence on other characteristics, such as intelligence or personality, is less strong. These complex traits are influenced by genes and by many environmental factors as well.

It is impossible for researchers to separate the influences that nature and nurture exert on such complex traits, partly because heredity and environment are forever intertwined (Perovic & Radenovic, 2011). For instance, highly intelligent biological parents give their children genes related to high intelligence, and typically provide a stimulating environment too. Heredity and environment also influence each other. The environment promotes or hampers the expression of an individual's abilities, and those inherited abilities affect the individual's environment (e.g., Mitchell et al., 2014). For example, a stimulating environment full of toys, books, and lessons encourages children's mental development and increases the chances that their full inherited intelligence will emerge. At the same time, more-intelligent children seek out environments that are more stimulating, ask more questions, draw more attention from adults, and ultimately learn more from these experiences.

In short, heredity creates *predispositions* that interact with environmental influences, including family and teachers, books and computers, and friends and random events (Caspi et al., 2002). This interaction produces the developmental outcomes we see in individuals (e.g., Lahey et al., 2011; Tucker-Drob & Harden, 2012a, 2012b). So Michael Jordan, Michael Phelps, Michael Douglas, and Michael Moore differ from one another and from other men because of both their genes and their experiences. Let's now consider how it all begins.

BEGINNINGS

Why should pregnant women stay away from tobacco and alcohol?

Nowhere are the intertwined contributions of heredity and environment clearer than during the eventful nine months before birth, when a single fertilized egg develops into a functioning newborn infant.

Prenatal Development

The process of development begins when sperm from a father-to-be fertilizes the egg of a mother-to-be and forms a brand-new cell. Most human cells contain forty-six

chromosomes, arranged in twenty-three matching pairs. Each chromosome hosts thousands of **genes**, the biochemical units of heredity that govern the development of an individual. Genes, in turn, are made of **DNA (deoxyribonucleic acid)**. The DNA in genes provides coded messages that serve as blueprints to construct a physical human being, including eye color, height, blood type, inherited disorders, and the like. All of this information fits in less space than the period that ends this sentence.

New cells in the body are constantly being produced by the division of existing cells. Most cells divide through *mitosis*, a process in which the cell's chromosomes duplicate themselves so that each new cell contains copies of the twenty-three pairs of chromosomes in the original cell.

A different kind of cell division, called *meiosis*, occurs in the formation of a male's sperm cells and a female's egg cells. In meiosis, the chromosome pairs are not copied, but are randomly split and rearranged, leaving each new sperm and egg cell with just one member of each chromosome pair, or twenty-three *single* chromosomes. No two of these special new cells are quite the same, and none contains an exact copy of the person who produced it. So, at conception, when a male's sperm penetrates and *fertilizes* the female's ovum, a truly new cell is formed. The fertilized cell, called a *zygote*, carries the usual twenty-three pairs of chromosomes, but half of each pair comes from the mother and half from the father. The zygote represents a unique heritage—a complete genetic code for a new person that combines randomly selected aspects from both parents. The zygote divides first into copies of itself; then it continues to divide into billions of specialized cells to form a complete new human being (see the behavioral genetics appendix).

Stages of Prenatal Development

The first two weeks after conception are the *germinal stage* of development. By the end of this stage, the cells of the dividing zygote have formed an **embryo**. In the *embryonic stage* of development, the embryo quickly forms a heart, nervous system, stomach, esophagus, and ovaries or testes. By two months after conception, when the embryonic stage ends, the embryo looks decidedly human, with eyes, ears, nose, jaw, mouth, and lips. The tiny arms have elbows, hands, and stubby fingers and the legs have knees, ankles, and toes.

The seven-month period remaining until birth is the *fetal stage* of prenatal development. During this stage, the various organs grow and start to function. By the end of the third month, the **fetus** can kick, make a fist, turn its head, open its mouth, swallow, and frown. In the sixth month, the eyelids, which have been sealed, open. The fetus is now capable of making sucking movements and has taste buds, eyebrows, eyelashes, and a well-developed grasp.

By the end of the seventh month, the organ systems, though immature, are all functional. In the eighth and ninth months, fetuses can respond to light and touch and can hear what is going on outside. They can remember a particular sound or melody heard a month earlier (Dirix et al., 2009; Granier-Deferre et al., 2011), and when hearing an unpleasant sound, they may respond with movements like those of a crying newborn (Gingras, Mitchell, & Grattan, 2005). They can also learn. When they hear their mother's familiar voice, their heart beats a little faster, but it slows if they hear a stranger (Kisilevsky et al., 2003).

Prenatal Risks

During prenatal development, a spongy organ called the *placenta* appears and attaches itself to the mother's uterus through an *umbilical cord*. (The cord is detached at birth, but you can see where yours was by looking at your navel.) The placenta sends nutrients from the mother to the developing baby and carries away waste. It also screens out many potentially harmful substances, including most bacteria. This screening is imperfect, however: gases, microorganisms, and some drugs pass through. Damage can occur if the baby's mother uses certain drugs, is exposed to some toxic substances such as mercury, or has certain illnesses while organs form in the embryonic stage (Koger, Schettler, & Weiss, 2005).

chromosomes Structures in every biological cell that contain genetic information in the form of genes.

genes Hereditary units, located on chromosomes, that contain biological instructions inherited from both parents, providing the blueprint for physical development.

DNA (deoxyribonucleic acid) The molecular structure of a gene that provides the genetic code.

embryo The developing individual from two weeks to two months after fertilization.

fetus The developing individual from the third month after conception until birth.



A Rare Multiple Birth

When Nadya Suleman delivered eight babies on January 26, 2009, it was only the second time that octuplets have been known to survive for more than a few hours. The infants remained at severe risk for a considerable time, though, because they were premature and underweight (the heaviest was 3 pounds, 4 ounces, and the lightest only 1 pound, 8 ounces).

AP Images/Ron Siddle

Harmful external substances that invade the womb and result in birth defects are called **teratogens**. Teratogens especially matter in the embryonic stage, because it is a **critical period** in prenatal development, a time during which certain kinds of development must occur if they are going to occur at all. If the heart, eyes, ears, hands, and feet do not appear during the embryonic stage, they cannot form later on. If they form incorrectly, the defects will be permanent. So even before a mother knows she is pregnant, her embryo can be damaged by teratogens. For example, a baby whose mother had rubella (German measles) during the third or fourth week after conception has a 50 percent chance of being born blind, deaf, intellectually disabled, or having a malformed heart. But, if the mother had rubella later in the pregnancy, after the infant's eyes, ears, brain, and heart have formed, such defects are less likely. Unlike earlier stages of pregnancy, during the fetal stage, teratogens affect a baby's size, behavior, intelligence, and health rather than the formation of organs and limbs.

Defects due to teratogens are most likely to appear when the negative effects of nature and nurture combine. The worst-case scenario is when a genetically vulnerable infant receives a strong dose of a damaging substance during a critical period of prenatal development (Huizink, Mulder, & Buitelaar, 2004; Van den Bergh & Marcoen, 2004).

Of special concern are the effects of drugs on infants' development. Pregnant women who use substances such as cocaine create a substantial risk for their fetuses, which do not yet have the enzymes necessary to break down the drugs. "Cocaine babies" or "crack babies" may be born premature, underweight, tense, and fussy (Tronick et al., 2005). They may also suffer delayed physical growth and motor development (Shankaran et al., 2011) and they are more likely to have behavioral and learning problems (Levine et al., 2012). However, other aspects of their cognitive abilities are not necessarily different from those of any baby born into an impoverished environment (Behnke et al., 2006; Jones, 2006). How well these crack babies ultimately do depends on how supportive their childhood environments turn out to be (e.g., Ackerman, Riggins, & Black, 2010).

Alcohol is another potent teratogen. It affects infants' brain development (Sayal et al., 2009) and can cause stunted growth, developmental delay, fine motor dysfunction, and genetic abnormalities (Day, 2012). Almost half the children born to mothers who abuse alcohol will develop **fetal alcohol syndrome**, a pattern of defects that includes intellectual disability (O'Leary et al., 2013). Even drinking a glass or two of wine a day can produce a baby with decreased intellectual functioning (Roussotte et al., 2012). Bouts of heavy drinking triple the odds that the child will develop alcohol-related problems by age twenty-one (Baer et al., 2003; Landgren et al., 2010). The effects of prenatal exposure to alcohol are even more severe when combined with the effects of other environmental toxins, such as air pollution (Arruda et al., 2011).

Smoking also affects a developing fetus. Smokers' babies often have respiratory problems, allergies, irritability, and attention problems, and a greater risk for nicotine addiction, insulin resistance, and behavioral problems in adolescence and adulthood (Espy et al., 2011; Tanaka & Miyake, 2011; Thiering et al., 2011; Verhagen et al., 2011). Worse, they may be born prematurely, and they are usually underweight.

The risk of low birth weight and later complications is also higher when mothers, during the first six months of their pregnancy, experience significant stress or depression, or get the flu (Brown et al., 2005; Hay et al., 2010; Khashan et al., 2008). Babies who are premature and/or underweight—for whatever reason—more often have cognitive, emotional, and behavioral problems that continue throughout their lives (Doyle & Anderson, 2010; Evrard et al., 2011; Kerstjens et al., 2011; Nosarti et al., 2012; Rogers et al., 2012). However, mild degrees of maternal anxiety or depression (DiPietro et al., 2006) or anxiety that occurs later during the pregnancy (Davis & Sandman, 2010; DiPietro et al., 2010) may actually advance development of the fetus and infant. Fortunately, mental or physical problems resulting from a harmful prenatal factor affect fewer than 10 percent of babies born in Western nations.

teratogens Harmful substances, such as alcohol and other drugs, that can cause birth defects.

critical period An interval during which certain kinds of growth must occur if development is to proceed normally.

fetal alcohol syndrome A pattern of defects found in babies born to women who abused alcohol during pregnancy.



A Baby's-Eye View of the World

The top photograph simulates what a mother looks like to her infant at three months of age. Although their vision is blurry, infants particularly seem to enjoy looking at faces.

Nelson, C. A. (1987). *The recognition of facial expressions in the first two years of life: Mechanisms of development*. *Child Development*, 58, 889–909.

The Newborn

Determining what newborns can see, hear, or do is a fascinating and frustrating challenge for researchers in developmental psychology. Babies are difficult to study because they sleep about 70 percent of the time. When they are not sleeping, they are drowsy, crying, awake, and active, or awake and inactive. It is only when they are in this latter state, which is infrequent and lasts only a few minutes, that psychologists can assess infants' abilities. To do so, they may show infants objects or pictures and record where they look and for how long. They film the infants' eye movements and pupil dilations, and note changes in heart rates, sucking rates, brain waves, body movements, and skin conductance (a measure of sweat that accompanies emotion) when objects are shown or sounds are made. From studies using these techniques, researchers have pieced together a fair picture of what infants can see and hear (e.g., Gredebäck, Johnson, & von Hofsten, 2009; Taylor & Herbert, 2013).

Vision and Other Senses

Infants can see at birth, but their vision is blurry. Researchers estimate that newborns have 20/300 eyesight. In other words, an object 20 feet away looks only as clear as it would if viewed from 300 feet by an adult with normal vision. The reason infants' vision is so limited is that their eyes and brains are not fully developed. Newborns' eyes are smaller than those of adults, and the cells in the fovea—the area in each eye on which images are focused—are fewer and far less sensitive. Infant eye movements are slow and jerky. And pathways from the eyes to the brain are inefficient, as is the processing of visual information within the brain.

Although infants cannot see small objects across the room, they can see large objects up close—the distance at which most interactions with caregivers take place. Infants look longest at moving objects, especially those that have large elements, clear contours, and a lot of contrast—all of which are features of the human face (Farroni et al., 2005; Turati, 2004).

Newborns actively use their senses to explore the world around them. At first, they attend to sights and sounds for only short periods. Gradually, their attention spans lengthen and their exploration becomes more systematic. In the first two months, they focus only on the edges of objects, but after that, they scan whole objects (Banks & Salapatek, 1983). Then, when they see an object, they get all the information they can from it before going on to something new (Hunter & Ames, 1988). Newborns stare at human faces longer than other figures (Valenza et al., 1996). They are particularly interested in eyes, as shown in their preference for faces that are looking directly at them (Farroni et al., 2002). Over time, older infants switch to look more at mouths, especially when a person is talking or making expressions (Frank, Vul, & Saxe, 2012; Tenenbaum et al., 2013). They look longer at faces showing happy emotions (Kim & Johnson, 2013). Soon, they become more able to recognize faces when the face is moving and talking (Guellai, Coulon, & Streri, 2011).

At two or three days of age, newborns can hear soft voices and notice differences between tones about one note apart on the musical scale (Aslin, Jusczyk, & Pisoni, 1998). In addition, they turn their heads toward sounds (Clifton, 1992). But their hearing is not as sharp as that of adults until well into childhood. This condition is not merely a hearing problem; it also reflects an inability to listen selectively to some sounds over others (Bargones & Werner, 1994). As infants grow, they develop sensory capacities and the skill to use them.

Infants pay special attention to speech. When they hear someone talking, they open their eyes wider and search for the speaker. Infants also prefer certain kinds of speech. They like rising tones spoken by women or children (Sullivan & Horowitz, 1983). They also like high-pitched, exaggerated, and expressive speech. In other words, they like to hear the “motherese,” or “baby talk,” used by most adults in all cultures when talking to babies. They even seem to learn language faster when they hear baby talk (Thiessen, Hill, & Saffran, 2005).

**FIGURE 11.2****Reflexes in the Newborn**

When a finger is pressed into a newborn's palm, the grasping reflex causes the infant to hold on tightly enough to suspend its entire weight. And when a newborn is held upright over a flat surface, the stepping reflex leads to walking movements.

Petit Format/J. DaCunha/Science Source

Newborns also like certain smells and tastes more than others. When given something sweet to drink, they suck longer and slower, pause for shorter periods, and smile and lick their lips (Ganchrow, Steiner, & Daher, 1983). They also prefer the flavors of food consumed by their mothers during pregnancy (Warren, 2011). When they smell their mother's breast, newborns become quiet, open their eyes, and try to suck (Doucet et al., 2007, 2009). Within a few days after birth, breastfed babies prefer the odor of their own mother's breast milk to that of another mother (Porter et al., 1992). In the presence of their mother's body odors, in fact, babies' preference for looking at faces (and eyes) is heightened (Durand et al., 2013).

Reflexes and Motor Skills

In the first weeks and months after birth, babies show involuntary, unlearned reactions called **reflexes**. These swift, automatic movements occur in response to external stimuli. Figure 11.2 illustrates the *grasping reflex*, one of more than twenty reflexes that have been observed in newborn infants. Another is the *rooting reflex*, whereby the infant turns its mouth toward a finger or nipple that touches its cheek. And the newborn exhibits the *sucking reflex* in response to anything that touches its lips. Many of these reflexive behaviors evolved because they help infants survive. The absence of reflexes in a newborn signals problems in nervous system development. So does a failure of reflexes to disappear during the first three or four months, when brain development allows the infant to control muscles voluntarily.

Voluntary control permits motor skill development, so the infant starts to roll over, sit up, crawl, stand, and walk. Until recently, most developmental psychologists accepted Gesell's view that except under extreme environmental conditions, these motor abilities occur spontaneously as the central nervous system and muscles mature. Research demonstrates, however, that maturation does not tell the whole story, even in normal environments (Thelen, 1995).

Consider the fact that many babies today aren't learning to crawl on time—or at all. Why? One reason has to do with the "Back to Sleep" campaign, launched in 1995 to prevent sudden infant death syndrome (see the chapter on consciousness). This public health campaign urges parents to put sleeping babies on their backs and not face down. The campaign has been successful, but researchers have discovered that many babies who were never placed on their tummies went directly from sitting to toddling, skipping the crawling stage but reaching all other motor milestones on schedule (Kolata & Markel, 2001). In contrast, the "Prone to Play" campaign, which began in 2001, advised parents to place awake babies in a prone (face down) position to encourage play and learning. Babies of parents who followed this advice did show earlier than expected skill at rolling, crawling on their abdomens, and crawling on all fours, but their ability to walk did not appear unusually early (Kuo et al., 2008).

Observation of infants as they learn to crawl has shown that it happens gradually. It takes the development of enough muscle strength to support the abdomen—and some active experimentation. Six infants in one study tried various crawling techniques—moving backward, moving one limb at a time, using the arms only, and so on (Freedland & Bertenthal, 1994). After a week or two of trial and error, all six infants arrived at the same method: moving the right arm and left leg together, then the left arm and right leg. This pattern turned out to be the best way to get around quickly without tipping over. Such observations suggest that as infants' strength increases, they try various motor patterns and select the ones that work best (Nelson, 1999).

In other words, motor development results from a combination of maturation and experience. It does not reflect an entirely automatic sequence that is genetically etched in the brain. Yet again, we see that nature and nurture affect each other. The brain controls developing behavior, but its own development is affected by experience, including efforts to build motor skills.

reflexes Simple, involuntary, unlearned behaviors directed by the spinal cord without instructions from the brain.

INFANCY AND CHILDHOOD: COGNITIVE DEVELOPMENT

How do babies think?

In less than ten years, a tiny infant becomes a person who can read a book, write a poem, and argue logically for a new computer. What leads to the dramatic shifts in thinking, knowing, and remembering that occur between early infancy and later childhood? Researchers studying *cognitive development* try to answer this question.

Changes in the Brain

One factor that underlies the cognitive leaps of infancy and childhood is brain development. When infants are born, they already have a full quota of brain cells, but the neural networks connecting cells are immature. With time, connections get more complex and then, with pruning, more efficient. As different brain areas develop more complex and efficient neural networks, new cognitive abilities appear (Nelson, Thomas, & de Haan, 2006).

In the first few months of infancy, the cerebellum is the most mature area of the brain. Its early maturation allows infants to display simple associative abilities, such as sucking more when they see their mother's face or hear her voice. Between six and twelve months of age, neurological development in the medial temporal lobe of the forebrain may help make it possible for infants to remember and imitate an action or to recognize an object. Neurological development in the frontal lobes, which occurs later in childhood, allows higher cognitive functions such as reasoning. In other words, brain structures provide the "hardware" for cognitive development. How does the "software" of thinking develop, and how does it modify the "wiring" of the brain's "hardware"? These questions have been pursued by many developmental psychologists, beginning with Jean Piaget.

The Development of Knowledge: Piaget's Theory

Piaget dedicated his life to a search for the origins of intelligence and the factors that lead to changes in knowledge over the life span. He was the first to chart the journey from the simple reflexes of newborns to the complex understandings of adolescents. Although his theory turned out to be incomplete (and in some ways incorrect), his ideas about cognitive development are still useful and still guide research.

Intensive observations of infants (including his own) and extensive interviews with children led Piaget to propose that cognitive development proceeds in a series of distinct periods. He believed that all children's thinking goes through the same periods, in the same order, without skipping. (Table 11.1 outlines these periods.) According to Piaget, infants' thinking is different from children's thinking, which is different from adolescents' thinking. He said that children are not just miniature adults and that they are not less intelligent than adults; they just think in completely different ways at different periods of development. In other words, entering each period involves a *qualitative* change from whatever preceded it, much as a caterpillar is transformed into a butterfly.

Building Blocks of Development

To explain how infants and children move to ever higher levels of understanding and knowledge, Piaget introduced the concept of *schemas* as the basic units of knowledge, the building blocks of intellectual development. As noted in other chapters, **schemas** are the generalizations that form as people experience the world. Schemas, in other words, organize past experiences and provide a framework for understanding future experiences.

At first, infants form simple schemas. For example, a sucking schema combines their experiences of sucking into images of what objects can be sucked on (bottles, fingers, pacifiers) and what kinds of sucking can be done (soft and slow, speedy and vigorous). Later, children form more complex schemas, such as a schema for tying a knot or making a bed. Still later, adolescents form schemas about what it is to be in love.

schemas Mental representations of what we know and expect about the world.

TABLE 11.1 PIAGET'S PERIODS OF COGNITIVE DEVELOPMENT

Period	Abilities and Achievements
Sensorimotor	
Birth–2 years	Infants discover aspects of the world through their sensory impressions, motor activities, and coordination of the two. They learn to differentiate themselves from the external world. They learn that objects exist even when they are not visible and that these objects are independent of the infants' own actions. Infants gain some appreciation of cause and effect.
Preoperational	
2–4 years	Children cannot yet manipulate and transform information in logical ways, but they now can think in images and symbols.
4–7 years	They become able to represent something with something else, acquire language, and play games of pretend. Intelligence at this stage is said to be intuitive because children cannot make general, logical statements.
Concrete operational	
7–11 years	Children can understand logical principles that apply to concrete external objects. They can appreciate that certain properties of an object remain the same, despite changes in appearance, and they can sort objects into categories. They can appreciate the perspective of another viewer. They can think about two concepts (such as longer and wider) at the same time.
Formal operational	
Over 11 years	Only adolescents and adults can think logically about abstractions, can speculate, and can consider what might or what ought to be. They can work in probabilities and possibilities. They can imagine other worlds, especially ideal ones. They can reason about purely verbal or logical statements. They can relate any element or statement to any other, manipulate variables in a scientific experiment, and deal with proportions and analogies. They can reflect on their own activity of thinking.

Two related processes guide this development: assimilation and accommodation. In **assimilation**, children take in information about new objects by trying out existing schemas and finding schemas that new objects will fit. They *assimilate* new objects into existing schemas. So when an infant gets a squeaker toy, he sucks on it, assimilating it into the sucking schema he developed with his bottle and pacifier. In the same way, a toddler who sees a butterfly for the first time may assimilate it into her “birdie” schema because, like a bird, it’s colorful and it flies. Now suppose an older toddler encounters a large dog. How she assimilates this new experience depends on her existing dog schema. If she has had positive experiences with the family dog, she will have a positive schema, and, expecting the dog to behave like her pet, she greets it happily. In other words, past experiences affect what and how children think about new ones.

assimilation The process of taking in new information about objects by using existing schemas on objects that fit those schemas.

accommodation The process of modifying schemas when they do not work on new objects.

Sometimes, like Cinderella’s stepsisters squeezing their oversized feet into the glass slipper, people distort information about a new object to make it fit an existing schema. When squeezing won’t work, though, people are forced to change, or *accommodate*, their schemas to the new objects. In **accommodation**, the person tries out familiar schemas on a new object, finds that the schemas cannot be made to fit the object, and changes the schemas so that they will fit (see Figure 11.3). So when the infant discovers that the squeaker toy is more fun when it makes a noise, he accommodates his sucking schema

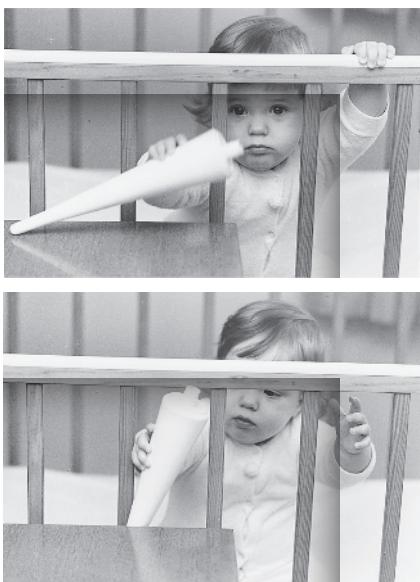


FIGURE 11.3
Accommodation

Because the bars of the crib are in the way, this child discovers that her schema for grasping and pulling objects toward her will not work. So she adjusts, or accommodates, her schema to achieve her goal.

© George S. Zimbel

and starts munching on the squeaker instead. When the toddler realizes that butterflies are not birds because they don't have beaks and feathers, she accommodates her "birdie" schema to include two kinds of "flying animals"—birds and butterflies. And if the child with the positive "doggie" schema meets a snarling stray, she discovers that her original schema does not extend to all dogs and refines it to distinguish between friendly dogs and aggressive ones.

Sensorimotor Development

Piaget (1952) called the first stage of cognitive development the **sensorimotor period**, a time when mental activity is confined to schemas about sensory functions, such as seeing and hearing, and schemas about motor skills, such as grasping and sucking. Piaget believed that during the sensorimotor period, infants can only form schemas of objects and actions that are present—things they can see, hear, or touch. They cannot think about absent objects, he said, because they cannot act on them. For infants, then, thinking *is* doing. They do not lie in the crib thinking about their mother or teddy bear, because they are not yet able to use schemas as *mental representations* of objects and actions that are not present.

The sensorimotor period ends when infants do become able to form such mental representations. At that point, they can think about objects or actions when the objects are not visible or the actions are not occurring. This milestone, according to Piaget, frees the child from the here and now of the sensory environment. It allows for the development of thought. One sign of this milestone is the child's ability to find a hidden object. This behavior reflects the infant's knowledge that an object exists even if it cannot be seen, touched, or sucked. Piaget called this knowledge **object permanence**.

Piaget concluded that before infants acquire knowledge of object permanence, they do not search for objects out of sight. For infants, out of sight is literally out of mind. He found evidence of object permanence when infants are four to eight months old. At this age, for the first time, they recognize a familiar object even if part of it is hidden: they know it's their bottle even if they can see only the nipple peeking out under the blanket. Infants now have some primitive mental representations of objects. If an object is completely hidden, however, they will not search for it.

Several months later, infants will search briefly for a hidden object, but their search is random and ineffective. Not until they are about eighteen to twenty-four months old, said Piaget, do infants appear able to picture and follow events in their minds. They look for the object in places other than where they saw it last, sometimes in entirely new places. According to Piaget, their concept of object permanence is now fully developed. They have a mental representation of the object that is completely separate from their immediate perception of it.

Preoperational Development

According to Piaget, the **preoperational period** follows the sensorimotor stage of development. During the first half of the period, children between the ages of two and four begin to understand, create, and use *symbols* that represent things that aren't present. They draw, pretend, and talk.

Using and understanding symbols opens up a new world for two- to four-year-olds. At two, for the first time, children play "pretend." They make their fingers "walk" or "shoot" and use a spoon to make a bridge. By the age of three or four, children can symbolize complex roles and events as they play "house," "doctor," or "superhero." They also can use drawing symbolically: pointing to their scribble, they might say, "This is Mommy and Daddy and me going for a walk."

During the second half of the preoperational period, according to Piaget, four- to seven-year-olds begin to make intuitive guesses about the world as they try to figure out how things work. However, Piaget observed that they cannot tell the difference between imagination and reality. For example, children in this age range might claim that dreams are real and take

sensorimotor period According to Piaget, the first period of cognitive development, when the infant's mental activity is confined to sensory perception and motor skills.

object permanence The knowledge that an object exists even when it is not in view.

preoperational period According to Piaget, the second period of cognitive development, during which children begin to understand, create, and use symbols that represent things that are not present.



Testing for Conservation

TRY THIS If you know a child who is between the ages of four and seven, get parental permission to test the child for what Piaget called *conservation*. Show the child two identical glasses filled with identical amounts of water and ask which glass contains more water. The child will probably say they are the same. Now pour the contents of one glass into a third glass that is taller and thinner than the others and again ask which glass has more water. If the child still says that they are the same, this is evidence of conservation. If the child says the taller glass has more water, conservation has not yet developed—at least not for this task. The older the child, the more likely it is that conservation will appear, but some children display conservation much earlier than Piaget thought was possible.

Tony Freeman/PhotoEdit, Inc

conservation The ability to recognize that the important properties of substances or objects, such as quantity, volume, or weight, remain constant despite changes in shape, length, or position.

concrete operations According to Piaget, the third period of cognitive development, during which children can learn to count, measure, add, and subtract.

formal operations According to Piaget, the fourth period of cognitive development, characterized by the ability to engage in hypothetical thinking.

place outside of themselves as “pictures on the window,” “a circus in the room,” or “something from the sky.” And they believe that inanimate objects are alive and have intentions, feelings, and consciousness: “Clouds go slowly because they have no legs”; “Flowers grow because they want to”; and “Empty cars feel lonely.” Children in the preoperational period are also *egocentric*: they assume that their own view of the world is shared by everyone else. (This helps explain why they stand between you and the TV screen and assume you can still see it or ask “What’s this?” as they look at a picture book in the back seat of the car you’re driving.)

Children’s thinking at this period is so dominated by what they can see and touch for themselves that they do not realize something is the same if its appearance is changed. In one study, preoperational children thought that a cat wearing a dog mask was actually a dog because that’s what it looked like (DeVries, 1969). These children do not yet have what Piaget called **conservation**, the ability to recognize that important properties of a substance or a person remain the same despite changes in shape or appearance.

In a test of conservation, Piaget showed children water from each of two equal-sized glasses being poured into either a tall, thin glass or a short, wide one. They were then asked if one glass contained more water than the other. Children at the preoperational period of development said that one glass (usually the taller one) contained more. They were dominated by the evidence of their eyes. If the glass looked bigger, then they thought it contained more.

Children at this period do not understand the logic of *reversibility*—that if you just poured the water from one container to another, you can pour it back into the original container and it will be the same amount. Nor do they understand the concept of *complementarity*—that one glass is taller but narrower and the other is shorter but wider. They focus on only one dimension at a time—the most obvious or important one—and make their best guess. In fact, Piaget named this time *preoperational* because children at this stage do not yet understand logical mental *operations* such as reversibility and complementarity.

Concrete and Formal Operational Thought

At around the age of six or seven, Piaget observed, children develop conservation. When they do, they enter what he called the period of **concrete operations**. Now, he said, they can count, measure, add, and subtract. Their thinking is no longer dominated by the appearance of things. They can use simple logic and perform simple mental manipulations and mental operations on things. They can sort objects into classes (such as tools, fruit, and vehicles) or series (such as largest to smallest) by systematic searching and ordering.

Still, children in the concrete operational period can use logical operations only for real, concrete objects, such as sticks, glasses, tools, and fruit—not on abstract concepts, such as justice or freedom. They can reason only about what *is*, not about what is *possible*. The ability to think logically about abstract ideas comes in the next period of cognitive development, as children enter adolescence. This new stage is called the **formal operational** period, and it is marked by the ability to engage in hypothetical thinking, including the imagining of logical consequences. For example, adolescents who have reached this level can consider various strategies for finding a part-time job and recognize that some methods are more likely to succeed than others. They can form general concepts and understand the impact of the past on the present and the present on the future. They can question social institutions, think about the world as it might be and ought to be, and consider the consequences and complexities of love, work, politics, and religion. They can think logically and systematically about symbols and propositions.

Piaget explored adolescents’ formal operational abilities by asking them to do science experiments that involved forming and investigating hypotheses. Only about half the people in Western cultures reach the formal operational level necessary to succeed in Piaget’s experiments (Kuhn & Franklin, 2006). People who have not studied science and math at a high school level are less likely to do well in those experiments (Keating, 1990). Adults are more likely to use formal operations for problems based on their own occupations; this is one reason that people who think logically at work may still fall for a home-repair or investment scam (Cialdini, 2001).

Thinking about the Future

Once they have reached the formal operational stage, many young people become involved in politics because, for the first time, they can think about the consequences of differing approaches to government and which approach might support their emerging ideals.

David Bacon/Report Digital-Real/Redux Pictures



Modifying Piaget's Theory

Piaget's observations and demonstrations of children's cognitive development are vivid and fascinating. He was right to point out that significant shifts in children's thinking occur with age and that thinking becomes more systematic, consistent, and integrated over time. He said that children actively explore and construct knowledge, not passively receive it from the environment, and this view strongly shapes contemporary views of child development. Piaget's work also inspired experiments to test his ideas (Marti & Rodriguez, 2012). The results of these experiments suggest that Piaget's theory needs some modification.

New Views of Infants' Cognitive Development

Since Piaget's time, psychologists have used new ways to measure what is going on in infants' minds. They use infrared photography to record infants' eye movements, time-lapse photography to detect slight hand movements, and special equipment to measure infants' sucking rates. Their research shows that infants know a lot more—and know it sooner—than Piaget ever thought they did (Franchak & Adolph, 2012; Onishi & Baillargeon, 2005; Roseberry et al., 2011).

For example, it turns out that infants in the sensorimotor period are doing more than just sensing and moving; they are thinking, judging people's reliability, and developing preferences as well (e.g., Carey, 2009; Saxe, Tzelnick, & Carey, 2007; Téglás et al., 2011). And they aren't just experiencing isolated sights and sounds but combining these experiences (Vouloumanos et al., 2009). In one study, for example, infants were shown two different videotapes at the same time, while the soundtrack for only one of them came from a speaker placed between the two TV screens. The infants tended to look at the video that matched the soundtrack—for example, at a toy bouncing in sync with a tapping sound, at Dad's face when his voice was on the audio, or at an angry face when an angry voice was heard (Soken & Pick, 1992). Infants remember, too (Rovee-Collier & Cuevas, 2009). Babies as young as two to three months of age can recall a mobile that was hung over their crib a few days before (Rovee-Collier, 1999; see Figure 11.4).

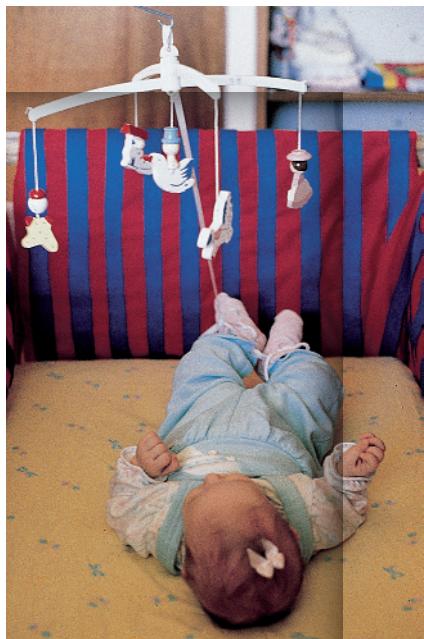


FIGURE 11.4
Infant Memory

This infant has learned to move a mobile by kicking her left foot, which is connected to the mobile by a ribbon. Even a month later, the baby will show recognition of this particular mobile by kicking more vigorously when she sees it than when she sees another one.

Busch Campus, Rutgers University

Young babies even seem to have a kind of object permanence. Piaget required infants to demonstrate object permanence by making effortful responses, such as removing a cover that had been placed over an object. Today, researchers recognize that finding a hidden object under a cover requires several abilities: mentally representing the hidden object, figuring out where it might be, and pulling off the cover. Piaget's tests did not allow for the possibility that infants know a hidden object still exists but don't yet have the skill to find it. When researchers have created situations in which infants merely have to stare to indicate that they know where an object is hidden, even infants have demonstrated this cognitive ability, especially when the object is a familiar one (Baillargeon, 2008; Bertenthal, Longo, & Kenny, 2007; Shinskey & Munakata, 2005). And when experimenters

simply turn off the lights in a room, infants as young as five months of age may reach for now-unseen objects in the dark (Clifton on et al., 1991).

Developmental psychologists generally agree that infants develop some mental representations earlier than Piaget suggested. However, they disagree about whether this knowledge is “programmed” in infants (Spelke et al., 1992), whether it develops quickly through interactions with the world (Baillargeon, 1995, 2008), or whether it is constructed by combining old schemas into new ones (Fischer & Bidell, 1991).

New Views of Developmental Periods

Contemporary researchers have also shown that changes from one developmental period to the next are less consistent and global than Piaget thought. For example, three-year-olds can sometimes make the distinction between physical and mental events; they know the characteristics of real dogs versus pretend dogs (Woolley, 1997). And they are not always egocentric (Wallace, Allan, & Tribol, 2001). In one study, children of this age knew that a white card, which looked pink to them because they were wearing rose-colored glasses, looked white to someone who was not wearing the glasses (Liben, 1978). Preoperational children can even succeed at conservation tasks if they are allowed to count the number of objects or have been trained to focus on relevant dimensions such as number, height, and width (Gelman & Baillargeon, 1983).

Taken together, these studies suggest that children’s knowledge and mental strategies develop at different ages in different areas and in “pockets” rather than at global levels of understanding (Sternberg, 1989). Knowledge in particular areas is demonstrated sooner in children who are given specific experience in those areas or who are faced with very simple questions and tasks. So children’s reasoning depends not only on their general level of development but also on (1) how easy the task is; (2) how familiar they are with the objects involved; (3) how well they understand the language being used; and (4) what experiences they have had in similar situations (Siegal, 1997). Research has also shown that the level of a child’s thinking varies from day to day and may even shift when the child solves the same problem twice in the same day (Siegler, 1994; 2006).

In summary, psychologists today tend to think of cognitive development in terms of rising and falling “waves,” not fixed periods (Siegler, 2006). It appears that children systematically try out many different solutions to problems and gradually come to select the best of them.

Information Processing During Childhood

An alternative to Piaget’s theory of cognitive development is based on the concept of information processing described in the chapters on memory and on thought and language. The **information-processing model** describes cognitive activities in terms of how people take in information, use it, and remember it. Developmental psychologists taking this approach focus on gradual quantitative changes in children’s mental capacities rather than on qualitative advances or stages in development.

LINKAGES Why does memory improve during childhood? (a link to Memory)

information processing model A view of cognitive development which focuses on the processes of taking in, remembering or forgetting, and using information.

As children get older, information-processing skills gradually get better, and they can do more complex tasks faster and more easily (Duan, Dan, & Shi, 2013; Rose, Feldman, et al., 2012). Older children have longer attention spans. They take in information and shift their attention from one task to another more rapidly. (This may be how they manage to do homework while watching TV.) They are also more efficient in processing information once it is received (Miller & Vernon, 1997). Children’s memory storage capacity also improves (Bauer & Fivush, 2013). Preschoolers can keep only two or three pieces of information in mind at the same time; older children can hold four or five. And compared with younger children, older children are better at choosing problem-solving strategies that fit the task they are facing (Schwenck, Bjorklund, & Schneider, 2009; Siegler, 2006).

We don’t yet know exactly what causes these increases in children’s attention, information processing, and memory capacities. A full explanation will undoubtedly include

both nature—specifically, maturation of the brain (Munakata, Snyder, & Chatham, 2012), and nurture—including attention training and increased familiarity with the information that is to be processed and memorized (Bryck & Fisher, 2012; Immordino-Yang, Christodoulou, & Singh, 2012). Researchers have noticed that children's cognitive abilities improve dramatically when they are dealing with familiar rather than unfamiliar material. In one experiment, Mayan children in Mexico lagged behind their age-mates in the United States on standard memory tests of pictures and nouns. But they did a lot better when researchers gave them a more familiar task, such as recalling miniature objects in a model of a Mayan village (Rogoff & Waddell, 1982).

Better memorization strategies may also help explain why children's memories improve. To a great extent, children learn these strategies in school. They learn how to memorize and how to study. They learn to place information into categories and to use other memory aids to help them remember it. After about age seven, schoolchildren are also better at remembering more complex and abstract information. Their memories are more accurate, extensive, and well organized. The knowledge they have accumulated allows them to draw more inferences and integrate new information into a more complete network of facts. (See “In Review: Milestones of Cognitive Development in Infancy and Childhood.”)

IN REVIEW

MILESTONES OF COGNITIVE DEVELOPMENT IN INFANCY AND CHILDHOOD

Age*	Achievement	Description
3–4 months	Maturation of senses	Immaturities that limit the newborn's vision and hearing are overcome.
	Voluntary movement	Reflexes disappear, and infants begin to gain voluntary control over their movements.
12–18 months	Mental representation	Infants can form images of objects and actions in their minds.
	Object permanence	Infants understand that objects exist even when out of sight.
18–24 months	Symbolic thought	Young children use symbols to represent things that are not present in their pretend play, drawing, and talk.
4 years	Intuitive thought	Children reason about events, real and imagined, by guessing rather than by engaging in logical analysis.
6–7 years	Concrete operations; Conservation	Children can apply simple logical operations to real objects. For example, in conservation they recognize that important properties of a substance, such as number or amount, remain constant despite changes in shape or position.
7–8 years	Information processing	Children can remember more information; they begin to learn strategies for memorization.

In Review Questions

1. Research in cognitive development suggests that children form mental representations _____ than Piaget thought they did.
2. Recognizing that changing the shape of clay doesn't change the amount of clay is evidence of a cognitive ability called _____.
3. The appearance of object permanence signals the end of the _____ period.

*These ages are approximate; they indicate the order in which children first reach these milestones of cognitive development rather than the exact ages.

TRY THIS

LINKAGES What happens to our memories of infancy? (a link to Memory)

DEVELOPMENT AND MEMORY**LINKAGES**

The ability to remember facts, figures, pictures, and objects improves as we get older and more expert at processing information. But take a minute right now and try to recall anything that happened to you when you were, say, one year old. Most people can accurately recall a few memories from age five or six but remember virtually nothing from before the age of three (e.g., Bauer & Larkina, 2013; Davis, Gross, & Hayne, 2008; Howe, 2013).

Psychologists have not yet found a fully satisfactory explanation for this "infantile amnesia." Some have suggested that young children lack the memory encoding and storage processes described in the chapter on memory. Yet children of two or three can clearly recall experiences that happened weeks or even months earlier (Bauer, 2006; Cleveland & Reese, 2008). Others suggest that infantile amnesia occurs because very young children lack a sense of self. Because they don't even recognize themselves in the mirror, they may not have a framework for organizing memories about what happens to them (Howe, 2003, 2011). However, this explanation would hold for only the first two years or so, because after that children do recognize their own faces and even their recorded voices (Legerstee, Anderson, & Schaffer, 1998).

Another possibility is that early memories, though "present," are implicit rather than explicit. As mentioned in the memory chapter, *implicit memories* can affect our emotions and behavior even when we do not consciously recall them. However, children's implicit memories of their early years, like the *explicit memories* that they create on purpose, are quite limited. One study found that when ten-year-old children were shown photographs of preschool classmates they hadn't seen in five years, the children had little implicit or explicit memory of them (Newcombe & Fox, 1994). But, adults correctly identify 90 percent of photographs of high-school classmates they have not seen for thirty years (Bahrick, Bahrick, & Wittlinger, 1975).

Other explanations of infantile amnesia suggest that our early memories are lost because in early childhood we don't yet have language skills to talk about—and thus solidify—memories. This possibility was explored in a study in which two- to three-year-old children played with a machine that supposedly could shrink toys (Simcock & Hayne, 2002). Six months later, they were asked what they remembered about this event. If they had not yet developed language at the time they played with the machine, the children could say little or nothing about the experience when asked about it later. However, most of these same children could correctly identify pictures of the machine and act out what they had done with it. It appears that they had memories of the event that could be recalled nonverbally but not in words (Richardson & Hayne, 2007). Another idea is that early experiences tend to be fused into *generalized event representations*, such as "going to Grandma's" or "playing at the beach," so it becomes difficult to recall specific events.

Some researchers believe that adults have difficulty accessing early memories because when they were very young children they lacked the emotional knowledge necessary for interpreting, representing, organizing, and retrieving information about the events they experienced (Wang, 2008). Still other researchers believe that infantile amnesia is due partly to the ways that people are asked about their early memories and that specialized questioning techniques might allow retrieval of early memories that are normally unavailable (Jack & Hayne, 2007; Wang & Peterson, 2014).

Research on hypotheses such as these may someday unravel the mystery of infantile amnesia.

Culture and Cognitive Development

To explain cognitive development, Piaget focused on the physical world of objects. Russian psychologist Lev Vygotsky (pronounced "vah-GOT-skee") focused on the social world of people. He viewed cognitive abilities as due to cultural history. The child's mind, said Vygotsky, grows by contact with other minds. It is through interaction with parents, teachers, and other representatives of their culture that children learn the ideas of that culture (Vygotsky, 1991).

Vygotsky's followers have studied the effects of the social world on children's cognitive development—especially how participation in social routines affects children's developing knowledge of the world (Gauvain, Beebe, & Zhao, 2011). In Western societies, those routines include shopping, eating at McDonald's, going to birthday parties, and attending religious services. In other cultures they might include helping to make pottery, going hunting, and weaving baskets (Larson & Verma, 1999). Quite early, children develop mental representations, called *scripts*, for these activities (see the chapter on thought and language). By the time they are three, children can describe routine activities quite accurately (Nelson, 1986). Scripts, in turn, affect children's knowledge and understanding of cognitive tasks (Saxe, 2004). For example, in cultures in which pottery making is important, children display conservation about the mass of objects sooner than children do in other cultures (Gardiner & Kosmitzki, 2005).

Children's cognitive abilities are also influenced by the language of their culture. Korean and Chinese children, for instance, show exceptional ability at adding and subtracting large numbers (Miller et al., 1995). As third-graders, they do three-digit problems in their heads (such as 702 minus 125) that peers in the United States would labor to solve. The difference may stem in part from the clear and explicit words that Asian languages use for the numbers from eleven to nineteen. In English, the meaning of the words *eleven* and *twelve*, for instance, is not as clear as the Asian *ten-one* and *ten-two*. Moreover, Asians use the abacus and a metric system of measurement, both of which center around the number ten. Korean math textbooks emphasize this tens structure by presenting ones digits in red, tens in blue, and hundreds in green. Above all, for children in Asian cultures, educational achievement, especially in mathematics, is strongly encouraged (Naito & Miura, 2001). In short, children's cognitive development is affected in ways large and small by the culture they live in (Broesch et al., 2011; Gauvain et al., 2011).

Individual Variations in Cognitive Development

Even within a single culture, some children are mentally advanced, whereas others lag behind their peers. Why? As already suggested, heredity is an important factor, but experience also plays a role. To explore how significant that role is, psychologists have studied the cognitive development of children raised in many different environments.

Cognitive development is seriously delayed if children are raised in environments where they are deprived of the everyday sights, sounds, and feelings provided by pictures

Babies at Risk

The cognitive development of infants raised in this understaffed Russian orphanage will be permanently impaired if they are not given far more stimulation in the orphanage or, better yet, are adopted into a loving family before they're six months of age (Becket et al., 2006; Krepner et al., 2007). It's likely that they'll suffer from reduced brain metabolism and reduced activity in regions associated with higher cognitive functions, memory, and emotion (McLaughlin et al., 2011; Nelson, 2007).

Josef Polleross/The Image Works



and books, by conversation and loving interaction with family members, and even by television, radio, and the Internet. Children subjected to this kind of severe deprivation show significant impairment in intellectual development by the time they are two or three years old. "Genie" was one such child. When rescued at age fourteen, she weighed only fifty-nine pounds. The only things she could say were "stop it" and "no more." Investigators discovered that she had spent her life confined to a small bedroom, harnessed to a potty chair during the day and caged in a crib at night. She had not been permitted to hear or make many sounds. Although scientists and therapists worked intensively with Genie in the years after her rescue, she never learned to speak in complete sentences, and she remains in an adult care facility (James, 2008).

Cognitive development may also be impaired by less extreme conditions of deprivation, including the neglect, malnourishment, noise, and chaos that occur in some homes. One study of the effects of poverty found that by the time they were five years old, children raised in poverty scored nine points lower on IQ tests than did children in families whose incomes were at twice the poverty level—even after the researchers had controlled for other variables, such as family structure and parents' education (Duncan, Brooks-Gunn, & Klebanov, 1994; Marcus Jenkins et al., 2013). These differences continue as poor children enter school (Cushon et al., 2011). Children who remain in poverty have lower IQs and poorer school achievement (Duncan, Morris, & Rodrigues, 2011; Siegler, 2003). They also have more learning disabilities (Bigelow, 2006), are less engaged in school (Teachman, 2008), and score lower on neurocognitive tests (Farah et al., 2006). One study of more than 10,000 children found that the economic status of the family into which a child is born is a much better predictor of the child's cognitive development than are physical risk factors such as low birth weight (Jefferis, Power, & Hertzman, 2002). It is no wonder then that lower average IQs are seen in countries where higher numbers of children are living in poverty (Weiss, 2007).

When Does Stimulation Become Overstimulation?

A child's cognitive development is enhanced by a stimulating environment, but can there be too much stimulation? In the face of an avalanche of electronic media aimed specifically at babies and toddlers, some people are beginning to wonder (Zimmerman & Christakis, 2007; Zimmerman, Christakis, & Neltzoff, 2007). These stimulating media include computer "lapware," such as this baby is enjoying, videos and DVDs for even the tiniest infants, and, of course, television programs such as *Teletubbies*. We don't yet know how all this well-intentioned electronic stimulation is affecting young children, but there is some evidence that passively watching videos may not promote learning in infants and toddlers (DeLoache et al., 2010), and the American Academy of Pediatrics (2011) recommends that children under the age of two should remain "screen free" because they don't yet understand what they're seeing.

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In families with incomes above the poverty line, children's cognitive development is still related to their surroundings and experiences. Parents often make the difference between a child getting A's or C's. To help children achieve those A's, adults can expose them from the early years to a variety of interesting materials and experiences—though not too many to be overwhelming (Cook, Goodman, & Schulz, 2011; van Schijndel et al., 2010). Children's cognitive development is enhanced when parents read and talk to them, encourage and help them explore, and actively teach them (Gottfried, 1997; Raikes et al., 2006)—in short, when they provide both support and challenge for

a child's talents (Yeung, Linver, & Brooks-Gunn, 2002). Children benefit as well from early access to a computer (Fish et al., 2008). In one study, third-graders who had a computer but not a TV in their bedroom scored 10 to 20 points higher on tests of math, reading, and language than children who had a TV but no computer (Borzekowski & Robinson, 2005).

To improve the cognitive skills of children who do not get these kinds of stimulation, developmental psychologists have provided some children with extra lessons, educational materials, and contact with caring adults (e.g., van der Kooy-Hofland et al., 2012). In the United States, the most comprehensive effort of this sort is Project Head Start, a federally funded preschool program for poor children. Many smaller, more intensive programs are offered by state and local agencies. Such programs do enhance children's cognitive abilities (Tucker-Drob, 2012; Welsh et al., 2010), and some effects can last into adulthood (Campbell et al., 2012). Music lessons can also promote children's cognitive development, especially verbal memory (Ho, Cheung, & Chan, 2003; Moreno et al., 2011). Internet access, too, has been related to improved reading scores and school grades among poor children (Jackson et al., 2011). Even electronic games, although they are no substitute for adult attention, can provide opportunities for school-age children to hone spatial skills (Blumberg et al., 2013). There are limits, however. An excess of computer gaming has been associated with reduced academic achievement as well as with some physical and behavioral problems (Desai et al., 2010; Weis & Cerankosky, 2010).

INFANCY AND CHILDHOOD: SOCIAL AND EMOTIONAL DEVELOPMENT

How do infants become attached to their caregivers?

Life for the child is more than learning about objects, doing math problems, and getting good grades. It is also about social relationships and emotional reactions. From the first months onward, infants are sensitive to those around them (Geangu et al., 2010; Mumme & Fernald, 2003), and they are both attracted by and attractive to other people—especially parents and other caregivers.

During the first hour or so after birth, mothers gaze into their infants' eyes and give them gentle touches (Klaus & Kennell, 1976). This is the first chance for the mother to show her *bond* to her infant—an emotional tie that begins even before the baby is born (Feldman et al., 2007). Psychologists once believed that this immediate contact was critical—that the mother-infant bond would never be strong if the opportunity for early interaction was missed. Research has revealed, however, that although skin-to-skin contact with the infant immediately after birth increases the mother's positive behavior with the infant and the length of time she breastfeeds (e.g., Bigelow et al., 2010, 2013; Moore et al., 2012), such interaction is not a requirement for a close relationship (Myers, 1987).

Mothers and fathers, whether biological or adoptive, gradually form close attachments to their infants by interacting with them day after day.

As the mother gazes at her baby, the baby gazes back. By the time infants are two days old, they recognize—and like—their mother's face. They will suck more vigorously in order to see an image of her face than to see a stranger's (Walton, Bower, & Bower, 1992). Soon, they begin to respond to the mother's facial expressions as well. By the time they are a year old, children use their mothers' emotional expressions to guide their own behavior in uncertain situations (Hertenstein & Campos, 2004; Saarni, 2006). As mentioned in the chapter on motivation and emotion, this phenomenon is called *social referencing*. If the mother looks frightened when a stranger approaches, for example, the child is more likely to avoid the stranger. Research on infants' brain activity suggests that they

Forming a Bond

Mutual eye contact, exaggerated facial expressions, and shared "baby talk" are an important part of the early social interactions that promote an enduring bond of attachment between parent and child.

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pay particular attention to signs of fear and other negative emotions in adults (Leppänen & Nelson, 2012). This tendency may explain why, as described in the chapter on learning, observation of other people's reactions can sometimes lead to the development of fears and even phobias.

Infants communicate feelings as well as recognize them. Before they can speak, infants use gestures to show their caregivers that they are feeling happy, mad, sad, scared, sleepy, or cold (Vallotton, 2008).

Individual Temperament

From the moment infants are born, they differ from each other. Some are happy, active, and vigorous; they splash, thrash, and wriggle. Others lie still most of the time. Some infants eagerly approach new objects; others turn away or fuss. Some infants whimper; others kick, scream, and wail. Characteristics such as these make up an infant's temperament. **Temperament** refers to the infant's individual style and frequency of expressing needs and emotions; it is constitutional, biological, and genetically based. Although temperament mainly reflects nature's effect on the beginning of an individual's personality, it can also be affected by prenatal environment, including—as noted earlier—a mother's smoking, drug use, and stress during pregnancy (Blair et al., 2011; Davis et al., 2011; Sandman et al., 2011, 2012). Maternal stress after birth also affects a baby's temperament. For example, breastfed infants who ingest more of the stress-related hormone cortisol tend to have more fearful temperaments (Glynn et al., 2007). And if mothers of babies with negative temperaments continue to experience stress, the babies tend to express even more negative emotion during the next five years (Pesonen et al., 2008).

Babies seem to fall into one of three main temperament patterns (Thomas & Chess, 1977). Most common are *easy babies*, who get hungry and sleepy at predictable times, react to new situations cheerfully, and seldom fuss. *Difficult babies* are irregular and irritable. The third group, *slow-to-warm-up babies*, react warily to new situations but eventually enjoy them.

Traces of early temperamental characteristics weave their way from birth throughout childhood and into adulthood. Easy infants usually stay easy (Zhou et al., 2004) and tend not to develop conduct problems (Lahey et al., 2008); difficult infants often remain difficult, sometimes developing attention and aggression problems in childhood (Else-Quest et al., 2006; Miner & Clarke-Stewart, 2008). Timid toddlers tend to become shy preschoolers, restrained and inhibited eight-year-olds, somewhat anxious teenagers, and shy and cautious young adults (Caspi, Harrington et al., 2003; Rothbart, 2011). These individuals tend to marry at a later age than their more outgoing peers (Caspi, Elder, & Bem, 1988). However, in temperament, as in cognitive development, nature interacts with nurture (Jaffari-Bimmel et al., 2006; Kiff, Lengua, & Zalewski, 2011). Events and influences that occur between infancy and adulthood can help to stabilize an individual's temperament or shift its development in one direction or the other.

One source of influence may be the degree to which an infant's temperament matches the parents' personal styles and what they want and expect from their baby. When the match is a good one, parents tend to support and encourage the infant's behavior, thus increasing the chances that temperamental qualities will be stable. Consider the temperament patterns of Chinese American and European American children. At birth, Chinese American infants are calmer, less changeable, less excitable, and more easily comforted when upset than European American infants (Kagan et al., 1994). This tendency toward self-control is reinforced by Chinese culture. Compared with European American parents, Chinese parents are less likely to reward and stimulate infants' babbling and smiling and more likely to maintain close control of their young children. The children, in turn, are more dependent on their mothers and less likely to play by themselves. They are less vocal, noisy, and active than European American children (Smith & Freedman, 1983), and as preschoolers they show far more impulse control, including the ability to wait their turn (Sabbagh et al., 2006).

temperament An individual's basic, natural disposition that is evident from infancy.



FIGURE 11.5
Wire and Terry Cloth “Mothers”

These are the two types of artificial mothers used in Harlow’s research. Although baby monkeys received milk from the wire mother, they spent most of their time with the terry cloth version, and they clung to it when frightened.

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Temperamental differences between children in different ethnic groups show the combined contributions of nature and nurture. Mayan infants, for example, are relatively inactive from birth. The Zinacantecos, a Mayan group in southern Mexico, reinforce this innate predisposition toward restrained motor activity by tightly wrapping infants and by nursing at the slightest sign of movement (Greenfield & Childs, 1991). This combination of genetic predisposition and cultural reinforcement is adaptive. Quiet infants do not kick off their covers at night, which is important in the cold highlands where they live. Inactive infants are able to spend long periods on their mothers’ backs as the mothers work. And infants who do not walk until they understand some language do not wander into the open fire at the center of the house. This adaptive interplay of innate and cultural factors in temperament operates in all cultures.

Nature and nurture combine to influence individual differences within cultures, too. Many studies show that children are more likely to show aggressiveness, anxiety, depression, or academic and social problems if they suffer the “double whammy” of starting life with a difficult temperament and then grow up in a harsh, insensitive, unsupportive, or anxiety-provoking family environment (e.g., Bates, Schermerhorn, & Petersen, 2012; Crawford, Schrock, & Woodruff-Borden, 2011; Engle & McElwain, 2011). For example, children who had both timid temperaments and mothers who were unsupportive, negative, or depressed were more likely to remain fearful, to be socially withdrawn, to have more negative moods, and to have difficulty controlling negative emotions (Hane et al., 2008; Lewis-Morrarty et al., 2012). However, if a difficult or shy baby is lucky enough to have patient parents who allow their baby to respond to new situations and changes in daily routines at a more relaxed pace, the baby is likely to become less difficult or shy over time. Children are least likely to have problems if they have an easy temperament and their parents do not display harshness and psychological problems (Derauf et al., 2011).

The Infant Grows Attached

As infants and caregivers respond to one another in the first year, the infant begins to form an **attachment**—a deep, affectionate, close, and enduring relationship—to these important figures. **Attachment theory** was first developed by John Bowlby, a British psychoanalyst who drew attention to the importance of attachment after he observed children who had been orphaned in World War II. These children’s depression and other emotional scars led Bowlby to propose a theory about the importance of developing a strong attachment to one’s primary caregivers—a tie that normally keeps infants close to those caregivers and, therefore, safe (Bowlby, 1973). Soon after Bowlby first described his theory, researchers in the United States began to investigate how such attachments are formed and what happens when they fail to form or are broken by loss or separation. The most dramatic of these studies was conducted with monkeys by psychologist Harry Harlow.

Motherless Monkeys—and Children

Harlow (1959) separated newborn monkeys from their mothers and raised them in cages containing two artificial mothers. One “mother” was made of wire with a rubber nipple from which the infant could get milk (see Figure 11.5). It provided food but no physical comfort. The other artificial mother had no nipple but was made of soft, comfortable terry cloth. If attachments form entirely because caregivers provide food, the infants would be expected to prefer the wire mother. In fact, they spent most of their time with the terry cloth mother. And when they were frightened, the infants immediately ran to their terry cloth mother and clung to it. Harlow concluded that the monkeys were motivated by the need for comfort. The terry cloth mother provided feelings of softness and cuddling, which were things the infants needed when they sensed danger.

Harlow also investigated what happens when attachments do not form. He isolated some monkeys from all social contact from birth. After a year of this isolation, the monkeys showed dramatic disturbances. When visited by normally active, playful monkeys, they withdrew to a corner, huddling or rocking. These monkeys’ problems

attachment A deep, affectionate, close, and enduring relationship with a person with whom a baby has shared many experiences.

attachment theory The idea that children form a close attachment to their earliest caregivers and that this attachment pattern can affect aspects of the children’s later lives.

continued into adulthood. As adults, they were unable to have normal sexual relations. When some of the females became pregnant through artificial means, their maternal behaviors were woefully inadequate. In most cases, these mothers ignored their infants. When the infants became distressed, the mothers physically abused and sometimes even killed them.

Humans who spend their first few years without a consistent caregiver react in a similar manner. Like Harlow's deprived monkeys, children raised in orphanages staffed by neglectful caregivers tend not to develop attachments to those caregivers, become withdrawn and constantly rocking (Holden, 1996; Zeanah et al., 2005, 2009). In one study, researchers observed the behavior of four-year-old children who had been in a poorly staffed orphanage for at least eight months before being adopted (Chisholm, 1997). Compared with children who had been adopted before they were four months old, the late-adopted children were found to have many more serious problems. Depressed or withdrawn, they stared blankly, demanded attention, and could not control their tempers. Although they interacted poorly with their adoptive mothers, they were friendly with strangers, usually trying to cuddle and kiss them. At age six, a third of late-adopted children still showed no preference for their parents or any tendency to look to them when stressed (Rutter, O'Connor, & ERA Study Team, 2004). Other studies have found that children who spent their first year in such orphanages displayed antisocial behavior and other long-term social and behavioral problems (Hawk & McCall, 2011). Neuroscientists suggest that the problems seen in isolated primates—as well as in humans—are the result of developmental brain dysfunction and damage brought on by a lack of touch and body movement in infancy, and by the absence of early play, conversation, and other social experiences in childhood (Kalcher-Sommersguter et al., 2011; Wiik et al., 2011; Wismer, Fries et al., 2005, 2008). These problems are less likely if orphanage caregivers receive social-emotional training (McCall et al., 2013).

Forming an Attachment

Fortunately, most infants do have a consistent caregiver, usually the mother, to whom they form an attachment. They quickly learn to recognize her and distinguish her from a stranger. Even at three months, some infants vocalize more to their mothers than to a stranger. By six or seven months, infants prefer the mother to anyone else. They crawl after her, call out to her, hug her, climb into her lap, protest when she leaves, and brighten when she returns (Ainsworth & Marvin, 1995). After an attachment has formed, separation from the mother for even thirty minutes can be a stressful experience (Cassidy, 2008). Babies who recognize and prefer their mothers even earlier—at three months—may be especially bright: they tend to get better grades in school and complete more years of education (Roe, 2001).

Infants also develop attachments to fathers, but usually a little later (Arsalidou et al., 2010; Lamb, 1997). Father-infant interaction is also less frequent than mother-infant interaction, and most studies show that it has a somewhat different nature (Lamb & Lewis, 2010). Mothers tend to feed, bathe, dress, cuddle, and talk to their infants, whereas fathers are more likely to play with, jiggle, and toss them, especially sons.

Variations in Attachment

How much closeness and contact an infant seeks with a parent depends to some extent on the infant. Babies who are ill, tired, or slow to warm may need more closeness. Closeness also depends in part on the parent. An infant whose parent has been absent or unresponsive may need more closeness than one whose parent is accessible and responsive.

Researchers have studied the differences in infants' **attachment behavior** in a special situation that simulates the natural comings and goings of parents and infants—the so-called *Strange Situation* (Ainsworth et al., 1978). Testing occurs in an unfamiliar playroom where the infant interacts with the mother and an unfamiliar woman in brief episodes: the infant plays with the mother and the stranger, the mother leaves the baby with the stranger

attachment behavior Actions such as crying, smiling, vocalizing, and gesturing that help bring an infant into closer proximity to its caretaker.

for a few minutes, the mother and the stranger leave the baby alone in the room briefly, and the mother returns.

These sessions show that most infants display a *secure attachment* to their mothers (Thompson, 2006). In the unfamiliar room, the infant uses the mother as a home base, leaving her side to explore or play but returning periodically for comfort or contact. Securely attached children tolerate brief separation from mothers, but are happy to see them return, and receptive to the mothers' offers of contact. These mother-child pairs tend to interact well from early in life, and the mothers tend to be sensitive and responsive (DeWolff & van IJzendoorn, 1997).

Some infants, however, form *insecure attachments*. If the relationship is *avoidant*, infants avoid or ignore the mother when she approaches or returns after a brief separation. If the relationship is *ambivalent*, the infant is upset when the mother leaves, but when she returns the child acts angry and rejects the mother's efforts at contact; when picked up, the child squirms to get down. If the relationship is *disorganized*, the infant's behavior is inconsistent, disturbed, and disturbing; the child may begin to cry again after the mother has returned and provided comfort or may reach out for the mother while looking away from her (Moss et al., 2004).

Patterns of child care and attachment vary widely in different parts of the world (Rothbaum, Morelli, & Rusk, 2010). In northern Germany, for example, where parents are quite strict, the proportion of infants who display avoidant attachments is much higher than in the United States (Grossman et al., 2008; Spangler, Fremmer-Bombik, & Grossman, 1996). It used to be common for kibbutz babies in Israel to sleep in infant houses away from their parents, but they were found to be more likely to show insecure attachments and other related problems (Aviezer et al., 1999). The practice is unusual now. In Japan, where mothers are expected to be completely devoted to their children and are seldom apart from them, even at night, children develop an attachment relationship that emphasizes harmony and union (Rothbaum, Pott, et al., 2000). These attachment patterns differ from the secure type that is most common in the United States: with their parents' encouragement, U.S. children balance closeness and proximity with exploration and autonomy.

In all countries, the likelihood that children will develop a secure attachment depends on the mother's attentiveness; if the mother is sensitive and responsive to the baby's needs and signals, a secure attachment is more likely; if she is rejecting or neglecting, the child's attachment is more likely to be insecure (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2008; Nievar & Becker, 2008).

Consequences of Attachment Patterns

The nature of a child's attachment to caregivers can have long-term and far-reaching effects). For example, an infant's secure attachment continues into young adulthood—and probably throughout life—unless it is disrupted by the loss of a parent, abuse by a family member, chronic depression in the mother, or certain other severe negative events (e.g., Mattanah, Hancock, & Brand, 2004; Weinfeld, Sroufe, & Egeland, 2000). A secure attachment to the mother is also reflected in relationships with other people. Children who are securely attached receive more positive reactions from other children as toddlers (Fagot, 1997) and have better relations with peers in middle childhood and adolescence (Dykas & Cassidy, 2011; Lucas-Thompson & Clarke-Stewart, 2007; McElwain, Booth-LaForce, & Wu, 2011). Securely attached children also require less contact, guidance, and discipline from teachers, and are less likely to seek excessive attention, to act impulsively or aggressively, to express frustration, to become distracted, or to display helplessness or anxiety (see the chapter on learning; Davies et al., 2013; Fearon et al., 2010; Groh et al., 2012; Kochanska & Kim, 2013). Their teachers like them more, expect more of them, and rate them as more competent (Diener et al., 2008). Children who do not form secure attachments, in contrast, risk developing anxiety and depression (Kerns & Brumariu, 2013) and are more likely to behave aggressively and violently later in life (Ogilvie et al., 2014; Savage, 2014).

Why should this be? According to Bowlby, securely attached children develop positive relationships with other people because they develop mental representations, or *internal working models*, of the social world that lead them to expect that everyone else will respond to them in the same positive ways as their parents do. But secure attachment at the age of one doesn't guarantee a life of social competence and emotional well-being. In one study, researchers found that attachment security was stable from infancy to adolescence only for children whose mothers were supportive and sensitive at both age periods (Beijersbergen et al., 2012). If parents become neglectful or rejecting as the result of marital strife, divorce, or depression, for example, the secure attachments are likely to disintegrate, and the child may begin to have problems (Thompson, 2006). So although a secure attachment alone does not predict long-term sociability and well-being, in concert with continuing supportive care, it sets the stage for positive psychological growth.

THINKING CRITICALLY

DOES DAY CARE HARM THE EMOTIONAL DEVELOPMENT OF INFANTS?

With about 65 percent of U.S. mothers working outside of the home (U.S. Department of Labor, 2012), how does such daily separation affect their children, especially infants (Clarke-Stewart & Allhusen, 2005)? Some argue that putting infants in day care with a nanny or child care center damages the quality of mother-child relations and increases the child's risk for psychological problems (Gallagher, 1998). Other researchers question whether day care alone causes such problems (Stein et al., 2013; Zachrisson et al., 2013).

What am I being asked to believe or accept?

The claim is that daily separations created by day care damage the formation of an attachment between the mother and infant and harm the infant's emotional development.

What evidence is available to support the assertion?

There is clear evidence that separation from the mother is painful for young children. If separation lasts a week or more, children who have formed an attachment to their mother tend to protest, then become apathetic and mournful (Robertson & Robertson, 1971). But day care does not involve such lasting separations. Research has shown that infants who are in day care do form attachments to their mothers. In fact, they prefer their mothers to their daytime caregivers (Lamb & Ahnert, 2006).

Are these attachments as secure as the attachments formed by infants whose mothers do not work outside the home? An answer may be suggested by comparing how infants react to brief separations from mothers in the Strange Situation. A review of about twenty such studies revealed that infants in full-time day care were somewhat more likely to be classified as insecurely attached. About 36 percent of them were classified as insecure; only 29 percent of the infants who were not in full-time day care were counted as insecure (Clarke-Stewart, 1989). These results might suggest that day care could harm infants' attachments to mothers.

Are there alternative ways of interpreting the evidence?

Perhaps factors other than day care could explain the difference between infants in day care and those at home with their mothers. One such factor could be the method that was used to assess attachment. Infants in these studies were judged insecure if they did not run to their mothers after a brief separation in the Strange Situation. But maybe infants who experience daily separations from their mothers during day care feel more comfortable in the Strange Situation and therefore seek out less closeness with their mothers. A second factor concerns the possible differences between the infants' mothers. Perhaps mothers who value independence in themselves and in their children are more likely to be working and to place their children in day care, whereas mothers who emphasize closeness with their children are more likely to stay home.

(continued)

What additional evidence would help evaluate the alternatives?

Finding insecure attachment to be more common among the infants of working mothers does not, by itself, demonstrate that day care is harmful. To judge the effects of day care, we must consider other measures of emotional adjustment as well. If infants in day care showed consistent signs of impaired emotional relations in other situations (at home, for example) and with other caregivers (such as the father), this evidence would support the argument that day care harms children's emotional development. We should also statistically control for differences in the behavior and attitudes of parents who do and do not put their infants in day care and then look for differences in their children.

In fact, this research design has already been employed. In 1990, the U.S. government started funding for a study of infant day care in ten sites around the country. The psychological and physical development of more than 1,300 randomly selected infants was tracked from birth through age three. The results have shown that when factors such as parents' education, income, and attitudes were statistically controlled, infants in day care were no more likely to have emotional problems or to be insecurely attached to their mothers than infants not in day care. However, in cases in which infants were in poor-quality day care with insensitive, unresponsive caregivers, and in which mothers were insensitive to their babies' needs at home, the infants were less likely to develop a secure attachment to their mothers (Belsky et al., 2007; NICHD Early Child Care Research Network, 2005, 2006a). A 2011 follow-up on the children in this study found that the ones who experienced both poor care at home and in day care also had the most behavior problems as preschoolers (Watamura et al., 2011).

What conclusions are most reasonable?

Based on available evidence, the most reasonable conclusion appears to be that day care by itself does not lead to insecure attachment. But if that day care is of poor quality, it can worsen a risky situation at home and increase the likelihood that infants will have problems forming a secure attachment to their mothers.

Relationships with Parents and Peers

Erik Erikson (1968) described the first year of life as a time when infants develop a feeling of trust (or mistrust) about the world. According to his theory, an infant's first year represents the first of eight stages of lifelong psychosocial development (see Table 11.2). Each stage focuses on an issue, or "crisis," that is especially important at that time of life. Erikson believed that the ways that people resolve these crises shape their personalities and social relationships. Resolving a crisis in a positive way provides the foundation for characteristics such as trust, independence, initiative, or industry. But if the crisis is not resolved positively, according to Erikson, the person will be psychologically troubled and cope less effectively with later crises. In Erikson's theory, trusting caregivers during infancy forms the bedrock for all future social and emotional development.

The Effects of Day Care

Parents are understandably concerned that leaving their infants in a day-care center might interfere with the mother-infant attachment or other aspects of their children's development. Research shows that most infants in day care do form healthy bonds with their parents but that if children spend many hours in day care between infancy and kindergarten, they are more likely to have behavior problems in school, such as talking back to the teacher or getting into fights (NICHD Early Child Care Research Network, 2001, 2006b). Some employers try to help parents build attachments with their infants by providing on-site day care or letting employees keep their babies with them while working (Armour, 2008).

Bob Mahoney/The Image Works



TABLE 11.2 ERIKSON'S STAGES OF PSYCHOSOCIAL DEVELOPMENT

In each of Erikson's stages of development, a different psychological issue presents a new crisis for the person to resolve. The person focuses attention on that issue and by the end of the period has worked through the crisis and resolved it either positively, in the direction of healthy development, or negatively, hindering further psychological development.

Age	Central Psychological Issue or Crisis
First Year	Trust versus mistrust Infants learn to trust that their needs will be met by the world, especially by the mother—or they learn to mistrust the world.
Second year	Autonomy versus shame and doubt Children learn to exercise will, make choices, and control themselves—or they become uncertain and doubt that they can do things by themselves.
Third to fifth year	Initiative versus guilt Children learn to initiate activities and enjoy their accomplishments, acquiring direction and purpose—or, if they are not allowed initiative, they feel guilty for their attempts at becoming independent.
Sixth year through puberty	Industry versus inferiority Children develop a sense of industry and curiosity and are eager to learn—or they feel inferior and lose interest in the tasks before them.
Adolescence	Identity versus role confusion Adolescents come to see themselves as unique and integrated persons with an ideology—or they become confused about what they want out of life.
Early adulthood	Intimacy versus isolation Young people become able to commit themselves to another person—or they develop a sense of isolation and feel they have no one in the world but themselves.
Middle age	Generativity versus stagnation Adults are willing to have and care for children and to devote themselves to their work and the common good—or they become self-centered and inactive.
Old age	Integrity versus despair Older people enter a period of reflection, becoming assured that their lives have been meaningful and becoming ready to face death with acceptance and dignity—or they are in despair about their unaccomplished goals, failures, and ill-spent lives.

After children form strong emotional attachments to their parents, their next psychological task is to develop a more independent relationship with them. In Erikson's theory, this task is reflected in the second stage (again, see Table 11.2). Children begin to exercise their wills, to be more independent from parents, and begin activities on their own. According to Erikson, children who are not allowed to exercise their wills or start their own activities will feel uncertain about doing things for themselves and guilty about seeking independence. The extent to which parents allow or encourage their children's independence is related to their parenting style.

Parenting Styles

Most parents try to channel children's impulses into socially accepted outlets and teach them the skills and rules needed to function in their culture. This process is called **socialization**.

socialization The process by which parents, teachers, and others teach children the skills and social norms necessary to be well-functioning members of society.

European American parents tend to use one of four **parenting styles** (Baumrind, 1991; Maccoby & Martin, 1983). **Authoritarian parents** tend to be strict, punishing, and unsympathetic. They value obedience from children and try to curb the children's wills and shape their children's behavior to meet a set standard. They do not encourage independence. They are detached and seldom praise their kids. In contrast, **permissive parents** give children complete freedom with little discipline. **Authoritative parents** fall between these two extremes. They reason with their children, encouraging give and take. They allow children increasing responsibility as they get better at making decisions. They are firm but understanding. They set limits but also encourage independence. Their demands are reasonable, rational, and consistent. **Uninvolved parents** (also known as **rejecting-neglecting parents**) are indifferent to their children. They invest as little time, money, and effort in their children as possible, focusing on their own needs before their children's. These parents often fail to monitor their children's activities, particularly when the children are old enough to be out of the house alone.

Research shows that these parenting styles are consistently related to young children's social and emotional development (e.g., Eisenberg, Fabes, & Spinrad, 2006; Erath et al., 2011; Parke & Buriel, 2006). Authoritarian parents tend to have children who are unfriendly, distrustful, and withdrawn. These children have more behavioral problems, show less remorse or acceptance of blame after doing something wrong, and more often cheat in school (Eisenberg, Fabes, & Spinrad, 2006; Paulussen-Hoogeboom et al., 2008). Children of permissive parents tend to be immature, dependent, and unhappy; they are likely to have tantrums or to ask for help when they encounter even slight difficulties. Children raised by authoritative parents tend to do best. They are more often friendly, cooperative, self-reliant, and socially responsible (Ginsburg et al., 2009). They do better in school, enjoy greater popularity, and show better psychological adjustment in the event of parental divorce (Hinshaw et al., 1997; Steinberg et al., 1994).

The results of all these parenting studies are limited in several ways. First, they are based on correlations, which, as discussed in the chapter on research in psychology, do not prove causation. Finding consistent correlations between parents' and children's behavior does not establish that the parents are *causing* the differences seen in their children. Socialization is a two-way street: Parents' behavior is shaped by their children, too. Children's temperament, size, and appearance may influence how parents treat them (Ganiban et al., 2011; Lipscomb et al., 2011). Some developmental psychologists even suggest that it is not the parents' socialization practices that influence children but rather how the children perceive discipline—as stricter or more lenient than what an older sibling received, for example (Reiss et al., 2000).

parenting styles The varying patterns of behavior—ranging from permissive to authoritarian—that parents display as they interact with and discipline their children.

authoritarian parents Parents who are firm, punitive, and unsympathetic.

permissive parents Parents who give their children complete freedom and lax discipline.

authoritative parents Parents who reason with their children and are firm but understanding.

uninvolved parents (rejecting-neglecting parents) Parents who invest as little time, money, and effort in their children as possible.

A second limitation of parenting studies is that the correlations between parenting styles and children's behavior, though statistically significant, are usually not terribly large (Ho, Bluestein, & Jenkins, 2008) and therefore do not apply to every child in every family. In fact, research shows that the effects of parents' socialization can differ depending on their children's temperament. The gentle parental guidance that has a noticeable effect on a child with a fearful temperament might have far less impact on a child whose temperament is less fearful (Kochanska, Aksan, & Joy, 2007). Similarly, harsh authoritarian parenting seems to disrupt emotion regulation and the development of conscience in children who are temperamentally fearful (Feng et al., 2008; Schwartz & Bugental, 2004).

Parenting Styles and Culture

Yet another limitation of parenting studies is that most of them were conducted with European American families. Is the impact of various parenting styles different in other ethnic groups and other cultures? Possibly. Parents in Latino cultures in Mexico, Puerto Rico, and Central America and in Asian cultures in China and India, for example, tend to be influenced by a collectivist tradition in which family and community interests are emphasized over individual goals. Children in these cultures are expected to respect and obey their elders and to do less of the questioning, negotiating, and arguing that is encouraged—or at least allowed—in many middle-class European and European American families (Greenfield, Suzuki, & Rothstein-Fisch, 2006; Parke & Buriel, 2006). When parents from these cultures immigrate to the United States, they bring their authoritarian



Parent-Training Programs

Parenting styles are determined by many factors, including genetics (Klahr & Burt, 2014), and research on how different styles affect children's behavior has helped shape parent-training programs based on the learning principles described in the chapter on learning and on the social-cognitive and humanistic approaches described in the chapter on personality. These programs are designed to teach parents authoritative methods that can avoid scenes like this.

Ulrich Baumgarten/Getty Images

parenting style with them. There is evidence, though, that the authoritarian discipline often seen in Asian American, Hispanic American, and African American families does not have the same negative consequences for young children's behavior as it does in European American families (Chao & Tseng, 2002; Slade & Wissow, 2004). For example, Chinese children tend to believe that their mothers (and teachers) are motivated to teach them to behave well rather than to control them and so they feel more positive than European American children do about authoritarian disciplinary techniques such as shaming, imparting guilt, and withdrawing love (Helwig et al., 2013; Zhou, Lam, & Chan, 2012). By contrast, European American parents are more likely to use authoritarian discipline to keep children in line and break their wills. In countries such as India and Kenya, where physical punishment tends to be an accepted form of discipline, punishment is associated with less aggression and anxiety than in Thailand and China, where it is rarely

used (Lansford et al., 2005). These findings require us to view parenting styles in a cultural context—no one style is universally “best” (Parke & Burriel, 2006).

Peer Friendships and Popularity

Social development over childhood occurs in a world that broadens to include siblings, playmates, and classmates. Relationships with other children start early (Hay, Caplan, & Nash, 2011). By two months of age, infants engage in mutual gazing. By six months, they vocalize and smile at each other. By eight months, they prefer to look at another child rather than at an adult (Bigelow et al., 1990). In other words, even infants are interested in other people, but it's a long journey from interest to intimacy.

Observations of two-year-olds show that the most they can do with their peers is to look at them, imitate them, and exchange—or grab—toys. By age four, they begin to play “pretend” together, agreeing about roles and themes (Coplan & Arbeau, 2011). This kind of play is important because it provides a new context for communicating desires and feelings and offers an opportunity to form first “friendships” (Dunn & Hughes, 2001). In the school years, peer interaction becomes more frequent, complex, and structured. Children play games with rules, join teams, tutor each other, and cooperate—or compete—in achieving goals. Friends become more important and friendships longer lasting as school-age children find that friends are a source of companionship, stimulation, support, and affection (Hartup & Stevens, 1997). In fact, companionship and fun are the most important aspects of friendship for children at this age. Psychological intimacy does not enter the picture until adolescence (Parker et al., 2001).

Friends help children establish a sense of self-worth (Harter, 2012). Through friendships, children compare their own strengths and weaknesses with those of others in a supportive and accepting atmosphere. Some children have more friends than others. When children are asked to nominate the classmates they like the best and the least, those who get the most votes—the *popular children*—tend to be the ones who are friendly, assertive, and who communicate well; they help set the rules for their group and use positive social behavior, such as helping others. They attract more attention, especially from other popular kids (Lansu, Cillessen, & Karremans, 2013). Especially in early adolescence, children who are athletic, arrogant, or aggressive may also be popular, if their aggressiveness is not too extreme (Asher & McDonald, 2011).

About 10 percent of schoolchildren have no friends. Some, known as *rejected children*, are actively disliked, either because they are too aggressive or because they are anxious and socially unskilled. Others, called *neglected children*, are seldom mentioned in peer nominations; they are isolated, quiet, and withdrawn but not necessarily



Children's Friendships

Although relationships with peers may not always be this friendly, they are often among the closest and most positive in a child's life. Friends are more interactive than nonfriends; they smile and laugh together more, pay closer attention to equality in their conversations, and talk about mutual goals. Having at least one close friend in childhood predicts good psychological functioning later on (Laursen et al., 2007; Parker et al., 2001).

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disliked. Friendless children tend to do poorly in school and usually have psychological and behavior problems later in life (Asher & Hopmeyer, 2001; Ladd & Troop-Gordon, 2003). Having even one close, stable friend may protect schoolchildren from such problems (Laursen et al., 2007; Parker et al., 2001). Overall, the single most important factor in determining children's popularity may be the *social skills* they learn from childhood to adolescence (Rubin, Bukowski, & Parker, 2006).

Social Skills

Changes in peer interactions and relationships over childhood show children's increasing social talents and understanding. Social skills, like cognitive skills, are learned (Rubin et al., 2006).

One important social skill is the ability to engage in sustained, responsive interactions. These interactions require cooperation, sharing, and taking turns—behaviors that first appear in the preschool years. A second social skill that children learn is the ability to detect and correctly interpret other people's emotional signals as well as understand the causes of emotion (Weimer, Sallquist, & Bolnick 2012). Much as children's school performance depends on processing academic information, their social performance depends on processing emotional information.

A related set of social skills includes being able to feel what another person is feeling, or *empathy*, and to comfort or help others in distress. Children whose social skills include these abilities tend to be the most popular in their peer groups (Izard et al., 2001; Rubin et al., 2006). Children without these skills tend to be rejected or neglected; they may become bullies or the victims of bullies.

Bullying has attracted intense attention in recent years, not only because its victims often experience reduced self-esteem and depression (Messias, Kindrick, & Castro, 2014; Zwierzynska, Wolke, & Lereya, 2013; van Geel, Vedder, & Tanilon, 2014), but also because some of the victims have committed suicide or sought revenge through school shootings and other violent acts. A bully's aggression can take the form of hitting, pushing, threatening, or taunting, but can also involve spreading rumors and other forms of harassment, including cyberbullying, in which communications through Internet devices are used to torment victims (Patchin & Hinduja, 2012; Wolak et al., 2006). Combating the problem is not easy and increasingly is becoming a legal matter. As of 2013, every state in the United States except Montana has anti-bullying laws (Hinduja & Patchin, 2013).

Parents, other adults, and even older siblings can help children develop adaptive social skills by engaging them in "pretend" play and other prosocial activities and by encouraging constructive expression of emotion (Eisenberg, Fabes, & Spinrad, 2006; Ladd, 2005). Empathy may start early in childhood. When a baby spontaneously cries and fusses, a six-month-old nearby typically orients toward the infant by leaning, gesturing, or touching, and making concerned facial expressions and vocalizations (Davidov et al., 2013).

The ability to control one's emotions and behavior—an ability known as **self-regulation**—is another social skill that develops in childhood (Rothbart & Bates, 2006; Thompson, Lewis, & Calkins, 2008). In the first few years of life, children learn to calm or console themselves by sucking their thumbs or cuddling their favorite blanket (Posner & Rothbart, 2000). Later they learn more-sophisticated self-regulation strategies. These include waiting for something they want rather than crying or grabbing for it (Eisenberg et al., 2004), counting to ten in order to control anger, planning ahead to avoid a problem (e.g., getting on the first bus to avoid a disliked peer), and recruiting social support (e.g., casually joining a group of big kids to walk past a playground bully). Children who regulate their emotions poorly tend to have anxiety and do not recover well from stressful events. They become emotionally overaroused when they see someone in distress and are often unsympathetic and unhelpful (Eisenberg et al., 2006). Further, boys whose emotions are easily aroused and have difficulty regulating this arousal become less and less popular with their peers and may develop problems with aggressiveness (e.g., Eisenberg et al., 2004, 2009).

self-regulation The ability to control one's emotions and behavior.

FOCUS ON RESEARCH METHODS

EXPLORING DEVELOPING MINDS

Children's ability to make sense of other people's behavior depends on understanding the thinking behind another person's actions. Critical to this understanding is the recognition that what other people think may be wrong. For more than twenty years, researchers have argued that children under four years of age cannot understand other people's mental states because they do not yet have a "theory of mind." This argument was based on studies in which children were asked questions about other people's beliefs (e.g., Baron-Cohen, Leslie, & Frith, 1985). In one study, children were shown a simple little drama starring two dolls, "Sally" and "Anne." First, Sally puts a marble in her basket and then leaves the stage. While Sally is away, Anne takes the marble out of Sally's basket and puts it into her own box. Then Sally returns to get her marble, and the child is asked where Sally will look for it. To correctly predict that Sally will look in the basket where she last saw the marble, the children in this study would have to recognize that Sally has a false belief about its location. Even though they know where the marble really is, they will have to be able to "read Sally's mind," realize what she must be thinking, and say "she'll look in her basket." However, most children under the age of four ignore the fact that Sally thinks the marble is still in her basket and say that she'll look in Anne's box.

What was the researcher's question?

Renee Baillargeon (pronounced "by-ar-ZHAN") wondered, though, whether the inability of these young children to recognize what others are thinking reflected a true lack of a "theory of mind" or was the result of using research methods that were not sensitive enough to detect its existence. So her research question was whether more specialized methods might reveal that even children under four can understand that other people's behavior is affected by their mental states, including false beliefs and false perceptions.

How did the researcher answer the question?

Instead of requiring children to answer questions about other people's behavior, Baillargeon used a more creative and potentially more sensitive method to probe young children's knowledge. She reasoned that infants' tendency to look longer at certain events indicates that those events violate their expectations about the world, so she showed infants various events and then carefully measured the amount of time they spent looking at them.

Baillargeon used this method to measure the ability of fifteen-month-old infants to predict where a woman would look for a toy, depending on whether she had a true or a false belief about the toy's location (Onishi & Baillargeon, 2005). Each infant first watched the woman play with a toy watermelon slice for a few seconds, then hide it inside a green box. Next, the woman watched the toy being moved from the green box to a yellow box. Then she left the scene, and while she was gone the toy was put back into the green box. When she came back, she looked for the toy by reaching either into the green box or the yellow box. Baillargeon reasoned that if the infants expected the woman to search for the toy on the basis of her false belief that it was still in the yellow box, they would look longer at her if she violated their expectation by searching in the green box instead. This would suggest that they were thinking "Hey, how could she know the toy had been moved? I expected her to look where she last saw it!" But if, as earlier studies had suggested, the infants really had no "theory of mind," they would ignore the woman's false belief and expect her to look in the green box, where they knew the toy now lay. If the woman did that, they would not pay any special attention to her action.

What did the researcher find?

The results of this study showed that, contrary to what would be expected from previous research, the infants did look longer when the woman looked for the toy in the green box.

What do the results mean?

These results argue that children under the age of four do have a "theory of mind." When evaluated using appropriate research methods, these young children demonstrate an ability

(continued)

to recognize that other people's beliefs and perceptions can be false, that those beliefs and perceptions can differ from the child's own, and that these mental states affect the other person's behavior (Baillargeon, Scott, & He, 2010).

What do we still need to know?

Among other things, it would be good to know more about the extent of infants' understanding of mental states. Does it appear in other situations? Baillargeon has begun to explore this question. In one study, infants viewed a scene in which a woman looked for a doll with blue pigtails. She could look in either a plain box or in a box that had a blue tuft of hair sticking out from under its lid (Song & Baillargeon, 2008). The infants knew that the doll was in the plain box, but they stared longer when the woman looked in that box first; this suggested that they expected her to be misled by the blue tuft of hair and to falsely perceive it as belonging to the doll. In another study, Baillargeon investigated whether infants know that new information can correct an adult's false belief (Song et al., 2008). In this case, infants watched an adult hide a ball in a box while another adult watched. After the first adult left the scene, the second adult moved the ball from the box to a cup. When the first adult returned, the second adult told her "The ball is in the cup!" Infants stared longer if the adult searched for the ball in the box despite this corrective information. Those who saw her reach for the cup did not pay special attention, suggesting that they expected her to do so once her false belief had been corrected.

What other mental states can infants understand (Palmquist & Jaswal, 2012)? Do they also realize that other people's behavior can be influenced by goals, intentions, emotions, and even by the fairness or unfairness of a situation (LoBue, Nichida et al., 2011; Sloane, Baillargeon, & Premack, 2012; Warneken et al., 2011)? How soon after birth does a "theory of mind" develop? These are among the dozens of additional questions that remain for future research in this fascinating area of developmental psychology (Woodward, 2009).

Gender Roles

LINKAGES Who teaches boys to be men and girls to be women? (a link to Learning)



Learning Gender Roles

In every culture, socialization by parents and others typically encourages the interests, activities, and other characteristics traditionally associated with a child's own gender.

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An important aspect of understanding other people is knowing about social roles, including those linked to being male or female. All cultures establish expectations about **sex roles**—also known as **gender roles**—which are the general patterns of work, appearance, and behavior associated with being a man or a woman (Blakemore, Berenbaum, & Liben, 2009). Gender roles appear in every culture, but they are more pronounced in some cultures than in others. One analysis revealed, for example, that where smaller differences in social status exist between males and females, gender-role differences are smaller as well (Wood & Eagly, 2002). In North America, some roles—such as homemaker and firefighter—have traditionally been tied to gender, although these traditions are weakening. Research by Deborah Best suggests that although children show gender-role expectations earliest in Muslim countries (where the differences in roles are perhaps most extreme), children in all twenty-five countries she studied eventually developed them (Best, 1992; Williams & Best, 1990).

Gender roles endure because they are deeply rooted in both nature and nurture. Small physical and behavioral differences between boys and girls appear early and tend to increase over time. For example, girls tend to speak and write earlier, with better grammar and spelling than boys (Halpern, 2012). Girls read emotions at younger ages than boys (Dunn et al., 1991) and more often ask for or offer help (Benenson & Koulnazarian, 2008). Girls play more with dolls, interact more with caregivers, and show gender-stereotyped activities during play (for example, pretending to "cook" in a kitchen area) (Alexander & Saenz, 2012; Fausto-Sterling, Coll, & Lamarre, 2012). Boys tend to be more skilled at manipulating objects, building three-dimensional forms, and mentally manipulating complex figures and pictures (Choi & Silverman, 2003; Newhouse, Newhouse, & Astur, 2007). They spend more time playing with blocks, vehicles, and tools (Alexander & Saenz, 2012; Fausto-Sterling,

Coll, & Lamarre, 2012). They are more physically active and aggressive and are more inclined to hit objects or people (Baillargeon et al., 2007; Card et al., 2008; Ostrov, 2006). They play in larger groups and spaces and enjoy noisier, more strenuous physical games (Fabes, Martin, & Hanish, 2003; Rose & Rudolph, 2006).

Biological Factors

A biological contribution to male-female differences is suggested by several lines of evidence. First, studies show sex differences in anatomy, hormones, and brain organization and functioning (Geary, 2010; Ruble, Martin, & Berenbaum, 2006). Second, cross-cultural research reveals consistent gender patterns at an early age, despite differing socialization practices (Baillargeon et al., 2007; Simpson & Kenrick, 1997). Third, research with non-human primates finds sex differences that parallel those seen in human children. Young female animals prefer playing with dolls, and young male animals prefer playing with a toy car, for example (Alexander & Hines, 2002; Williams & Pleil, 2008). Fourth, research in behavioral genetics shows that genes exert a moderate influence on the appearance of gender-typed behaviors (Iervolino et al., 2005).

Social Factors

Socialization influences gender roles, partly by exaggerating sex differences that may already exist (Hyde, 2005, 2007). From birth, boys and girls are treated differently (Lobue & DeLoache, 2011). Adults usually play more gently with, and talk more to, infants they believe to be girls than infants they believe to be boys (Culp, Cook, & Housley, 1983). They often give their daughters dolls and tea sets, their sons trucks and tools. They tend to encourage boys to achieve, compete, and explore; to control their feelings; to be independent; and to assume personal responsibility. They more often encourage girls to be expressive, nurturing, reflective, dependent, domestic, obedient, and unselfish (Blakemore et al., 2009; Ruble, Martin, & Berenbaum, 2006). Parents spend more time vocalizing to daughters than to sons (Fausto-Sterling, Coll, & Lamarre, 2012) and engage in more physical play with boys and more reading activities with girls (Leavell et al., 2012). In short, parents, teachers, and television role models consciously or accidentally pass on their ideas about “appropriate” behaviors for boys and girls (Else-Quest et al., 2010; Parke & Buriel, 2006; Ruble et al., 2006).

They also convey information about gender-appropriate interests (Wood & Eagly, 2012). For example, sixth-grade girls and boys express equal interest in science and earn the same grades. Yet parents underestimate their daughters’ interest in science, believe that science is difficult for them, and are less likely to give them scientific explanations when working on a physics task (Tenenbaum & Leaper, 2003) or visiting a science museum (Crowley et al., 2001; Leinhardt & Knutson, 2004). They do not encourage their daughters to select science courses in school (Tenenbaum, 2009). Additionally, even though girls have the same aptitudes as boys (Schmidt, 2011), they may choose not to enter technical fields in which they feel, or have been taught, that they do not belong (Diekman et al., 2010; Good, Rattan, & Dweck, 2012).

Children also pick up ideas about gender-appropriate behavior from their peers (Martin et al., 2013). For example, boys tend to be better than girls at computer or video games (Greenfield, 1994). However, this difference stems partly from the fact that boys encourage and reward each other for skilled performance at these games more than girls do (Law, Pellegrino, & Hunt, 1993). Children are also more likely to play with children of the same sex and in gender-typical ways on the playground than they are in private, at home, or in the classroom (Luria, 1992; Martin & Ruble, 2009). An analysis of 143 studies of sex differences in aggression showed that boys acted significantly and consistently more aggressively than girls, but especially so when they knew they were being watched (Hyde, 1986). Among girls, aggression is less obvious; it is usually “relational aggression” that shows up in nasty words or social exclusion, not punching (Benenson et al., 2011; Crick et al., 2004; McAndrew, 2014).

gender roles (sex roles) Patterns of work, appearance, and behavior that a society associates with being male or female.

In short, social and cultural training tends to support and amplify any biological predispositions that distinguish boys and girls. Gender roles reflect a mix of nature and nurture.

Parents' efforts to deemphasize gender roles in their children's upbringing may be helping to reduce the size of sex differences in areas such as verbal and quantitative skills. And their efforts may be changing children's ideas about gender roles. One recent study found that four- to eight-year-old children tended to think of gender roles as personal choices rather than social imperatives (Conry-Murray, & Turiel, 2012). However, evolutionary psychologists suggest that some sex differences are unlikely to change much; for example, males' greater ability to visualize the rotation of objects in space and females' greater ability to read facial expressions (Quinn & Liben, 2008). Evolutionary psychologists see these differences as deeply rooted reflections of gender-related hunting versus child-rearing duties that were adaptive eons ago for the survival of both sexes (Buss, 2004a; Geary, 2010). Others have suggested that such differences result from prenatal exposure to male or female hormones that shape brain development in different ways (Halpern, 2012; Vuoksimaa et al., 2010). Still others see gender differences as reflecting social inequality, not just biological destiny (Wood & Eagly, 2002). Whatever the cause of gender differences, it is important to remember that most of them are quite small (Ardila et al., 2011; Hyde, 2005). (Gender roles and other elements of early development are summarized in "In Review: Social and Emotional Development during Infancy and Childhood.")

IN REVIEW

SOCIAL AND EMOTIONAL DEVELOPMENT DURING INFANCY AND CHILDHOOD

Age	Relationships with Parents	Relationships with Other Children	Social Understanding
Birth–2 years	Infants form an attachment to the primary caregiver.	Play focuses on toys, not on other children.	Infants respond to emotional expressions of others.
2–4 years	Children become more independent and no longer need their parents' constant attention.	Toys are a way of eliciting responses from other children.	Young children can recognize emotions of others.
4–10 years	Parents actively socialize their children.	Children begin to cooperate, compete, play games, and form friendships with peers.	Children learn social rules (such as politeness) and roles (such as being a male or female).

In Review Questions

- As part of their social development, children learn _____, which tell them what patterns of appearance and behavior are associated with being male or female.
- Teaching children to talk quietly in a restaurant is part of the process called _____.
- Strict rules and the threat of punishment are typical of _____ parenting.

resilience A quality allowing children to develop normally in spite of severe environmental risk factors.

Risk and Resilience

Family instability, child abuse, homelessness, parental unemployment, poverty, substance abuse, and domestic violence put many children at risk for various difficulties in social and emotional development (Ackerman, Brown, & Izard, 2004; Karevold et al., 2009). Children

vary in how well they ultimately adjust to these stressors. Even when the odds are against them, some children are left virtually unscathed by even the most dangerous risk factors. These children are said to be resilient. **Resilience** is a characteristic that permits successful development in the face of significant challenge. It has been studied throughout the world in a variety of adverse situations, including war, natural disaster, family violence, child maltreatment, and poverty. This research has consistently identified certain qualities in children and their environments that are associated with resilience. Specifically, resilient children tend to be intelligent and to have easy temperaments, high self-esteem, talent, and faith (Masten 2013). They are cheerful, focused, and persistent in completing a task (Wills et al., 2001). They also typically have significant relationships with a warm and authoritative parent, with someone in their extended family, or with other caring adults outside the family, at school, or in clubs or religious organizations (Rutter, 2006). In addition, they have genes that direct optimal regulation of serotonin, a neurotransmitter that, as described in the chapter on biological aspects of psychology, plays a role in mood and stress-related responses (Kim-Cohen & Gold, 2009). There appear to be long-term benefits for resilient kids who faced adversity in childhood. When they confront new problems later in life, they adapt better than people who had experienced little or no childhood difficulty (Luthar & Barkin, 2012; Masten & Tellegen, 2012). They also appear to have better long-term mental health outcomes than those who experienced either *extreme* adversity or *no* adversity (Seery, 2011).

ADOLESCENCE

What threatens adolescents' self-esteem?

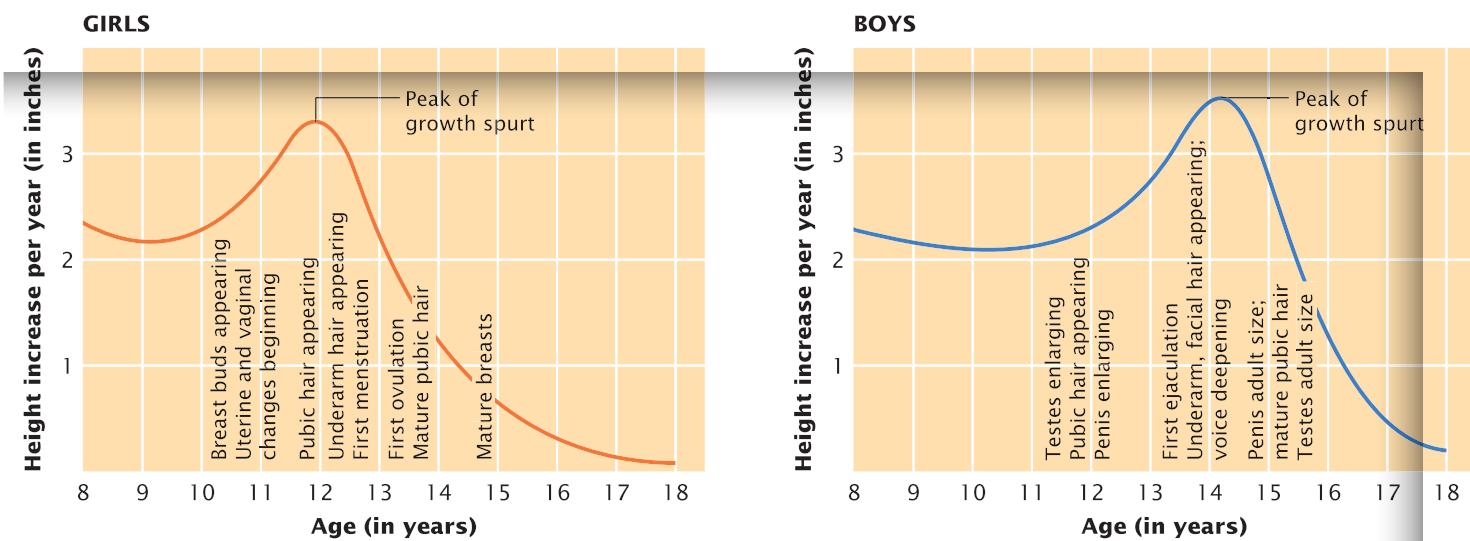
The years of middle childhood usually pass smoothly as children busy themselves with schoolwork, hobbies, friends, and clubs. But in adolescence, things change dramatically. All adolescents undergo significant changes in size, shape, and physical capacities. In Western cultures, many adolescents also experience huge changes in their social lives, reasoning abilities, and views of themselves.

Changes in Body, Brain, and Thinking

A sudden spurt in physical growth is a visible signal that adolescence has begun. This growth spurt peaks at about age twelve for girls and at about age fourteen for boys (Tanner, 1978; see Figure 11.6). Suddenly, adolescents find themselves in new bodies. At around the

FIGURE 11.6
Physical Changes in Adolescence

At about ten and a half years of age, girls begin their growth spurt, and by age twelve, they are taller than their male peers. When boys, at about twelve and a half years of age, begin their growth spurt, they usually grow faster and for a longer period of time than girls. Adolescents may grow five inches in a year. Sexual characteristics develop too. The ages at which these changes occur vary across individuals, but the sequence of changes is the same.





Digital Connections

Compared to adults and children, adolescents spend more time online and communicating electronically to stay in touch with people in their social networks (Reich, Subrahmanyam, & Espinoza, 2012; Valkenburg & Peter, 2007a, 2009). About a third of them believe that online communication is more effective than in-person conversation for disclosing intimate personal information. We do not yet know what (if any), long-term effects the constant use of social media might have on adolescents' cognitive functioning and academic performance, or whether it has positive or negative effects on the size of young people's social networks, their feelings of well-being, or their closeness to friends.

Britt Erlanson/Cultura/Getty Images

peak of the growth spurt, menstruation begins in females and live sperm are produced in males. This condition of being able to reproduce is called **puberty**.

These dramatic changes in teenagers' bodies are accompanied by significant changes in their brains, especially in parts of the frontal lobes known as the prefrontal cortex (Kuhn, 2006; Spear, 2000). These areas are vital to the ability to think flexibly, to act appropriately in challenging situations, and to juggle multiple pieces of information. They are also involved in skills such as planning and organization, controlling impulses, and allocating attention.

In Western cultures, the changes of *early adolescence*, from approximately ages eleven to fourteen, can be disorienting. Adolescents—especially early-maturing girls—may have depression, insomnia, or other psychological problems (Johnson et al., 2006; Mendle, Turkheimer, & Emery, 2007; Ohring, Gruber, & Brooks-Gunn, 2002). This is also when eating disorders may first appear (Wilson et al., 1996).

As sex hormones and pleasure-related brain systems become more active, sexual interest stirs and the prospect of smoking or using alcohol or illegal drugs becomes more appealing (Patton et al., 2004; Reyna & Farley, 2006). Opportunities to do these things increase because adolescents may spend more time with peers than family, be more influenced by peers, and take more risks and seek out more novel sensations than either younger children or adults (Harden, Quinn, & Tucker-Drob, 2012; Steinberg, 2008).

Much of this risk-taking seems to be due to the different rates at which parts of the adolescent brain develop. The areas of prefrontal cortex involved in planning and impulse control do not finish developing until long after the emotional and reward-related areas of the limbic system do (Chein et al., 2011; Steinberg, 2008; Vetter-O'Hagen & Spear, 2012). So, as one researcher put it, the teenage brain is like a car with a good gas pedal but a weak brake (Ritter, 2007). Adolescents can make rational decisions and appreciate right versus wrong, but when confronted with stressful or emotional decisions, they may act impulsively, without fully understanding or analyzing the consequences of their actions. Especially when with peers, teens may take risks despite clearly recognizing the dangers involved (Smith, Chein, & Steinberg, 2014). Of course, a certain amount of adolescent risk-taking and sensation-seeking is normal. In fact, adolescents who engage in moderate risk-taking tend to be more socially competent than those who take no risks or extreme risks (Spear, 2000).

Some of the problems of adolescence appear as young people begin to face threats to *self-esteem*—a sense of being worthy, capable, and deserving of respect (Harter, 2012). Adolescents are especially vulnerable if other stressors occur at the same time (DuBois et al., 1992; Kling et al., 1999). The switch from elementary school to middle school is particularly challenging (Eccles, Lord, & Buchanan, 1996; Wigfield et al., 2006). Declining grades are especially likely among students who were already having trouble in school or who don't have confidence in their own abilities (Eccles & Roeser, 2003; Rudolph et al., 2001). But grades do not affect self-esteem in all teens; many base their self-esteem primarily on what others think of them or on other social factors that might affect their feelings of self-worth (Crocker & Wolfe, 2001).

The changes and pressures of adolescence often play out at home. Many teens become discontented with their parents' rules and values, leading to arguments over everything from taking out the garbage to who left the gallon of milk on top of the refrigerator. They want more control over their lives, whether it involves going to the mall or getting tattoos or body piercings—especially if they think that their friends enjoy such control (Daddis, 2011). Serious conflicts may lead adolescents—especially those who do not feel close to their parents—to serious problems, including running away, pregnancy, stealing, drug use, or suicide (Goldstein, Davis-Kean, & Eccles, 2005; Klahr et al., 2011). Fortunately, although the bond with parents weakens during early to mid-adolescence, most adolescents and young adults maintain fairly good relationships with parents (e.g., McGue

puberty The condition of being able, for the first time, to reproduce.



Mothers Too Soon?

More than half of the U.S. adolescents who become pregnant elect to keep their babies and become single mothers. These young women and their children are likely to face special academic, social, and other problems. For this reason, support programs for teenage mothers have been developed, and a number of them have reported some success in three areas: alleviating the mothers' symptoms of depression, increasing the mothers' parenting capabilities, and achieving the mothers' educational goals (Cox et al., 2008; Sadler et al., 2007).

Ebby May/The Image Bank/Getty Images

et al., 2005; Moore, 2005). That's a good thing, because adolescents who maintain positive relationships with parents are better adjusted in early adulthood and show less depression, anxiety, suicidal behavior, drug abuse, or criminal activity (Ogilvie et al., 2014; Raudino, Raudino, & Horwood, 2013).

Love and Sex in Adolescence

Nearly half of fifteen-year-olds and 70 percent of eighteen-year-olds in North America have romantic relationships (Collins & Steinberg, 2006), and about a third of sixteen-year-olds and half of seventeen-year-olds in the United States are sexually active (Guttmacher Institute, 2013). Teens who have sex differ from those who do not (Huibregtse et al., 2011). They hold less conventional attitudes and values and are more likely to smoke, use alcohol and other drugs (National Center on Addiction and Substance Abuse, 2004), be aggressive, and have attention problems in school (Schofield et al., 2008). They also spend more unsupervised time after school (Cohen & Steele, 2002), they are more likely to belong to peer groups with socially deviant behavioral norms (diNoia & Schinke, 2008), they are more likely to have sexually active best friends (Jaccard, Blanton, & Dodge, 2005), and they are more likely to live in poverty (Belsky, Schlammer, & Ellis, 2012). Their parents tend to be less educated, less likely to exert control over them, less supportive, and less able to talk openly (Price & Hyde, 2011). The typical pairing of sexually active heterosexual teens is a "macho" male and a "girly" female (Udry & Chantala, 2003). Adolescents who showed poor self-control skills as children are the ones most likely to take greater sexual risks, such as having multiple partners and not using condoms (Atkins, 2008; Raffaelli & Crockett, 2003).

Teenage sexual activity is associated with declining interest in academic achievement and in school generally (Frisco, 2008), sexually transmitted diseases, and unwanted pregnancies. Teenage girls have the highest rates of sexually transmitted diseases of any age group (Forhan et al., 2009). About half of the 19 million cases of sexually transmitted diseases reported each year occur in adolescents (Malhotra, 2008); these cases include about one-fourth of all teenage girls (Contemporary Sexuality, 2008; Hampton, 2008).

Nearly 18 percent of teenage girls in the United States get pregnant before they reach age nineteen, and about 415,000 of them become teenage mothers (Martin et al., 2011; Perper & Manlove, 2009). The teens most likely to become pregnant are those with little confidence in themselves or in their educational futures (Chandra et al., 2008; Young et al., 2004). A teenage pregnancy can create problems for the mother, the baby, and others in the family. For one thing, the mother is less likely to complete high school (Perper, Peterson, & Manlove, 2010). The education of younger siblings may be affected, too, because they may have to take time away from schoolwork to help care for the baby. These siblings are also at increased risk for drug and alcohol use and, for sisters, of becoming pregnant themselves (East & Jacobson, 2001; Monstad, Propper, & Salvanesvc, 2011). The baby is less likely than an older mother's child to survive its first year (Phipps, Blume, & DeMonner, 2002). This danger may occur partly because teenage parents tend to be less positive and stimulating with their children than older parents and are more likely to abuse them (Brooks-Gunn & Chase-Lansdale, 2002). The children of teenage parents are also more likely to develop behavior problems and to do poorly in school than children whose parents are older (Hoffman, 2008; Moffitt, 2002).

Violent Adolescents

Some people respond to the challenges of adolescence with violence. The roots of teenage violence lie partly in genetic factors (e.g., Cicchetti, Rogosch, & Thibodeau, 2012; Latendresse et al., 2011). Among the other factors that increase the risk of violent behavior in adolescence are insecure attachments, fearlessness, low intelligence, lack of empathy, lack of emotional self-regulation, aggressiveness, and moral disengagement (e.g., Eisenberg et al., 2004; Marceau et al., 2013; Ogilvie et al., 2014; Pepler et al., 2008). Gender is another

important factor (Baxendale, Cross, & Johnston, 2012). Worldwide, the rate of homicide committed by males is more than thirty times higher than the rate for females (Cassel & Bernstein, 2007).

Several environmental factors are also associated with increased risk of youth violence, including maternal depression, rejection, living in violent neighborhoods (Herrenkohl et al., 2004), involvement with delinquent gangs or antisocial peers (Burt, McGue, & Iacono, 2009; Rutter, 2003), poverty (Strohschein, 2005), malnutrition (Liu et al., 2004), and exposure to violent television and video games (Comstock & Scharrer, 2006; Nicoll & Kieffer, 2005). Peers are particularly influential. Adolescent violence is also more likely when children grow up witnessing family violence, clashing with siblings, or experiencing physical abuse (Cicchetti, Rogosch, & Thibodeau, 2012; Ehrensaft et al., 2003; Noland et al., 2004).

Despite the potential problems of adolescence, most teens in Western cultures are not violent and do not experience major personal turmoil or family conflicts. So although most parents and teachers seem to believe that adolescence is a time of “storm and stress” (Hines & Paulson, 2007), research suggests that more than half of today’s teens find adolescence relatively trouble-free (Arnett, 1999, 2007b; Chung, Flook, & Fuligni, 2009). Only about 15 percent of the adolescents studied experience serious distress (Steinberg, 1990). Most adolescents cope well with the changes puberty brings and soon find themselves in the midst of perhaps the biggest challenge of their young lives: preparing themselves for the transition to young adulthood.

Identity and Development of the Self

In many less economically developed nations today, as in the United States in the nineteenth century, early adolescence ends at around age fifteen. This age marks the onset of adulthood—a time when work, parenting, and grown-up responsibilities begin. In modern North America, the transition from childhood to adulthood often lasts well into the twenties. Adolescents spend a lot of time being students or trainees. This lengthened adolescence has created special problems—among them, the matter of finding or forming an identity.

Forming a Personal and Ethnic Identity

Preschool children asked to describe themselves often mention a favorite or habitual activity: “I watch TV” or “I play sports.” At eight or nine, children identify themselves by giving facts such as gender, age, name, physical appearance, and their likes and dislikes. They may still describe themselves by what they do, but they include how well they do it compared to others. Then, at about age eleven, children begin to describe themselves by social relationships, personality traits, and other general, stable psychological qualities such as “smart” or “friendly” (Sakuma, Endo, & Muto, 2000; Shaffer, 1999). By the end of adolescence, self-descriptions emphasize personal beliefs, values, and moral standards (Harter, 2012). These changes in the way children and adolescents describe themselves suggest changes in how they think about themselves (Davis-Kean, Jager, & Collins, 2009). As they become more self-conscious, they gradually develop a personal identity as unique individuals.

Their personal identity includes an **ethnic identity**—the part of identity that reflects the racial, religious, or cultural group to which the person belongs (French et al., 2006; Quintana, 2010). In melting-pot nations such as the United States, some members of ethnic minorities may identify with their ethnic group—Chinese, Mexican, or Italian, for example—even more than with their national citizenship. Children are aware of ethnic cues such as skin color before they are three years old. Minority-group children notice these cues earlier than other children and prefer to play with children from their own group (Milner, 1983). In high school, most students hang out with members of their own ethnic group. They tend not to know classmates in other ethnic groups as well, seeing them more as members of groups than as individuals (Steinberg, Dornbusch, & Brown, 1992). A positive ethnic identity adds to self-esteem, partly because seeing their own group as superior makes people feel good about themselves and creates positive attitudes about education

ethnic identity The part of a person's identity that reflects the racial, religious, or cultural group to which that person belongs.



Hanging Out, Separately

TRY THIS Ethnic identity is that part of our personal identity that reflects the racial, religious, or cultural group to which we belong. Ethnic identity often leads people to interact mainly with others who share that same identity. To what extent is this true of you? You can get a rough idea by jotting down the ethnicity of all the people you chose to spend time with over the past week or so.

Bill Aron/PhotoEdit

(Fiske, 1998; Fuligni, Witkow, & Garcia, 2005). Adolescents with a strong ethnic identity are more likely to do well academically and less likely to break the law, become depressed, or be adversely affected by racial discrimination (e.g., Adelabu, 2008; Mandara et al., 2009; Neblett et al., 2012). Parents and other mentors play a major role in developing adolescents' ethnic identity by imparting cultural traditions, instilling pride in ethnic heritage, and preparing children for hardships that can be a part of minority status (Hurd et al., 2012; Seaton et al., 2012). Daily contact with others from one's ethnic group is also related to positive ethnic identity (Yip, Douglass, & Shelton, 2013).

As described in the chapter on social psychology, the same processes that create ethnic identity can also sow the seeds of ethnic prejudice, but such prejudice is not inevitable. Adolescents who regularly interact with members of other ethnic groups usually develop more mature ethnic identities and express more favorable attitudes toward people of other ethnicities (Phinney, Jacoby, & Silva, 2007).

Facing the Identity Crisis

Identity formation is the central task of adolescence in Erikson's theory of psychosocial development. According to Erikson (1968), events of late adolescence—graduating from high school, going to college, forming new relationships—challenge an adolescent's self-concept and trigger an **identity crisis** (see Table 11.2). In this crisis, the adolescent must develop the self-image of a unique person by pulling together self-knowledge acquired earlier. According to Erikson, if infancy, childhood, and early adolescence brought trust, autonomy, initiative, and industry, adolescents will resolve the identity crisis positively and develop feelings of self-confidence and competence. However, if infancy and childhood created feelings of mistrust, shame, guilt, and inferiority, adolescents will be confused about their identity and goals.

In Western cultures there is some limited empirical support for Erikson's ideas about the identity crisis. In late adolescence, young people do consider alternative identities (Roberts, Walton, & Viechtbauer, 2006; Waterman, 1982). They may "try out" being rebellious, studious, or detached as they attempt to resolve questions about sexuality, self-worth, industriousness, and independence, but late adolescence is also a time when many people become more aware of their obligations to their families (Fuligni & Pedersen, 2002). By the time they are twenty-one, about half of the adolescents studied have resolved the identity crisis in a way that is consistent with their self-image and the historical era in which they are living. They enter young adulthood with self-confidence. They are basically the same people they were when they entered adolescence, but they now have more mature attitudes and behavior, more consistent goals and values, and a clearer idea of who they are (Savin-Williams & Demo, 1984). For those who fail to resolve identity issues—either because they avoided the identity crisis by accepting the identity their parents set for them or because they postponed dealing with the crisis and remain uncommitted and lacking in direction—there are often problems ahead (Lange & Byrd, 2002).

Moral Development

Adolescents are able to develop an identity partly because, according to Piaget's theory, they have entered the period of *formal operations*, which allows them to think logically and reason about abstract concepts. Adolescents often find themselves applying these advanced cognitive skills to questions of morality.

Kohlberg's Stages of Moral Reasoning

To examine how people think about morality, Lawrence Kohlberg asked them to explain how they would resolve certain moral dilemmas. Perhaps the most famous of these is the "Heinz dilemma," in which people decide whether a man named Heinz should steal a rare and unaffordable drug to save his wife's life. By posing dilemmas such as this one, Kohlberg found that the reasons given for moral choices change systematically and consistently with

identity crisis The phase during which an adolescent attempts to develop an integrated self-image as a unique person by pulling together self-knowledge acquired during childhood.

TABLE 11.3 KOHLBERG'S STAGES OF MORAL REASONING

Kohlberg's stages of moral reasoning describe differences in how people think about moral issues. Some researchers have suggested that the changes seen from stage to stage are partly attributable to developments in the brain that allow greater cognitive complexity and empathy (van den Bos et al., 2011). Here are some examples of answers that people at different stages of development might give to the "Heinz dilemma" described in the text. This dilemma is more realistic than you might think. In 1994, a man was arrested for robbing a bank after being turned down for a loan to pay for his wife's cancer treatments.

Stage	What Is Right?	Should Heinz Steal the Drug?
Preconventional		
1.	Obeying and avoiding punishment from a superior authority	"Heinz should not steal the drug because he will be jailed."
2.	Making a fair exchange, a good deal	"Heinz should steal the drug because his wife will repay him later."
Conventional		
3.	Pleasing others and getting their approval	"Heinz should steal the drug because he loves his wife and because she and the rest of the family will approve."
4.	Doing your duty, following rules and social order	"Heinz should steal the drug for his wife because he has a duty to care for her," or "Heinz should not steal the drug because stealing is illegal."
Postconventional		
5.	Respecting rules and laws but recognizing that they may have limits	"Heinz should steal the drug because life is more important than property."
6.	Following universal ethical principles such as justice, reciprocity, equality, and respect for human life and rights	"Heinz should steal the drug because of the principle of preserving and respecting life."

preconventional level Moral reasoning that is not based on the conventions or rules that guide social interactions in a society.

moral development The growth of an individual's understanding of the concepts of right and wrong.

conventional level Moral reasoning that reflects a concern about other people as well as the belief that morality consists of following rules and conventions.

postconventional level Moral reasoning that reflects moral judgments based on personal standards or universal principles of justice, equality, and respect for human life.

age (Kohlberg & Gilligan, 1971). Young children make moral judgments that differ from those of older children, adolescents, or adults. Kohlberg argued that moral reasoning develops in six stages, summarized in Table 11.3. These stages, he said, are not tightly linked to chronological age. Instead, there is a range of ages for reaching each stage, and not everyone reaches the highest level.

Stage 1 and Stage 2 moral judgments, which are most typical of children under age nine, tend to be selfish. Kohlberg called this the **preconventional level** of moral reasoning because it is not based on the conventions or rules that often guide social interactions in society. People at this level of **moral development** are mainly concerned with avoiding punishment or following rules when it is to their own advantage. At the **conventional level** of moral reasoning, Stages 3 and 4, people care about other people. They think that morality consists of following rules and conventions such as duty to the family, marriage vows, and country. The moral reasoning of children and adolescents from nine to nineteen is most often at this level. Stages 5 and 6 represent the highest level of moral reasoning, which Kohlberg called the **postconventional level** because it occurs after conventional reasoning. Moral judgments at this level are based on personal standards or universal principles of justice, equality, and respect for human life, not just demands of authority figures or society. People who have reached

this level view rules and laws as arbitrary but respect them because they protect human welfare. They believe that individual rights sometimes justify violating laws that have become destructive. People do not usually reach this level until sometime in young adulthood—if at all. Studies of Kohlberg's stages have generally supported the sequence he proposed (Turiel, 2006).

Limitations of Kohlberg's Stages

Do Kohlberg's stages appear across cultures? In general, yes. Forty-five studies in twenty-seven cultures from Alaska to Zambia showed that people do tend to make upward progress through Kohlberg's stages, without reversals, although Stages 5 and 6 did not always appear (Gibbs et al., 2007; Snarey & Hooker, 2006; Turiel, 2006). Further, the moral judgments made in some cultures do not always fit neatly into Kohlberg's stages. For example, some people in collectivist cultures, such as Papua New Guinea, Taiwan, and Israeli kibbutzim, explained their answers to moral dilemmas by pointing to the importance of the community. And people in India included in their moral reasoning the importance of acting in accordance with one's caste (social class) and with maintaining personal purity (Shweder et al., 1994). As in other areas of cognitive development, culture plays a significant role in shaping moral judgments (Abarbanell & Hauser, 2010; Rai & Fiske, 2011).

Gender may also play a role. Carol Gilligan (1982, 1993) suggested that Kohlberg's research documented mainly the abstract, impersonal concept of justice typically seen in males. When Gilligan asked people about moral conflicts, the majority of men focused on justice, but only half of the women did. The other half focused on caring. This finding supports Gilligan's belief that for North American women, the moral ideal is to protect enduring relationships and fulfill human needs. This gender difference has not been found consistently, however (Jaffee & Hyde, 2000). In fact, it appears that men and women sometimes use either approach to moral reasoning (Johnston, 1988). The tendency for women to focus on caring more than men do and for men to focus on justice more than women do appears most clearly when they resolve real-life moral issues that they have personally experienced (Jaffee & Hyde, 2000). However, when asked about hypothetical moral dilemmas, there is no substantial difference in how men and women reason (Jaffee & Hyde, 2000; Walker, 2006).

Taken together, research in different countries shows that moral ideals are neither absolute nor universal. Moral development is apparently an adaptation to the moral world and the specific situations in which people find themselves. Formal operational reasoning may be necessary for people to reach the highest level of moral reasoning, but formal operational reasoning alone is not enough. To some extent, at the highest levels, moral reasoning is a product of culture and history, of situations, and of people's emotions and goals in those situations (e.g., Almås et al., 2010; Amit & Greene, 2012; Feinberg et al., 2012; Hussar & Horvath, 2011; Teper, Inzlicht, & Page-Gould, 2011).

ADULTHOOD

What developmental changes occur in adulthood?

Development does not end at adolescence. Adults, too, go through transitions and experience physical, cognitive, and social changes. It has been suggested that adulthood emerges as early as age eighteen (Arnett, 2000), but for our purposes, adulthood can be divided into three periods: *early adulthood* (ages twenty to thirty-nine), *middle adulthood* (ages forty to sixty-five), and *late adulthood* (beyond age sixty-five).

Physical Changes

In early adulthood, physical growth continues. Shoulder width, height, and chest size increase, and people continue to develop athletic abilities. By their mid-thirties, nearly everyone shows some hearing impairment, but for most people, the years of early adulthood are the prime of life.

In middle adulthood, physical changes slowly emerge. The most common involve the further loss of sensory sharpness (Fozard et al., 1977). People become less sensitive to light, less accurate at perceiving differences in distance, and slower and less able at seeing details. Increased farsightedness is common among people in their forties, so they may need reading glasses. By their early fifties, women usually experience **menopause**, the shutdown of reproductive capability. Estrogen and progesterone levels drop, and the menstrual cycle eventually ceases.

Most people are well into late adulthood before body functions show noticeable impairment. However, inside the body, bone mass dwindles. Men shrink about an inch in height and women about two inches as their posture changes and cartilage disks between the spinal vertebrae thins. Older adults tend to go to sleep earlier but may awaken more often through the night to use the bathroom (Park et al., 2002). Changes in the walls of arteries may lead to heart disease. The digestive system becomes less efficient. Both digestive disorders and heart disease sometimes result from problems of diet—too little fluid, too little fiber, too much fat—and inactivity. In addition, the brain shrinks. The flow of blood to the brain slows. As in earlier years, many of these changes can be delayed or diminished by a healthy diet and exercise (Brach et al., 2003; Larson et al., 2006).

Cognitive Changes

Adulthood is marked by increases as well as decreases in cognitive abilities. Reaction times become slower and more variable (Deary & Der, 2005a), and although abilities that involve intensive information processing begin to decline in early adulthood, those that depend on accumulated knowledge and experience increase and don't begin to decline until old age, and some individuals never experience this decline. In fact, older adults may function as well as or better than younger adults in situations that tap their long-term memories and well-learned skills (Campbell, Hasher, & Thomas, 2010; Worthy et al., 2011). The experienced teacher may deal with an unruly child more skillfully than the new teacher, and the senior lawyer may understand the implications of a new law better than the recent graduate. Their years of accumulating and organizing information can make older adults practiced, skillful, and wise.

Early and Middle Adulthood

Until age sixty at least, important cognitive abilities improve. During this period, adults do better on tests of vocabulary, comprehension, and general knowledge—especially if they use these abilities in their daily lives or engage in enriching activities such as travel or reading (Park, 2001). Young and middle-aged adults learn new information and new skills and remember old information and hone old skills. In fact, it is in their forties through their early sixties that people tend to put in the best performance of their lives on complex mental tasks such as reasoning, verbal memory, and vocabulary (Schaie & Willis, 2010).

The nature of thought may also change during adulthood. Adult thought is often more complex and adaptive than adolescent thought (Labouvie-Vief, 1992). Unlike adolescents, adults more often see both possibilities and problems in a course of action—in deciding whether to start a new business, back a political candidate, move to a new city, or change jobs. Middle-aged adults are more expert than adolescents or young adults at making rational decisions and at relating logic and abstractions to actions, emotions, social issues, and personal relationships (Tversky & Kahneman, 1981). As they appreciate these relationships, their thought becomes more global, more concerned with broad moral and practical issues (Labouvie-Vief, 1982). It has been suggested that this kind of thinking reflects a stage of cognitive development that goes beyond Piaget's formal operational period (Lutz & Sternberg, 1999). In this period, people's thinking becomes *dialectical*, which means they understand that knowledge is relative, not absolute. They realize that what is seen as wise today might have been thought foolish in the past. They see life's contradictions as an inevitable part of reality, and tend to weigh solutions rather than just accepting the first one that springs to mind (Grossmann et al., 2010).

menopause The cessation of a woman's reproductive capacity.

Late Adulthood

After the age of sixty-five or so, some intellectual abilities decline noticeably (Verhaeghen, 2013). Generally, these are abilities that require intense mental effort, such as rapid and flexible manipulation of ideas and symbols, and active thinking and reasoning (Baltes, 1994; Bugg et al., 2006; Gilmore, Spinks, & Thomas, 2006; see Figure 11.7). Older adults do just as well as younger ones at tasks they know well, such as naming familiar objects (Radvansky, 1999). But, when doing an unfamiliar task or solving a new complex problem, older adults are generally slower and less effective than younger ones (Craik & Rabinowitz, 1984). When faced with complex problems, older people apparently suffer from having too much information to sift through (Gazzaley et al., 2005). They have trouble considering, choosing, and executing solutions (Peters et al., 2007). As people age, they grow less efficient at organizing the elements of a problem and at holding and mentally manipulating more than one idea at a time. They have difficulty doing tasks that require them to divide their attention between two activities and are slower at shifting their attention back and forth between those activities (Verhaeghen, 2011; Waslyshyn, Verhaeghen, & Sliwinski, 2011). If older adults have enough time, though, and if they can separate the two activities and choose appropriate problem-solving strategies, they can perform as well as younger adults (Hawkins, Kramer, & Capaldi, 1993; Lemaire, 2010).

Usually, the loss of intellectual abilities is slow and need not cause severe problems (Bashore & Ridderinkhof, 2002). The memory difficulties often seen among older adults relate more to *episodic memory* (e.g., remembering what they had for lunch yesterday) than to *semantic memory* (remembering general information, such as the capital of Italy) (Mousavi-Nasab et al., 2012; Nilsson, 1996). In other words, everyday abilities that involve verbal processes are likely to remain intact into advanced old age (Freedman, Aykan, & Martin, 2001; Schaie & Willis, 2010). There is one way, though, in which older adults' declining memories can have negative effects: They may be more likely than younger adults to recall false information as being true (Schmitz, Dehon, & Peigneux, 2013), making some of them prone to victimization by scam artists. So the more warnings they hear about a false medical claim—such as that shark cartilage supposedly cures arthritis—the more familiar it becomes, and the more likely they are to believe it. As described in the chapter on memory, younger people are also vulnerable to memory distortions, but they are more likely to remember that false information is false, even when it is familiar.

The decline in cognitive abilities in old age, as well as the rate of that decline, is partly due to genetics (Finkel et al., 2009; Kremen & Lyons, 2011; Reynolds et al., 2005), but

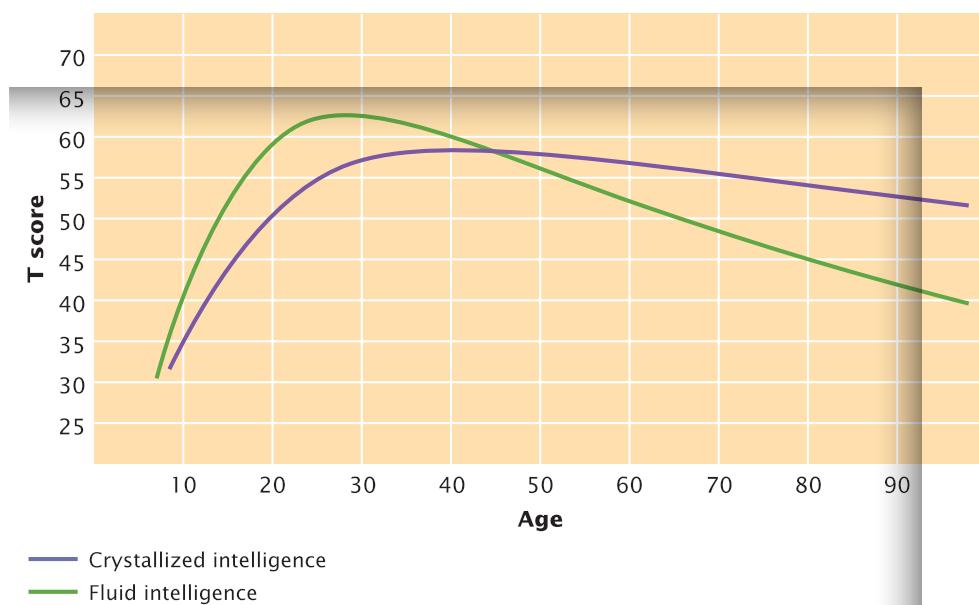


FIGURE 11.7
Mental Abilities over the Life Span

Mental abilities collectively known as "fluid" intelligence—speed and accuracy of information processing, for example—begin to decline quite early in adult life (Tucker-Drob, 2011). Changes in these biologically based aspects of thinking are usually not noticeable until late adulthood, however. "Crystallized" abilities learned over a lifetime—such as reading, writing, comprehension of language, and professional skills—decline too, but later and at a slower pace (Finkel et al., 2007; Li et al., 2004).



Staying Alert, Staying Active, Staying Alive

Sisters Alcantara, Claverine, and Nicolette of the School Sisters of Notre Dame convent were in their eighties or nineties when this photo was taken. They stayed alert by reading, solving puzzles, playing cards, and participating in vocabulary quizzes. The nuns at this convent are participating in a study of aging and the brain.

Steve Liss/Time & Life Pictures/Getty Images

other factors are important too. The risk of cognitive decline is significantly lower for people who are healthy and psychologically flexible and who have a high level of education, income, and occupation. Cognitive decline is slower among those who eat a healthy diet (Lourida et al., 2013; Morris et al., 2006), had a lifetime of mentally stimulating activities (Vemuri et al., 2014), live with mentally able spouses or companions (Chodosh et al., 2002), and had high IQ and activity levels in adolescence (Morris et al., 2006; Yaffe et al., 2009). Continued mental exercise—such as doing puzzles, painting, and having intellectually stimulating conversations with friends—can also help older adults think and remember effectively and creatively (e.g., Wilson et al., 2012). Practice at memory and other information-processing tasks may even lead to some improvement in skills that had been impaired by old age and disuse (Gross & Rebok, 2011; Kelly et al., 2014). Maintaining physical fitness through dancing or other forms of aerobic exercise has been

associated with better maintenance of skills on a variety of mental tasks, including those involving reaction time, reasoning, and divided attention (Baker et al., 2010; Kelly et al., 2014; Smith et al., 2010). And a life full of organized activities and opportunities to interact with lots of different people—not just family members—seems best for preventing decline in cognitive abilities (Hertzog et al., 2009; Keller-Cohen et al., 2004).

A major threat to cognitive abilities in late adulthood is dementia, and the most common cause is from Alzheimer's disease (Oboudiyat et al., 2013). As the disease progresses, parts of the brain deteriorate, leaving even the brightest minds dysfunctional (Defina et al., 2013). People with Alzheimer's may become emotionally flat, less oriented, and mentally vacant (Dillon et al., 2013). They usually die about three to seven years after being diagnosed (Todd et al., 2013). The age of onset and rate of decline may depend on several factors (Tejada-Vera, 2013), such as intelligence (Fritsch et al., 2005), gender (Wilson, Scherr, et al., 2007), education (Wilson, Scherr, et al., 2007), vulnerability to stress (Wilson et al., 2011), physical activity (Buchman et al., 2012), and vascular health (Reitz et al., 2010). For reasons still not clear, women tend to deteriorate more slowly than men (Mielke, Vemuri, & Rocca, 2014).

Social Changes

Adulthood is a time when changes occur in social relationships and positions. These changes do not come in neat, predictable stages but instead follow various paths, depending on individual experiences. Transitions—such as divorcing, being fired, going back to school, remarrying, losing a spouse to death, being hospitalized, getting arrested, moving back home, or retiring—are just a few of the turning points that can redirect a person's life path and lead to changes in personality (Caspi & Shiner, 2006; Roberts, Nelson, & Kohnen, 2002).

Early Adulthood: Work, Marriage, and Parenthood

Men and women in Western cultures usually enter a period of *emerging adulthood* in their twenties. When asked, "Do you feel that you have reached adulthood?" the majority of individuals of this age respond with the ambiguous "in some ways yes, in some ways no" (Arnett & Schwab, 2012). During this time, people explore life's possibilities through education, dating, and travel before they settle into stable adult roles and responsibilities (Arnett, 2013). They decide on a job and become preoccupied with careers (Srivastava et al., 2003). They also become more agreeable—warm, generous, and helpful (Srivastava et al., 2003); more controlled and confident; more socially dominant, conscientious, and emotionally stable; and less angry and alienated (Roberts & Mroczek, 2008). Still, by age twenty-five, about 20 percent of young adults still live with their parents, and just under half are still financially dependent (Cohen et al., 2003). Many young adults in their twenties also become more concerned with romantic love. Having reached the sixth of Erikson's stages of

psychosocial development listed in Table 11.2 (intimacy versus isolation), they begin to focus on forming mature relationships based on sexual intimacy, friendship, or mutual intellectual stimulation. The result may be marriage or another kind of committed relationship.

Just how willing and able people are to make intimate commitments may depend on their earlier attachment relationships (Birnbaum et al., 2006; Nosko et al., 2011; Oriña et al., 2011). Young adults' views of intimate relationships parallel the patterns of infant attachment that we described earlier (Broussard & Cassidy, 2010; Campbell et al., 2005). If their view reflects a secure attachment, they tend to feel valued and worthy of support and affection; they develop closeness easily. Their relationships are characterized by joy, trust, and commitment. If their view reflects an insecure attachment, however, they tend to be preoccupied with relationships and may feel misunderstood, underappreciated, and worried about being abandoned. Their relationships are often negative, obsessive, and jealous. Alternatively, they may be aloof and unable to trust or to commit themselves to a partner; they may be more prone to infidelity (DeWall et al., 2011). Overall, young adults whose parents have been accepting and supportive tend to develop warm and supportive romantic relationships (Hatton et al., 2009; Salvatore et al., 2011).

For many young adults, becoming a parent marks entry into a major new developmental phase (Palkovitz, Copes, & Woolfolk, 2001). This milestone may come earlier for young adults from lower income backgrounds, who are more likely to be in full-time jobs and less likely to live at home (Cohen et al., 2003). Often, satisfaction with marriage or partnership declines once a baby is born (Doss et al., 2009; Gilbert, 2006), and nearly half of all marriages break under the strain (National Center for Health Statistics, 2011). Young mothers may feel especially dissatisfied—particularly if they resent the constraints infants bring, if they see careers as important, if infants are temperamentally difficult, if partnerships are not strong, or if partners are unsupportive (Cowan & Cowan, 2009; Hogan & Msall, 2002; Jokela, 2010). When a father does not do his share of child care, both mothers and fathers are dissatisfied (Levy-Shiff, 1994). The ability of young parents to provide adequate care for a baby is related to their own attachment histories. New mothers whose attachments to their own mothers were secure tend to be more responsive to their infants, and the infants, in turn, are more likely to develop secure attachments to them (Adam, Gunnar, & Tanaka, 2004; Behrens, Hesse, & Main, 2007).

The challenges of young adulthood are complicated by the nature of family life today (Halpern, 2005; Howe, 2012). In the mid- to late twentieth century, about half of North American households consisted of married couples in their twenties and thirties—a breadwinner husband and a homemaker wife—raising at least two children together. This description now applies to only about one-fifth of households (Lofquist et al., 2012). Today, more people live together without getting married (Fry & Cohn, 2011); parents are older because young adults delay marriage and wait longer to have children. Many become parents without marrying (Hertz, 2006). About 40 percent of births are to unmarried women (Child Trends, 2011). Most of these women become pregnant “the old-fashioned way,” but some take advantage of technological advances that allow them to conceive through in vitro fertilization (Hahn & DiPietro, 2001; Parke et al., 2012). Many gay men and lesbians are becoming parents too. Some estimates suggest that at least 4 million families in the United States are headed by openly gay or lesbian adults who became parents by retaining custody of children born in a previous heterosexual marriage, by adopting children, or by having children through artificial insemination or surrogacy (Goldberg, 2010; Patterson, 2002).

Whether homosexual or heterosexual, the 60 percent of mothers who hold full-time jobs outside the home often find demands of children and career pulling them in opposite directions. Devotion to jobs leaves many mothers with guilt about spending too little time with their children (Booth et al., 2002), but placing too much emphasis on home life may reduce their productivity at work and threaten their advancement. This stressful balancing act can lead to anxiety, frustration, and conflicts at home and on the job. It affects fathers too. Husbands of employed women are more involved in child care (Pleck, 2004) and can



The “Sandwich” Generation

During their midlife transition, many people feel “sandwiched” between generations—pressured by the social, emotional, and financial needs of their children on one side and the needs of their aging parents on the other.

Fuse/Getty Images

be effective parents (Parke, 2002), but mothers still do most child care and housework (Coltrane & Adams, 2008).

Nearly half of all marriages in the United States end in divorce, creating yet another set of challenges for adults (Clarke-Stewart & Brentano, 2006; U.S. Census Bureau, 2012). People who divorce face many unanticipated stressors, including money problems, changes in living circumstances and working hours, loneliness, anxiety, and, for custodial parents, a dramatic increase in housework and child-care tasks (Amato, 2010; Clarke-Stewart & Brentano, 2006). In short, the changes seen in families and family life over the past several decades have made it more challenging than ever to successfully navigate the years of early adulthood.

Middle Adulthood: Reappraising Priorities

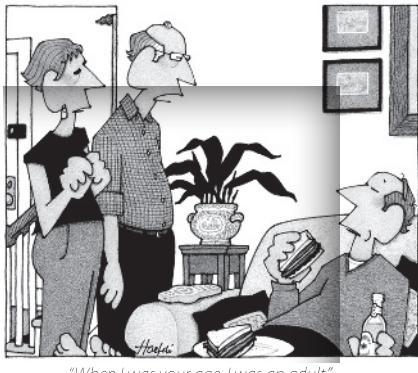
Around age forty, people go through a *midlife transition* during which they may rethink and modify their lives. Many feel invigorated and liberated; some may feel upset and have a “midlife crisis” (Beck, 1992; Levinson et al., 1978). The contrast between youth and middle age may be especially upsetting for men who matured early in adolescence and were sociable and athletic rather than intellectual (Block, 1971). Women who chose a career over a family may hear a biological clock ticking out their last childbearing years. Women who have had children, however, become more independent and confident and more oriented toward achievement and events outside the family (Helson & Moane, 1987). For both men and women, the emerging sexuality of teenage children, an empty nest as children leave home, or the declining health of a parent may precipitate a crisis.

Following the midlife transition, the middle years of adulthood often bring satisfaction and happiness (Mroczek & Spiro, 2005). Many people become concerned with producing something to outlast them (Sheldon & Kasser, 2001; Zucker, Ostrove, & Stewart, 2002). Erikson called this concern a crisis of **generativity** because people focus on producing or generating something. Making this kind of social investment tends to be associated with better adult adjustment (Snarey, 1994; Wilt et al., 2010). If people do not resolve this crisis, he suggested, they stagnate.

In their fifties, most people become grandparents (Smith & Drew, 2002), though they may find it hard to see themselves as no longer young (Karp, 1991). Recent trends toward decreased family size, longer life expectancy, and the rise of single-parent families and maternal employment increase the potential for grandparents to play larger roles in the lives of their grandchildren (Dunifon, 2013). But spending lots of time caring for young grandchildren can be stressful for some at this age, and may increase depression and reduce life satisfaction (Hayslip, King & Jooste, 2008; Lee, Colditz et al., 2003). Overall, the degree of happiness and healthiness people experience during middle adulthood depends on how much control they feel they have over their work, finances, marriages, children, and sex lives as well as on their personality characteristics, how many years of education they completed, and what kind of jobs they have (Azar, 1996; Griffin, Mroczek, & Spiro, 2006).

Late Adulthood: Retirement and Restriction

Most people between sixty-five and seventy-five years of age think of themselves as middle-aged, not old (Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008). They are active and influential politically and socially, and often physically vigorous. Ratings of life satisfaction and self-esteem are, on average, as high in old age as during any other period of adulthood (Charles, Mather, & Carstensen, 2003; Stone, 2010). Men and women who have been employed usually retire from their jobs during this period. They adjust most easily to retirement if they are prepared for it and view it as a choice (Adams & Rau, 2011; Moen et al., 2000; Swan, 1996). Retirement doesn’t need to mean giving up on life. In fact, in many ways the current generation of retirees has transformed retirement into a more active, engaged stage of life (Shultz & Wang, 2011).



“When I was your age, I was an adult.”

Most people in their sixties want their offspring to be independent, so they may have mixed feelings toward children who continue to need financial support during an extended period of “emerging adulthood” (Kloep & Hendry, 2010; Pillemer & Suitor, 2002).

William Haefeli/The New Yorker Collection/The Cartoon Bank

generativity The concern of adults in midlife with generating something enduring.



Still Going Strong

At the age of eighty-four, actor and Academy Award-winning director Clint Eastwood is a famous example of the many people whose late adulthood is healthy and vigorous. And he is not slowing down. His acting remains as riveting as ever, and the films he directs continue to attract huge audiences and critical acclaim.

Castle Rock Pictures/ZUMAPRESS/Newscom

Today, more people than ever are reaching old age. Those over age seventy-five constitute a group that is twenty-five times larger than it was a century ago. In fact, 100,000 people in the United States are over age 100, and the U.S. Census Bureau predicts that number will rise to 834,000 by 2050 (Volz, 2000). Old age is not necessarily a time of loneliness and desolation, but can be a time when people generally become more inward looking, cautious, and conforming (Reedy, 1983). It is a time when people develop coping strategies that increasingly take into account the limits of their control; people in this age group begin to accept what they cannot change, such as chronic health problems (Urry & Gross, 2010). One such coping strategy is to direct attention to positive thoughts, activities, and memories (Charles, Mather, & Carstensen, 2003; Mather et al., 2004). In fact, when older adults are asked to look at pictures of faces portraying various emotions, they spend more time looking at happy faces; people of college age look longer at fearful faces (Isaacowitz et al., 2006).

Compared to younger adults, older people remember a larger proportion of positive events (Brassen et al., 2012; Charles, 2011; Mather & Carstensen, 2005) and report less anger in response to interpersonal conflicts (Charles & Carstensen, 2008). In late adulthood, people find relationships more satisfying, supportive, and fulfilling than earlier in life. As they sense that time is running out, they value positive interactions and become selective about social partners. So although they interact with others less frequently, older adults enjoy these interactions more (Carstensen, 1997). As long as they have a network of at least three close relatives or friends, they are usually content (Litwin & Shiovitz-Ezra, 2006).

The many changes associated with adolescence and adulthood are summarized in “In Review: Milestones of Adolescence and Adulthood.”

Death and Dying

With the onset of old age, people become aware that death is approaching. They watch friends disappear. They may feel their health failing, their strength waning, and intellectual capabilities declining. A few years or a few months before death, people may experience a gradual decline or a sharper **terminal drop** in mental functioning (Gerstorf et al., 2011; MacDonald, Hultsch, & Dixon, 2011).

The awareness of impending death brings about the last psychological crisis, according to Erikson’s theory. During this stage, people evaluate their lives and accomplishments and see them as meaningful (leading to a feeling of integrity) or meaningless (leading to a feeling of despair). They tend to become more philosophical and reflective. They attempt to put their lives into perspective. They revisit old memories, resolve past conflicts, and integrate past events. They may also become more interested in the religious and spiritual side of life. This “life review” may trigger anxiety, regret, guilt, despair, even suicide (Anderson & Conwell, 2002). But it may also help people face their own deaths and the deaths of others with a feeling of peace and acceptance (Steinhauser et al., 2008; Torges, Stewart, & Nolen-Hoeksema, 2008).

Even the actual confrontation with death does not have to bring despair and depression. When death finally is imminent, old people strive for a death with dignity, love, affection, physical contact, and no pain (Schulz, 1978). As they think about death, they are comforted by their religious faith, their achievements, and the love of their friends and family.

Longevity

Facing death with dignity and openness helps us complete the life cycle with meaningfulness, but most of us want to live as long as possible. How can we do so? Much of what gives long life may be genetic (Chung et al., 2010; Dykert et al., 2012) and gender-related. Women live longer than men, on average. Longevity is also related to personality traits such

terminal drop A sharp decline in mental functioning that tends to occur in late adulthood, a few months or years before death.

MILESTONES OF ADOLESCENCE AND ADULTHOOD

Age	Physical Changes	Cognitive Changes	Social Events and Psychological Changes
Early adolescence (11–15 years)	Puberty brings reproductive capacity and marked bodily changes.	Formal operations and principled moral reasoning become possible for the first time. (This occurs only for some people.)	Social and emotional changes result from growing sexual awareness; adolescents experience mood swings, physical changes, and conflicts with parents.
Late adolescence (16–19 years)	Physical growth continues.	Formal operations and principled moral reasoning become more likely.	An identity crisis accompanies graduation from high school.
Early adulthood (20–39 years)	Physical growth continues.	Increases continue in knowledge, problem-solving ability, and moral reasoning.	People choose a job and often a mate; they may become parents.
Middle adulthood (40–65 years)	Size and muscle mass decrease; fat increases; eyesight declines; reproductive capacity in women ends.	Thought becomes more complex, adaptive, and global.	Midlife transition may lead to change; for most, the middle years are satisfying.
Late adulthood (over 65 years)	Height decreases; organs become less efficient.	Reasoning, mathematical ability, comprehension, novel problem solving, and memory may decline.	Retirement requires adjustments; people look inward; awareness of death precipitates life review.

In Review Questions

1. The greatest threat to cognitive abilities in late adulthood is _____ disease.
2. Adolescents' _____ identity may be more defining than their national citizenship.
3. Not stealing because "I might get caught" reflects the _____ stage of moral reasoning.

as conscientiousness as a child (Friedman & Martin, 2011) and curiosity as an adult (Boyle et al., 2009; Swan & Carmelli, 1996). People with higher IQs and faster reaction times tend to live longer, too (Deary & Der, 2005b), as do those who typically experienced happiness, enthusiasm, contentment, and other forms of *positive affect* as adults (Carstensen et al., 2011; Ong, 2010; Pressman & Cohen, 2007). Having a sense of purpose in life is also associated with longer lifespans (Hill & Turiano, 2014). Certain age-related life events—such as whether women have children later in life or whether men have experienced hair loss—can act as environmental cues that affect people's perceptions of their ages and the aging process (Hsu, Chung, & Langer, 2010). In one study, adults who had more positive self-perceptions when they were in their fifties and sixties lived seven and a half years longer than those with less positive self-perceptions. This factor was more predictive of longevity than were health problems such as high blood pressure, high cholesterol, smoking, lack of exercise, or being overweight (Levy et al., 2002). Remaining more socially engaged and having a network of good friends, even more than close family ties, is also related to longer life (Giles et al., 2005; Poon, 2008; Shankar et al., 2011). Further, people live longer if they don't smoke, don't drink heavily, restrict caloric intake, engage in regular physical and mental exercise, and have a sense of control over life (Infurna, Gerstorf, & Zarit, 2011; Kahlbaugh et al., 2011; Poon, 2008; Sun et al., 2010). So eat your veggies, stay physically fit, and continue to think actively—not just to live longer later but also to live better now.

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of infantile amnesia illustrates just one way that the topic of this chapter, human development, is linked to the subfield of memory, which is discussed in the chapter on memory. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 11 Human Development



LINKAGES

What happens to our memories of infancy?



CHAPTER 6
Memory

How do we learn to speak?



CHAPTER 7
Thought and Language

Are childhood traits related to how long we live?



CHAPTER 12
Health, Stress, and Coping

SUMMARY

Developmental psychology is the study of the course and causes of systematic, sequential, age-related changes in mental abilities, social relationships, emotions, and moral understanding over the lifespan.

Exploring Human Development

What does "genetic influence" mean?

A central question in developmental psychology concerns the relative influences of nature and nurture. Gesell stressed nature in his theory of development, proposing that development is **maturation**—the natural unfolding of abilities with age. Watson took the opposite view, claiming that development is learning, as shaped by the external environment. In his theory of cognitive development, Piaget described how nature and nurture work together. Today we accept the notion that both nature and nurture affect development and ask not whether but how and to what extent each contributes. Research in behavioral genetics shows that complex traits, such as intelligence and personality, are influenced by many genes, as well as by many environmental factors.

Beginnings

Why should pregnant women stay away from tobacco and alcohol?

Development begins with the union of an ovum and a sperm to form a zygote, which develops into an **embryo**. **Genes**, which consist of DNA (**deoxyribonucleic acid**), make up the **chromosomes** that are in each body cell. The embryonic stage is a **critical period** for development, a time when certain organs must develop properly or they never will. The development of organs at this stage is permanently affected by harmful **teratogens** such as tobacco, alcohol, or other drugs. After the embryo develops into a **fetus**, adverse conditions may harm the infant's size, behavior, intelligence, or health. Babies born to women who drink heavily are at risk for **fetal alcohol syndrome**.

Newborns have limited but effective senses of vision, hearing, taste, and smell. They exhibit many **reflexes**—swift, automatic responses to external stimuli. Motor development proceeds as the nervous system matures and muscles grow and as the infant experiments with and selects the most efficient movement patterns.

Infancy and Childhood: Cognitive Development

How do babies think?

Cognitive development refers to the development of thinking, knowing, and remembering. According to Piaget, **schemas** are modified through the complementary processes of **assimilation** (fitting new objects or events into existing schemas) and **accommodation** (changing schemas when new objects will not fit existing schemas). During the **sensorimotor period**, infants progress from using only their senses and simple reflexes to forming mental representations of objects and actions. As a result, the child becomes capable of thinking about objects that are not present. The ability to recognize that objects continue to exist even when they are hidden from view is what Piaget called **object permanence**. During the **preoperational period**, children can use symbols, but they do not have the ability to think logically and rationally. Their understanding of the world is intuitive. When children develop the ability to think logically about concrete objects, they enter the period of **concrete operations**. At this time, they can solve simple problems and have a knowledge of **conservation**, recognizing that, for example, the amount of a substance is not altered when its shape changes. The period of **formal operations** begins in adolescence and allows thinking and logical reasoning about abstract ideas.

Today, developmental psychologists believe that new levels of cognition do not appear in sharply separated stages of global understanding but emerge more gradually, and that children's reasoning can be affected by factors such as task difficulty and degree of familiarity with the objects and language involved.

Psychologists who explain cognitive development in terms of the **information processing model** have documented age-related improvements in children's attention, their abilities to explore and focus on features of the environment, and their memories. "Infantile amnesia" leaves us with virtually no memory of events from before the age of three. Several explanations have been suggested, but this phenomenon is not yet fully understood.

The specific content of cognitive development, including the development of scripts, depends on the cultural context in which children live. How fast children develop cognitive abilities depends to some extent on how stimulating and supportive their environments are. Children growing up in poverty are likely to have delayed or impaired cognitive abilities.

Infancy and Childhood: Social and Emotional Development

How do infants become attached to their caregivers?

From the early months onward, infants and their caregivers respond to each other's emotional expressions. Most infants can be classified as having easy, difficult, or slow-to-warm-up **temperaments**. Whether they retain these temperamental styles depends to some extent on their parents' expectations and demands. According to **attachment theory**, infants form a deep, long-lasting emotional **attachment** to their mothers or other primary caregivers. Their **attachment behavior** may reflect secure or insecure attachment. The process of **socialization** begins as parents

teach their children the skills and rules needed in their culture, using **parenting styles** described as **authoritarian**, **permissive**, **authoritative**, or **uninvolved (rejecting-neglecting)**. Among European American parents, those with authoritative styles tend to have more competent and cooperative children. Patterns of parental socialization depend on cultural and other circumstances.

Over the childhood years, interactions with peers evolve into cooperative and competitive encounters; friendships become more important. Changes in children's relationships are based in part on their growing social competence. Children become increasingly able to interpret and understand social situations and emotional signals. They begin to express empathy and sympathy and to engage in the **self-regulation** of their emotions and behaviors. They also learn social rules and roles, including those related to gender. **Gender roles**, also known as **sex roles**, are based both on biological differences between the sexes and on implicit and explicit socialization by parents, teachers, and peers. Children who lead successful lives despite such adversities as family instability, child abuse, homelessness, poverty, or war are described as having **resilience**.

Adolescence

What threatens adolescents' self-esteem?

Adolescents undergo significant changes not only in size, shape, and physical capacity but also, typically, in their social lives, reasoning abilities, and views of themselves. **Puberty** brings about physical changes that lead to psychological changes. Early adolescence is a period of shaky self-esteem. It is also a time when conflict with parents is likely to arise and when closeness with friends and conformity to peer group norms are likely to emerge. Later adolescence focuses on finding an answer to the question, "Who am I?" Events such as graduating from high school and going to college challenge the adolescent's self-concept, precipitating an **identity crisis**. To resolve this crisis, the adolescent must develop an integrated self-image as a unique person, an image that often includes **ethnic identity**. **Moral development** progresses from **preconventional** to **conventional** and (possibly) **postconventional** levels. Principled moral judgment—shaped by gender and culture—becomes possible for the first time.

Adulthood

What developmental changes occur in adulthood?

Physical, cognitive, and social changes occur throughout adulthood. During middle adulthood, changes begin that include decreased sharpness of the senses, increased risk of heart disease, and declining fertility (**menopause** in women). Nevertheless, most people do not experience major health problems until late adulthood.

The cognitive changes that occur in early and middle adulthood are generally positive, including improvements in reasoning and problem-solving ability. In late adulthood, some intellectual abilities decline—especially those involved in tasks that are unfamiliar, complex, or difficult. Other abilities, such as recalling facts or making wise decisions, tend not to decline.

In their twenties, young adults make choices about occupations and form intimate commitments. By the end of their

thirties, they settle down and decide what is important. They become concerned with **generativity**—with producing something that will outlast them. Sometime around age forty, adults experience a midlife transition, which may or may not be a crisis. The forties and fifties are often a time of satisfaction. In their sixties, people contend with the issue of retirement. They generally become more inward looking, cautious, and conforming. In their seventies, eighties, and beyond, people confront their own mortality. They may become more philosophical and reflective as they review their lives. A few years or months before death,

many experience a sharp decline in mental functioning, known as **terminal drop**. Still, they strive for a death with dignity, love, and no pain.

Death is inevitable, but healthy diets, exercise, conscientiousness and curiosity, and a sense of control over one's life are associated with living longer and happier lives. Older adults feel better and live longer if they receive attention from other people, maintain an open attitude toward new experiences, and keep their minds active.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your response against the Answer Key at the end of the book.

1. Ralph read an article that described intelligence as 50 percent heritable. Ralph can reasonably conclude that
 - a. half of his intelligence came from his genes and half from his environment.
 - b. about half of the variation in intelligence among groups of people can be accounted for by genetic influences.
 - c. about half of a person's intelligence can be changed by environmental influences.
 - d. about half the population got their intelligence from their genes alone.
2. When she became pregnant, Alyse was advised to quit smoking, but she didn't. As a result, her baby is more likely to be born _____.
 - a. mentally retarded
 - b. with facial deformities
 - c. underweight
 - d. with an irritable temperament
3. When Tyrone was a newborn, his parents brought him home from the hospital and always laid him on his back, especially at night. As Tyrone grew, he began to roll over, sit up, pull himself up on furniture, and walk. He skipped the crawling stage. Tyrone's physical development is the result of _____.
 - a. behavioral genetics alone
 - b. maturation alone
 - c. environmental influences alone
 - d. maturation and environmental influences
4. Keshawn is one month old. He is most likely to look longest at _____.
 - a. a nearby human face
 - b. small figures on the wallpaper
 - c. a ribbon hanging above his crib
 - d. colorful figures
5. At six months of age, Jacob still demonstrates the grasping and rooting reflexes. This could signal that Jacob
 - a. has advanced motor skills.
 - b. has muscles that cannot support his body.
 - c. has a problem with nervous system development.
 - d. needs less environmental stimulation than the average baby.
6. When two-year-old Jesse sees a scuba diver emerge on the beach, he says "Big fish!" According to Piaget, Jesse used _____ to try to understand the new stimulus of a scuba diver.
 - a. assimilation
 - b. accommodation
 - c. object permanence
 - d. conservation
7. Adriana is crying because her teddy bear, Boyd, has fallen off the table and landed face down. She insists that her mother put a bandage on Boyd's nose. According to Piaget's theory, Adriana is most likely in the stage of _____ cognitive development.
 - a. sensorimotor
 - b. preoperational
 - c. concrete operational
 - d. formal operational
8. Renee Baillargeon's research focused on infants' understanding about the mental states of other people and how those states affect behavior. Baillargeon found that infants
 - a. looked longer at "possible" events that they had experienced many times.
 - b. looked longer at events that violated their expectations about other people's beliefs.
 - c. do not yet have a "theory of mind" and thus are unable to anticipate what others might do.
 - d. can recognize the effects of people's true beliefs but are unable to recognize the effects of false beliefs.

- 9.** According to research on information processing and memory, when you try to recall your first birthday, you are likely to
- recall a general schema of “birthday” as well as details about your first one.
 - be unable to recall anything about your first birthday due to infantile amnesia.
 - recall information about your first birthday if you are shown pictures of yourself taken that day.
 - recall information about the birthday if you hear a tape recording of your party.
- 10.** Tara is a difficult baby. She is irritable, sleeps at irregular intervals, and cries at unpredictable times. According to research on temperament, compared to babies with other temperaments, Tara will be more likely to
- outgrow her difficult temperament and become an easier child.
 - remain difficult in childhood and may display aggressiveness.
 - develop a dependent relationship with her parents.
 - become independent and especially successful in school.
- 11.** Harlow’s research with infant monkeys and artificial mothers demonstrated that
- the monkeys became attached to the “mothers” that fed them.
 - the monkeys became attached to the “mothers” that provided contact comfort.
 - attachment is innate and not learned.
 - “mothering” is innate and not learned.
- 12.** When young Habib’s mother drops him off at the day care center, he always cries when she leaves. When his mother returns and lifts him up, Habib tries to squirm away. Habib is demonstrating a(n) _____ attachment to his mother.
- secure
 - anxious insecure
 - avoidant insecure
 - ambivalent insecure
- 13.** Sam and Alex are both age sixteen and want to drive to a rock concert in a big city that is five hours away. Sam’s parents explain that it is too dangerous for him to drive that distance and to be in a major city without an adult. They offer to drive him and Alex to the concert. Alex’s parents tell him to drive their car and stay in the city overnight if he wishes. According to Baumrind’s research, Sam’s parents are displaying a(n) _____ style of parenting, whereas Alex’s parents are displaying a(n) _____ style.
- authoritative; authoritarian
 - authoritarian; authoritative
 - authoritative; permissive
 - authoritarian; permissive
- 14.** Five-year-old Peng has a new preschool teacher who wants to get to know him, so she asks him “tell me about yourself.” Peng is most likely to say
- I am Asian.
 - I am Tommy’s friend.
 - I am the fastest runner in class.
 - I play basketball.
- 15.** Ludmilla recently graduated from high school but can’t decide whether to attend a local community college or work full time. She doesn’t know what career she would like to pursue, and she is also uncertain whether she should stay with her current boyfriend. According to Erikson, Ludmilla is most likely experiencing the psychosocial crisis characterized by _____,
- trust versus mistrust
 - initiative versus guilt
 - identity versus role confusion
 - integrity versus despair
- 16.** Louise is sixteen and having a difficult time with adolescence. She became sexually active two years ago and doesn’t worry about using condoms or other safe sex practices. Louise is most likely to
- hold conventional attitudes and values and feel ashamed of herself.
 - avoid smoking and drinking alcohol.
 - have average or better grades at school.
 - have parents who are not highly educated.
- 17.** Jeanine and Helen are in a drugstore when Jeanine suggests that they steal some candy. Helen says that they should not steal the candy because they might get caught and put into jail. According to Kohlberg’s theory, Helen is at the _____ stage of moral reasoning.
- preconventional
 - conventional
 - postconventional
 - universal
- 18.** In the past ten years Vernon has gained weight, especially around the middle. He also now needs glasses. If he is typical of most people his age, Vernon has most likely reached _____.
- adolescence
 - early adulthood
 - middle adulthood
 - late adulthood
- 19.** Verna is fifty years old. Based on developmental research, we would assume that Verna
- has less general knowledge than younger people.
 - has a more limited vocabulary than younger people.
 - understands that knowledge is relative, not absolute.
 - is experiencing a slow but steady decay of all of her cognitive skills.
- 20.** Patrice is eighty years old and has recently been unable to understand what she reads. She can’t make sense of her checkbook, even though she was once an expert accountant. Her health is deteriorating, and her strength is waning. Patrice is most likely experiencing _____.
- cognitive dissonance
 - terminal drop
 - the crisis of initiative versus guilt
 - androgyny

Health, Stress, and Coping



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Preview

People in North America are living longer than ever. In fact, those over 75 constitute the fastest-growing age group in the United States. Will you join them one day? To some extent, the answer lies in your genes, but how long you live is also determined in large measure by how you behave, how you think, and what stressors you face. Health care psychologists explore how illness and death are related to these behavioral, psychological, and social factors, and they apply their research to preventing illness and promoting health. They develop programs to help people make lifestyle changes that can lower their risk of illness and premature



Running for Your Life

Health psychologists have developed programs to help people increase exercise, stop smoking, eat healthier diets, and make other lifestyle changes that can lower their risk of illness and death. They have even helped bolster community blood supplies by finding ways to make blood donation less stressful (Bonk, France, & Taylor, 2001).

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death. And they study how stress affects people's mental and physical health. The immune system's response to stress is particularly important. In this chapter, you will learn about several kinds of stressors, how people respond to them, and the relationship between stress reactions and illness. You will also discover what you can do to protect your own health and change risky behaviors that may affect it.

In Bangor, Maine, where snow and ice have paralyzed the community, Angie's headache gets worse as her four-year-old daughter and six-year-old son start bickering again. The daycare center and elementary school are closed, so Angie must stay home from her job at the grocery store. She probably couldn't have gotten there anyway, because the buses have stopped running. During the latest storm, the power went out, and the house is now almost unbearably cold; the can of spaghetti Angie opens is nearly frozen. Worry begins to creep into her head: "If I can't work, how will I pay for rent and daycare?" Her parents have money problems, too, so they can't offer financial help, and her ex-husband rarely makes his child support payments. On top of everything else, Angie is coming down with the flu.

How do people manage such adversity, and what are its consequences for them? Psychologists who study questions such as these have established a specialty known as **health care psychology** (also called **health psychology**), "a field within psychology devoted to understanding psychological influence on how people stay healthy, why they become ill, and how they respond when they do get ill" (Taylor, 1999, p. 4).

HEALTH PSYCHOLOGY

What do health care psychologists do?

The themes underlying health care psychology date back to ancient times. For thousands of years, in many cultures around the world, people have believed that their mental state, their behavior, and their health are linked. Today, there is scientific evidence to support this belief (Antoni & Lutgendorf, 2007; Schneiderman, 2004; Taylor, 2002). Stress affects health through its impact on psychological and physical processes. Research has also associated anger, hostility, pessimism, depression, and hopelessness with physical illnesses. Traits such as optimism are associated with good health. Similarly, poor health has been linked to behavioral factors such as lack of adequate sleep or exercise, eating too much fat and sugar, sleep deprivation, smoking, and abuse of alcohol and other drugs (e.g., Mente et al., 2009; Pressman, Gallagher, & Lopez, 2013; van Dam et al., 2008). Good health has been associated with behaviors such as regular exercise and following medical advice.

Health psychology has become increasingly prominent in North America, in part because of changing patterns of illness. Until the middle of the twentieth century, acute infectious diseases such as influenza, tuberculosis, and pneumonia were the major causes of illness and death in the United States and Canada. With these deadly diseases now tamed, chronic illnesses—such as coronary heart disease, cancer, and diabetes—have joined stroke, accidents, and injury as leading causes of disability and death (Heron, 2007). Compared with acute diseases, these chronic diseases develop more slowly and are more strongly associated with people's psychological makeup, lifestyle, and environment (Centers for Disease Control and Prevention, 2008; see Table 12.1). The psychological and behavioral factors that contribute to illness can be changed by intervention programs that promote exercising, healthy eating, and quitting smoking (e.g., Kohn, Blakey, & Roper, 2014; Taylor et al., 2014). In fact, about half of the deaths in the United States remain due to preventable health-risk behaviors (Khot et al., 2003; Mokdad et al., 2004).

Yet as few as 3 percent of people in the United States follow a lifestyle that includes maintaining a healthy weight, getting regular exercise, eating a healthy diet, getting eight hours of sleep, and not smoking (Reeves & Rafferty, 2005). One goal of health psychology is to help people understand the role they can play in controlling their own health and life expectancy (Nash et al., 2003; Nicassio, Meyerowitz, & Kerns, 2004). For example,

health care psychology (health psychology) A field focused on understanding how psychological factors affect health and illness and which interventions help maintain health and combat illness.

TABLE 12.1 BEHAVIORS THAT AFFECT SOME OF THE LEADING CAUSES OF DEATH IN THE UNITED STATES

This table shows five of the leading causes of death in the United States today and behavioral factors that contribute to their development (Jemal et al., 2005; Kochanek et al., 2011).

Cause of Death	Excessive Alcohol Consumption	Tobacco Smoking	Unhealthy Diet	Inadequate Exercise	Inadequate Sleep
Heart disease	x	x	x	x	x
Cancer	x	x	x		
Chronic lung diseases		x			x
Stroke	x	x	x	?	x
Accidents and injury	x	x			x

Source: Data from National Vital Statistics Reports, Centers for Disease Control and Prevention (Kochanek, 2011).

health care psychologists have been active in educating people about the warning signs of cancer, heart disease, and other serious illnesses; encouraging them to engage in self-examinations; and emphasizing the importance of seeking medical attention while lifesaving treatment is still possible. Health care psychologists also study and help people understand the role stress plays in physical health and illness. And clinical health care psychologists help individuals cope as effectively as possible with cancer, diabetes, heart disease, and many other kinds of serious and chronic illness.

UNDERSTANDING STRESS AND STRESSORS

How do psychological stressors affect physical health?

You have probably heard that death and taxes are the only two things guaranteed in life. If there is a third, it surely must be stress. Stress is woven into the fabric of life. No matter how wealthy, powerful, attractive, or happy you might be, stress happens. It comes in many forms: a difficult exam, an automobile accident, a trauma of some kind, standing in a long line, reading about frightening world events, or just having a day when everything goes wrong. Some stress experiences, such as waiting to be with that special person, can be stimulating, motivating, and even desirable, but when circumstances begin to exceed our ability to cope with them, the result can be stress that creates physical, psychological, and behavioral problems. Stress in the workplace, for example, costs U.S. businesses more than \$150 billion each year due to employee absenteeism, reduced productivity, and health care costs (Chandola, Brunner, & Marmot, 2006; Schwartz, 2004).

Stress is the negative emotional and physiological process that occurs as individuals try to adjust to or deal with stressors. **Stressors**, in turn, are events and situations (such as exams or accidents) that disrupt or threaten to disrupt a person's daily functioning and sense of well-being. **Stress reactions** are the physical, psychological, and behavioral responses (such as nausea, anxiety, or avoidance) that occur in the face of stressors (Taylor, 2002).

Some of us are more strongly affected by stressors than others, and we may be more strongly affected on some occasions than on others. Why? As described in more detail later, several *mediating factors* influence the relationship between people and their

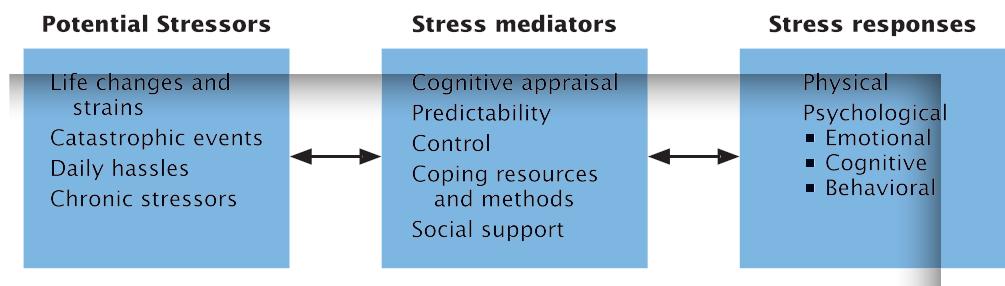
stress The process of adjusting to circumstances that disrupt or threaten to disrupt a person's daily functioning.

stressors Events or situations to which people must adjust.

stress reactions Physical and psychological responses to stressors.

FIGURE 12.1
The Process of Stress

Stressful events, stress reactions, and stress mediators are all important components of the stress process. Notice that the process involves many two-way relationships. For example, if a person has effective coping skills, stress responses will be less severe. Having milder stress responses can act as a “reward” that strengthens those skills. Further, as coping skills (such as refusing unreasonable demands) improve, certain stressors (such as a boss’s unreasonable demands) may become less frequent.



environments. These mediating factors include (1) the extent to which we can *predict* and *control* our stressors; (2) how we *interpret* the threat involved; (3) the *social support* we get; and (4) our *skills* for coping with stress. Mediating factors can either minimize or magnify a stressor’s impact. In other words, as shown in Figure 12.1, stress is not a specific event but a transaction between people and their environments. It is a *process* in which the nature and intensity of our responses depend on what stressors occur and how they are affected by factors such as the way we think about them and how much confidence we have in our coping skills and resources.

Psychological Stressors

Most stressors have both physical and psychological components. Because these components overlap, it’s often difficult to separate them for analysis. For example, students are challenged by psychological demands to do well in their courses as well as by physical fatigue resulting from a heavy load of classes and maybe a job and family responsibilities, too. So although we focus here on psychological stressors, remember that physical stressors almost always accompany them (Rios & Zautra, 2011).

Any event that forces a person to change or adapt can be a psychological stressor. Even pleasant events can be stressful. For example, a vacation is supposed to be relaxing and a wedding is supposed to be wonderful, but both can also be exhausting. And a promotion that brings higher pay can also bring new pressures (Schaubroeck, Jones, & Xie, 2001). Still, circumstances that are unpleasant, threatening, and difficult to cope with usually produce the most adverse psychological and physical effects (e.g., Kiecolt-Glaser et al., 2005). These circumstances include catastrophic events, life changes and strains, chronic stressors, and daily hassles.

Coping with Catastrophe

Catastrophic events such as terrorism, explosions, hurricanes, and plane crashes are stressors that can be psychologically devastating for victims, their families, and rescue workers.

Reuters/Marco Dormino/Minustah/Landov



Catastrophic events are sudden, unexpected, potentially life-threatening experiences or traumas. Physical or sexual assault, military combat, natural disasters, terrorist attacks, and accidents fall into this category (e.g., Besser et al., 2014; Grimm et al., 2014). *Life changes and strains* include divorce, illness in the family, difficulties at work, moving to a new house, and other circumstances that create demands to which people must adjust (see Table 12.2). *Chronic stressors*—those that continue over a long period of time—include such circumstances as living under the threat of terrorism, having a serious illness (or caring for someone who does), being unable to earn a decent income, living in a high-crime urban neighborhood, being the victim of discrimination, and even enduring years of academic pressure (e.g., Fuller-Rowell, Evans, & Ong, 2012; Lederbogen et al., 2011; Lovell, Moss, & Wetherell, 2012). Finally, *daily hassles* involve irritations, pressures, and annoyances that may not be major stressors by themselves but whose effects add up to become significant (Almeida, 2005; Evans & Wener, 2006). The frustrations of daily commuting in heavy traffic, for example, can become so intense for some drivers that they display a pattern of aggression called “road rage.”

Measuring Stressors

Which stressors are the most harmful? To study stress more precisely, psychologists have tried to measure the impact of particular stressors. In 1967, Thomas Holmes and Richard Rahe (pronounced “ray”) pioneered the effort to find a standard way of measuring the stress in a person’s life. Working on the assumption that both positive and negative changes produce stress, they asked a large number of people to rate—in terms of *life-change units (LCUs)*—the amount of change and demand for adjustment caused by events such as divorcing, being fired, retiring, losing a loved one, or becoming pregnant. On the basis of these ratings, Holmes and Rahe (1967) created the *Social Readjustment Rating Scale (SRRS)*. People taking the SRRS receive a stress score equal to the sum of the LCUs for all the stressful events they’ve recently experienced. Numerous studies have shown that people scoring high on the SRRS and other life-change scales are more likely to suffer physical illness, mental disorder, or other problems than those with lower scores (e.g., Monroe, Thase, & Simons, 1992).

TABLE 12.2 THE UNDERGRADUATE STRESS QUESTIONNAIRE

Here are some items from the Undergraduate Stress Questionnaire (Crandall, Priesler, & Aussprung, 1992), which asks students to indicate whether various stressors have occurred in their lives during the previous week. Has this stressful event happened to you at any time during the last week? If it has, please check the space next to it. If it has not, please leave it blank.

1. _____ Assignments in all classes due the same day
2. _____ Having roommate conflicts
3. _____ Lack of money
4. _____ Trying to decide on major
5. _____ Can’t understand your professor
6. _____ Stayed up late writing a paper
7. _____ Sat through a boring class
8. _____ Went into a test unprepared
9. _____ Parents getting divorced
10. _____ Incompetence at the registrar’s office

Source: Crandall, Priesler, & Aussprung (1992).



A Daily Hassle

Relatively minor daily hassles can combine to create significant physical and psychological stress responses. The frustrations of daily commuting in heavy traffic, for example, can become so intense for some drivers that they may display a pattern of anger and aggression called "road rage." Aggressive driving, including road rage, has been cited in as many as 56 percent of all fatal automobile accidents in the United States, and has resulted in thousands of injuries (AAA Foundation for Traffic Safety, 2009; Rathbone & Huckabee, 1999).

Jose Luis Pelaez Inc/Blend Images/Getty Images

Other researchers wondered, though, whether life changes alone tell the whole story about the impact of stressors. Accordingly, some investigators have used face-to-face interviews to more precisely measure stressors and their impact (e.g., Dohrenwend et al., 1993). Others developed scales such as the *Life Experiences Survey (LES)* (Sarason, Johnson, & Siegel, 1978), which measure not just which life events occurred but also people's perceptions of how positive or negative the events were and how well they were able to cope with the events. The LES also allows respondents to write in and rate any stressors they have experienced that are not on the printed list. This individualized approach can capture the differing impact and meaning that certain experiences might have for men compared with women and for members of various cultural groups. Divorce, for example, may have different meanings to people of different religious backgrounds. And members of some ethnic groups may experience stressors, such as prejudice and discrimination, that are not felt by other groups (e.g., Flores et al., 2010; Yip, Gee, & Takeuchi, 2008).

The timing of stressors matters, too; those that occur early in life can have especially enduring consequences. For example, experiencing the stress of poverty, trauma, or other adversities during early childhood is associated with an increased risk of developing heart disease, arthritis, certain cancers, and other health problems in adulthood, even for people who by then had achieved middle or upper class socioeconomic status (Chan et al., 2011; Rooks et al., 2012). These long-lasting effects occur partly because early life stressors affect the brain as well as the heart and the immune system, and may affect the early basic structuring of these systems in a way that sets the stage for poor stress-coping abilities later on in life (Mitchell et al., 2014; Taylor, 2010).

STRESS RESPONSES

How do people react to stressors?

Physical and psychological stress reactions often occur together, especially as stressors become more intense. Furthermore, one type of stress response can set off a stress response in another dimension. For example, a physical stress reaction such as mild chest pains might trigger the psychological stress response of worrying about a heart attack. Still, it's useful to consider each category of stress responses one at a time.

Physical Responses

If you have experienced a near-accident or some other sudden, frightening event, you know that the physical responses to stressors can include rapid breathing, increased heartbeat and blood pressure, sweating, and perhaps shakiness. These reactions make up a general pattern known as the **fight-flight reaction**. As described in the chapters on biological aspects of psychology and on motivation and emotion, the fight-flight reaction allows the body to be prepared either to face or to flee an immediate threat. Once a danger passes, fight-flight responses subside (Gump et al., 2005).

When stressors last longer or recovery from stressors is slow, however, a fight-flight reaction is just the start of a long sequence of events. Observation of animals and humans led Hans Selye (pronounced "SELL-yay") to suggest that this extended sequence of physical stress responses follows a consistent pattern. He called this sequence the **general adaptation syndrome**, or **GAS** (Selye, 1956, 1976). The GAS occurs in three stages (see Figure 12.2), and it is activated by efforts to adapt to any physical or psychological stressor.

The first stage, called the *alarm reaction*, involves a version of the fight-flight reaction. The alarm reaction to a mild stressor, such as an overheated room, might be no more than changes in heart rate, breathing, and sweating that help the body regulate its temperature. More severe stressors prompt more dramatic alarm reactions, rapidly mobilizing the body's adaptive energy, much as a burglar alarm alerts the police to take action (Kiecolt-Glaser et al., 1998).

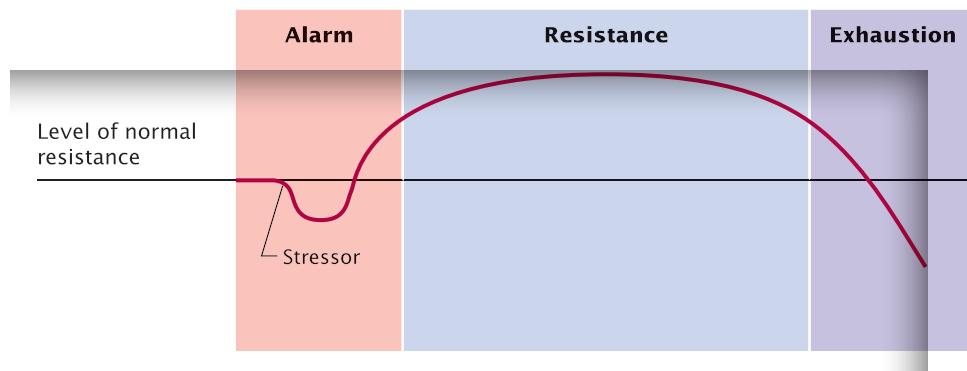
fight-flight reaction Physical reactions triggered by the sympathetic nervous system that prepare the body to fight or to run from a threatening situation.

general adaptation syndrome (GAS) A three-stage pattern of responses triggered by the effort to adapt to stressors.

FIGURE 12.2
The General Adaptation Syndrome

Hans Selye found that physical reactions to stressors include an initial alarm reaction followed by resistance and then exhaustion. During the alarm reaction, the body's resistance to stress temporarily drops below normal as it absorbs a stressor's initial impact. Resistance increases and then levels off in the resistance stage, but it ultimately declines if the exhaustion stage is reached.

Source: Adapted from Selye (1975).

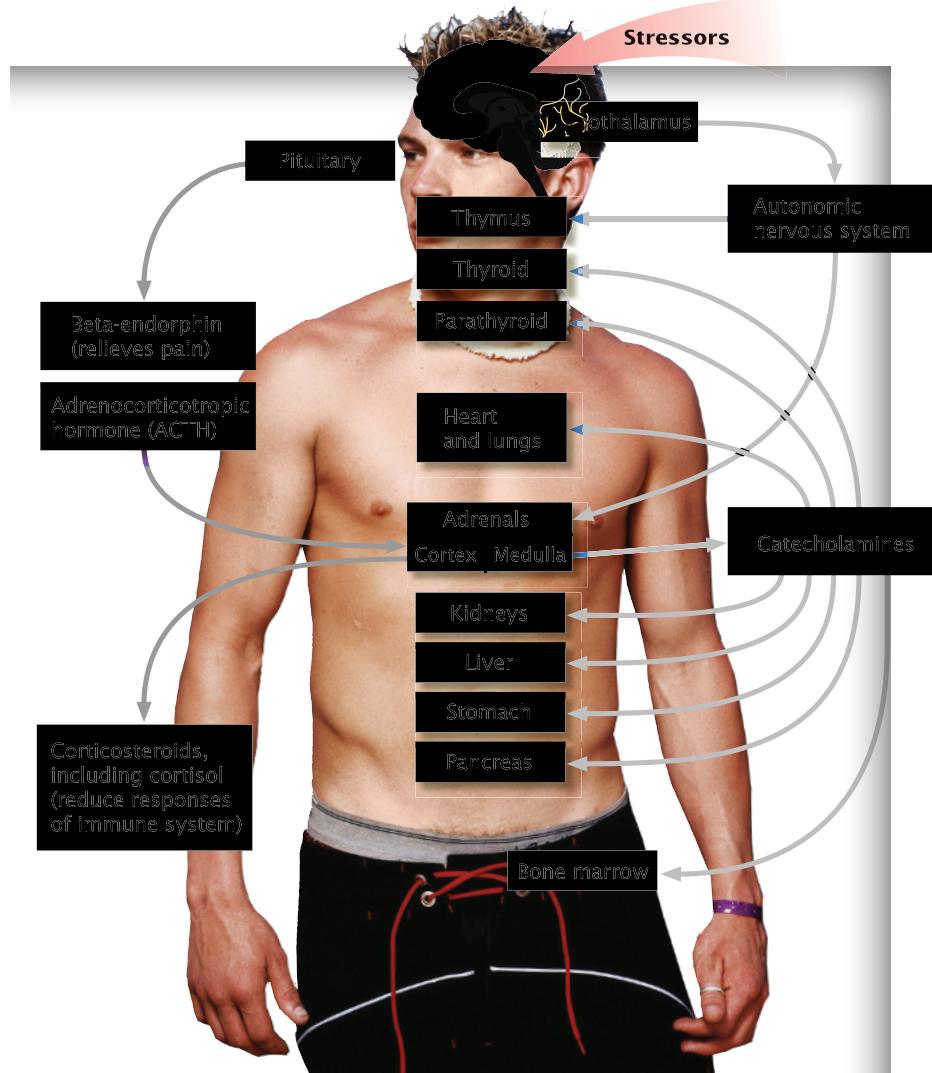


Alarm reactions are controlled by the sympathetic nervous system through interactions involving the brain, various body organs, and glands. These interactions make up the *sympatho-adreno-medullary (SAM) system*. As shown on the right side of Figure 12.3, stressors trigger a process that begins when the brain's hypothalamus activates the sympathetic branch of the autonomic nervous system (ANS), which stimulates the medulla (inner part) of the adrenal glands. The adrenals, in turn, secrete *catecholamines*

FIGURE 12.3
Organ Systems Involved in the General Adaptation Syndrome

Stressors produce a variety of physiological responses that begin in the brain and spread to organs throughout the body. For example, the pituitary gland triggers the release of painkilling endorphins. It also stimulates the release of corticosteroids, which help resist stress but also tend to suppress the immune system. Some of these substances may interact with sex hormones to create different physical stress responses and coping methods in men and women (Taylor, Klein et al., 2000; Taylor et al., 2006).

Michael Sharkey/Taxi/Getty Images



(pronounced “kat-uh-KOH-luh-meens”)—especially adrenaline and noradrenaline—which circulate in the bloodstream, affecting the liver, kidneys, heart, lungs, and other organs. This action causes increases in blood pressure, muscle tension, blood sugar, and pupil size, along with other physical changes that provide the energy and resources that may be needed to respond to stressors. Even brief exposure to a stressor may cause major changes in these coordinated regulatory body systems (Stoney et al., 2002).

As shown on the left side of Figure 12.3, stressors also activate the *hypothalamic-pituitary-adrenocortical (HPA) system*, in which the hypothalamus stimulates the pituitary gland in the brain. The pituitary, in turn, secretes hormones such as adrenocorticotropic hormone (ACTH). Among other things, ACTH stimulates the cortex (outer surface) of the adrenal glands to secrete *corticosteroids such as cortisol*; these hormones release the body’s energy supplies and fight excessive inflammation. Even little daily hassles can cause SAM activation and cortisol release (Stawski et al., 2013). The pituitary gland also triggers the release of *endorphins*, which act as natural painkillers.

Together, these stress systems generate the energy that may be needed to respond to an emergency. The more stressors there are and the longer they last, the more resources the body may need to spend in responding to them. If the stressors persist, the second stage of Selye’s GAS may occur. In this *resistance stage*, obvious signs of the initial alarm reaction fade as the body settles in to resist the stressor on a long-term basis. The drain on adaptive energy is less during the resistance stage compared with the alarm stage, but the body is still working hard to cope with stress.

This continued campaign of biochemical resistance is costly. It slowly but surely uses up the body’s reserves of adaptive resources. As this happens, the body enters the third GAS stage, the stage of *exhaustion*. In extreme cases, such as prolonged exposure to freezing temperatures, the result is death. More commonly, the exhaustion stage brings signs of physical wear and tear. Especially hard hit are organ systems that were weak to begin with or that were heavily involved in the resistance process. For example, if adrenaline and cortisol (which help fight stressors during the resistance stage) remain elevated for an extended time, the result can be damage to the heart and blood vessels; suppression of the body’s disease-fighting immune system; and vulnerability to illnesses such as heart disease, high blood pressure, arthritis, colds, and flu (e.g., Robles, Glaser, & Kiecolt-Glaser, 2005). Selye referred to illnesses caused or worsened by stressors as **diseases of adaptation**.

Psychological Responses

Selye’s widely influential model focused mainly on physiological aspects of stress responses. But stressors also create a variety of psychological responses, including changes in emotion and cognition (thinking) and accompanying changes in behavior.

Emotional Changes

The physical stress responses we have described are commonly accompanied by emotional stress responses. If someone pulls out a gun and demands your money, you will most likely have physiological reactions, such as a spike in heart rate, but you’ll also feel some strong emotion—probably fear, maybe anger. In describing stress, people tend to say, “I was angry and frustrated!” rather than “My heart rate increased and my blood pressure went up.” In other words, we tend to mention the emotional changes that stress may bring.

In most cases, emotional stress reactions fade soon after the stressors are gone or coped with effectively. Even severe emotional stress responses ease eventually. However, if stressors continue for a long time or if many of them occur in a short time, emotional stress reactions may persist. When people don’t have a chance to recover their emotional equilibrium, they feel tense, irritable, short-tempered, or anxious, and they may experience increasingly intense feelings of fatigue, depression, and hopelessness. These reactions can become severe enough to be diagnosed as major depressive disorder, generalized anxiety disorder, or other stress-related problems discussed in the chapter on psychological disorders.

diseases of adaptation Illnesses caused or worsened by stressors.

Cognitive Changes

In the busy, noisy intensive care unit of a London hospital, a doctor misplaced a decimal point while calculating the amount of morphine that a one-day-old premature baby should receive. The child died of an overdose (Davies, 1999). Reductions in the ability to concentrate, think clearly, or remember accurately are typical cognitive stress reactions (e.g., Liston, McEwen, & Casey, 2009; Morgan et al., 2006). These problems appear partly because of *ruminative thinking*, the repeated intrusion of thoughts about stressful events (Lyubomirsky & Nolen-Hoeksema, 1995). Ruminative thoughts about relationship problems, for example, can interfere with studying for a test. A related phenomenon is *catastrophizing*, which means dwelling on and overemphasizing the possible negative consequences of events. During exams, college students who are anxious about tests might say to themselves, “I’m falling behind” or “Everyone is doing better than I am.” As catastrophizing or ruminative thinking impairs memory and other aspects of cognitive functioning, resulting feelings of anxiety and other emotional arousal add to the total stress response, further hampering performance (Beilock et al., 2004).

Overarousal created by stressors can also interfere with our ability to adapt to new or difficult situations (Schwabe & Wolf, 2011) because one effect of overarousal is to narrow the scope of attention. When people don’t attend to the entire situation and don’t consider enough solutions to complex problems (Craske, 1999), they may make one or more of the problem-solving errors described in the chapter on thought and language. People under stress are more likely to cling to *mental sets*, which are well-learned (but not always efficient) approaches to problems. Stress may also intensify *functional fixedness*, the tendency to use objects for only one purpose. Victims of hotel fires, for example, sometimes die trapped in their rooms because in the stress of the moment it did not occur to them to use a piece of furniture to break open a window (Renner & Beversdorf, 2010).

Stressors may also impair decision making (Mather & Lighthall, 2012). Under stress, people who normally consider all aspects of a situation before making a decision may act impulsively and sometimes foolishly. High-pressure salespeople take advantage of this stress response by creating time-limited offers or by telling indecisive customers that others are waiting to buy the item they are considering (Cialdini, 2001).

Behavioral Responses

Clues about people’s physical and emotional stress reactions come from changes in how they look, act, or talk. Strained facial expressions, a shaky voice, tremors, and jumpiness are common behavioral stress responses.

Even more obvious behavioral stress responses appear as people try to escape or avoid stressors (Atalay & Meloy, 2011). They may turn to alcohol, overeat (especially high-fat “comfort” foods), begin or increase smoking, and either sleep too much or skimp on sleep

Stress for \$500, Alex

The negative effects of stress on memory, thinking, decision making, and other cognitive functions are often displayed by players on TV game shows such as *Jeopardy!*, *Who Wants to Be a Millionaire*, and *Survivor*. Under the intense pressure of time, competition, and the scrutiny of millions of viewers, contestants may make mistakes that seem ridiculous to those calmly watching at home.

Amanda Edwards/Getty Images Entertainment/
Getty Images



in favor of late-night socializing. These tactics may provide temporary relief but at the cost of negative health consequences (Cohen et al., 2009; Tsenkova, Boylan, & Ryff, 2013). In the face of severe or long-lasting stress, some people quit their jobs, drop out of school, or even attempt suicide. After the global economic downturn in 2008, for example, suicide rates went up around the world (Chang et al., 2013). Natural disasters are examples of particularly severe and sometimes long-lasting stressors that can challenge our coping skills (Musa et al., 2014). In the month after Hurricane Katrina struck the U.S. Gulf Coast in 2005, more than double the normal number of calls were placed from the affected area to the National Suicide Prevention Hotline, and stress-related mental health problems remained long after the storm's immediate effects abated (Kessler et al., 2008; Roberts et al., 2010). Aggression is another common behavioral response to stressors. All too often, this response is directed at members of one's own family (Hellmuth & McNulty, 2008; Polusny & Follette, 1995). So areas devastated by hurricanes and other natural disasters are likely to see not only an increase in suicides but also significant increases in reports of domestic violence (Curtis, Miller, & Berry, 2000). Even "everyday" stressors can tempt us to resort to escape or avoidance tactics. Unfortunately, as discussed in the chapter on learning, such behaviors deprive us of a chance to learn more adaptive ways of coping with stressful events and situations, including those typically encountered in college life (Cooper et al., 1992).

LINKAGES When do stress responses become mental disorders? (a link to Psychological Disorders)

STRESS AND PSYCHOLOGICAL DISORDERS

LINKAGES

Physical and psychological stress responses sometimes appear together in patterns known as *burnout* and *posttraumatic stress disorder*. **Burnout** is an increasingly intense pattern of physical and psychological dysfunction in response to a continuous flow of stressors or to chronic stress (Maslach, 2003). As burnout nears, previously reliable workers or once-attentive spouses become indifferent, disengaged, impulsive, or accident-prone. They miss work frequently, oversleep, perform their jobs poorly, abuse alcohol or other drugs, and become irritable, suspicious, withdrawn, and depressed (Beck et al., 2013; Taylor, 2002). Burnout is particularly common among those who do "people work," such as teachers, doctors, and nurses and those who perceive themselves as being treated unjustly by employers (Barnard & Curry, 2012; Dyrbye et al., 2014; Hoobler & Brass, 2006).

Posttraumatic stress disorder (PTSD) is a different pattern of severe negative reactions to a traumatic event. Among its characteristics are anxiety, irritability, jumpiness, inability to concentrate or work productively, sexual dysfunction, intrusive thoughts and images, and difficulty in social and family relationships. PTSD sufferers also experience sleep disturbances, intense startle responses to noise or other sudden stimuli, long-term suppression of their immune systems, and elevated risk of coronary heart disease (e.g., Hagenaars et al., 2010; Kubzansky et al., 2009; Rutkowski et al., 2010). In one study, children with PTSD due to a terrorist incident still showed elevated heart rate and blood pressure seven years later (Pfefferbaum et al., 2014). Neuroimaging studies reveal that PTSD symptoms are accompanied by noticeable changes in brain functioning and even in brain structure (Kitayama et al., 2005). The most common feature of PTSD is reexperiencing the trauma through nightmares or vivid memories. In rare cases, *flashbacks* occur in which the person behaves for minutes, hours, or days as if the trauma were occurring again.

Posttraumatic stress disorder is often associated with events such as war, rape, terrorism, natural disasters, assault, or abuse in childhood, but researchers believe that some PTSD symptoms can be triggered by any major stressor, such as a car accident, being stalked, or living in a community that is threatened by terrorism or serial killers (Correra et al., 2014; Diamond et al., 2010; Marshall, Miles, & Stewart, 2010; Schulden et al., 2006). PTSD usually appears immediately following a trauma, but all of its symptoms may not appear until weeks later (Andrews et al., 2007). Many people affected by PTSD require professional help, although some seem to recover without it (Bradley et al., 2005; Perkonigg et al., 2005). For most, improvement takes time; one summary analysis of research found that 56 percent of people who developed PTSD

(continued)

burnout A pattern of physical and psychological dysfunctions in response to continuous stressors.

posttraumatic stress disorder (PTSD) A pattern of adverse reactions following a traumatic event, commonly involving reexperiencing the event through nightmares or vivid memories.

Life Hanging in the Balance

Symptoms of burnout and posttraumatic stress disorder (PTSD) often plague firefighters, police officers, emergency medical personnel, and others who are repeatedly exposed to time pressure, trauma, danger, and other stressors (Fullerton, Ursano, & Wang, 2004; Perrin et al., 2007). PTSD can also occur following a single catastrophic event, such as the earthquake and tsunami that caused devastation in Japan in 2011.

Camera Press/Dan Chung/Guardian/Redux



continued to display symptoms forty months later (Morina et al., 2014). For nearly all, the support of family and friends is vital to recovery (Foa et al., 2005).

Not everyone who endures a trauma will go on to experience PTSD, even after severe trauma (Breslau et al., 2005). In fact, some people report enhanced psychological growth after surviving a trauma (Zoellner & Maercker, 2006). Health psychologists are working to discover what protective factors operate in these individuals and whether those factors can be strengthened through PTSD treatment and prevention programs (e.g., Cacioppo, Reis, & Zautra, 2011; Cornum et al., 2011; Shalev et al., 2012; Tedeschi & McNally, 2011).

Stress plays a role in the development of many other psychological disorders, including depression, certain anxiety disorders, and schizophrenia spectrum disorders (e.g., Cutrona et al., 2005). We emphasize this point in the chapter on psychological disorders, especially in relation to the *diathesis-stress model* of psychopathology. This model suggests that some people may be predisposed to develop certain disorders but that whether or not these disorders actually appear depends on the frequency, nature, and intensity of the stressors such people encounter.

STRESS MEDIATORS

Why doesn't everyone react to stressors in the same way?

The various ways that different people interact with particular stressors can be seen in many areas of life. The stress of combat, for example, is partly responsible for the errors in judgment and decision making that lead to “friendly fire” deaths and injuries in almost every military operation (Adler, 1993). But not everyone in combat makes these mistakes. Why not? And why does one individual survive and even thrive under the same circumstances that lead another to break down, give up, and burn out?

Answers may lie in *psychobiological models*, which examine the interaction of both psychological as well as biological factors in the stress process (Cyranowski et al., 2011; Folkman et al., 2000; Kidd, Hamer, & Steptoe, 2011; Suls & Rothman, 2004; Taylor, 2002). These models emphasize that (as shown in Figure 12.1) the impact of stressors depends not only on the actual stressors themselves but also on several important *mediating factors* (Bonanno, 2005; Kemeny, 2003).

How Stressors Are Perceived

As described in the chapter on sensation and perception, our view of the world depends partly on how we interpret data from our senses. Similarly, our physical and psychological reactions to stressors depend somewhat on how we think about them, a process known as

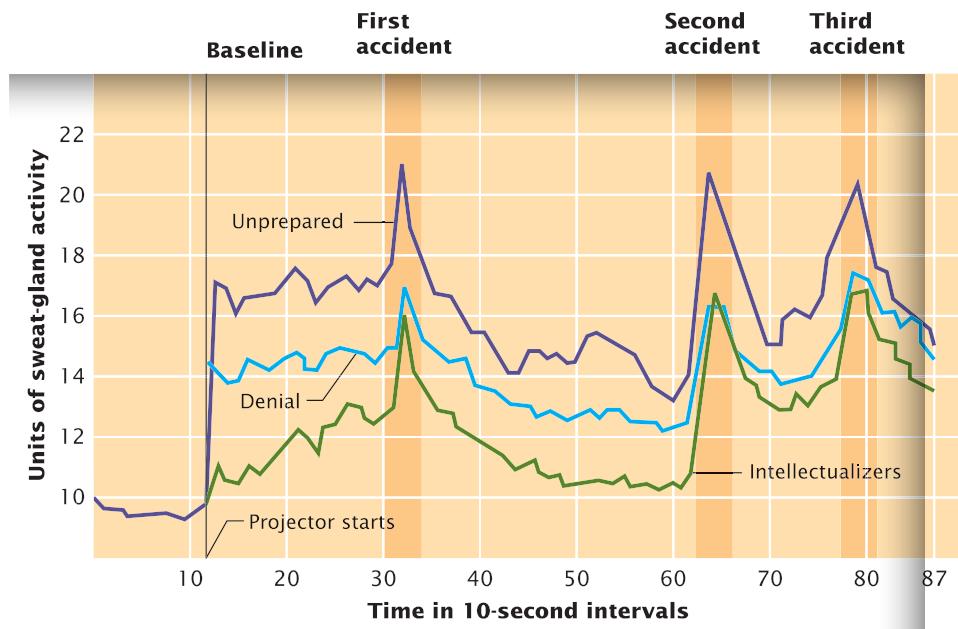
cognitive appraisal. A potential stressor usually has a stronger negative impact on people who perceive it as a threat than on people who see it as a challenge (Lazarus, 1999; Maddi & Khoshaba, 2005). This may be why people who are deeply engaged in and passionate about their stressful jobs are less likely than their coworkers to suffer burnout (Vallerand et al., 2010).

Evidence for the effects of cognitive factors on stress responses comes from surveys and experiments. In one of the first laboratory demonstrations of these effects, Richard Lazarus gave differing instructions to three groups of students who were about to watch a film showing bloody industrial accidents (Lazarus et al., 1965). One group (the “intellectualizers”) was told to remain mentally detached from the gruesome scenes; a second group (the “denial” group) was instructed to think of the scenes as unreal; and a third group (the “unprepared” group) was told nothing about the film. As Figure 12.4 shows, the intensity of physiological arousal during the film, as measured by sweat gland activity, depended on how the viewers were instructed to think about the film. The unprepared students were more upset than either of the other two groups. In a more recent study, students who were first trained to see the threatening aspects of information showed more emotional arousal to a stressful video than those who had been trained to see information as nonthreatening (Wilson et al., 2006). Similarly, physical and psychological symptoms associated with the stress of airport noise, of being diagnosed with a serious illness, of learning about toxins in local soil, or of living with terrorism threats are more common in people who engage in more catastrophic thinking about these problems (e.g., Bryant & Guthrie, 2005; Lerner et al., 2003; Speckhard, 2002). Those who hold a more optimistic outlook in general tend to show milder stress responses and better health outcomes (de Moor et al., 2006; Taylor et al., 2003).

The influence of cognitive factors is somewhat less important as stressors become extreme. For example, patients who have a sense of control over chronic pain are more likely than other patients to remain physically active, but this difference does not hold if the pain is severe (Jensen & Karoly, 1991). Still, even the impact of major stressors, such as a natural disaster or a divorce, may be less severe for those who think of them as challenges to be overcome. In other words, many stressful events are not inherently stressful; their impact depends partly on how people perceive them. An important part of this appraisal is the degree to which the stressors are perceived to be predictable and controllable, or at least manageable.

FIGURE 12.4
Cognitive Influences on Stress Responses

Richard Lazarus and his colleagues found that students' physiological stress reactions to a film showing bloody industrial accidents were affected by the way they thought about what they saw. Those who had been instructed to remain detached from the film (the “intellectualizers”) or to think of it as unreal (the “denial” group) were less upset—as measured by sweat gland activity—than those in an “unprepared” group. These results were among the first to show that people's cognitive appraisals of stressors can affect their responses to those stressors.



Predictability and Control

Why is the threat of terrorism so terrorizing? A key reason is because knowing that a stressor might occur but being uncertain whether or when it will occur tends to increase the stressor's impact (Lerner et al., 2003; Sorrentino & Roney, 2000). In other words, *unpredictable* stressors tend to have more impact than those that are predictable (Lazarus & Folkman, 1984; Pham, Taylor, & Seeman, 2001), especially when the stressors are intense and relatively brief. For example, people whose spouses have died suddenly tend to display more immediate disbelief, anxiety, and depression than those who have had weeks or months to prepare for the loss (Schulz et al., 2001; Swarte et al., 2003). Still, predictability does not provide total protection against stressors. Research with animals shows that predictable stressors can be even more damaging than unpredictable ones if they occur over long periods of time (Abbott, Schoen, & Badia, 1984).

The *perception of control* is also a powerful mediator of the effects of stressors. If people feel they have some control over stressors, those stressors usually have less impact (e.g., Johnson & Krueger, 2005; Smith et al., 2008). For example, studies of several thousand employees in the United States, Sweden, and the United Kingdom have found that those who felt they had little or no control over their work environment were more likely to suffer heart disease and other health problems than workers with a high degree of perceived control (Bosma et al., 1997; Cheng et al., 2000; Spector, 2002). And at many hospitals, it is now standard procedure to help patients manage or control the stress of emergency treatment or the side effects of surgery by providing preparatory information about what to expect during and after a medical procedure, teaching relaxation skills, and allowing patients to control the administration of their pain medication. These strategies have all been shown to help people heal faster and go home sooner (Broadbent et al., 2003; Chamberlin, 2000; Gordon et al., 2005).

Simply *believing* that a stressor is controllable (even if it isn't) can also reduce its impact. In one study, participants with panic disorder inhaled a mixture of oxygen and carbon dioxide that typically causes a panic attack (Sanderson, Rapee, & Barlow, 1989). Half the participants were led to believe (falsely) that they could control the concentration of the mixture. Compared with those who believed that they had no control, significantly fewer of the "in-control" participants experienced full-blown panic attacks during the session, and their panic symptoms were fewer and less severe.

People who feel they have no control over negative events appear especially prone to physical and psychological problems. They often experience feelings of helplessness and hopelessness that in turn may promote depression or other mental disorders (Sarin, Abela, & Auerbach, 2005; Whang et al., 2009). It's even been suggested that a perceived lack of control partly explains why people in lower socioeconomic groups are at somewhat elevated risk for early death (Stringhini et al., 2010; Trumebetta et al., 2010).

Coping Resources and Coping Methods

People usually suffer fewer ill effects from a stressor if they have adequate coping resources and effective coping methods. *Coping resources* include, among other things, the money and time to deal with stressful events. For example, the physical and psychological responses you experience if your car breaks down tend to be more negative if you are broke and pressed for time than if you have the money for repairs and the freedom to take a day off from work.

Effective coping methods can also reduce the impact of stressors (Cote & Pepler, 2002). Most of these methods can be classified as either problem-focused or emotion-focused. *Problem-focused* coping methods involve efforts to change or eliminate a source of stress, whereas *emotion-focused* techniques attempt to control the negative emotional consequences of stressors (Folkman et al., 1986). Many people use both kinds of coping. For example, you might deal with the problem of noise from a nearby factory by forming a community action group to push for tougher noise-reduction laws and at the same time

TABLE 12.3 WAYS OF COPING**TRY THIS**

Coping is defined as cognitive and behavioral efforts to manage specific demands that people perceive as taxing their resources (Folkman et al., 1986). This table illustrates two major approaches to coping measured by Folkman and Lazarus's (1988) Ways of Coping Questionnaire: problem-focused and emotion-focused. Ask yourself which approach you usually take when faced with stressors. Now rank the coping skills under each major approach in terms of how often you tend to use each. Do you rely on just one or two? Or do you adjust your coping strategies to fit different kinds of stressors?

Coping Skills	Example
Problem-focused coping	
Confronting	"I stood my ground and fought for what I wanted."
Seeking social support	"I talked to someone to find out more about the situation."
Planful problem solving	"I made a plan of action and I followed it."
Emotion-focused coping	
Self-controlling	"I tried to keep my feelings to myself."
Distancing	"I didn't let it get to me; I tried not to think about it too much."
Positive reappraisal	"I changed my mind about myself."
Accepting responsibility	"I realized I brought the problem on myself."
Escape/avoidance (wishful thinking)	"I wished that the situation would go away or somehow be over with."

Source: Adapted from Folkman et al. (1986).

calm your anger when noise occurs by mentally focusing on the group's efforts to improve the situation (Folkman & Moskowitz, 2000; Hatfield et al., 2002). Susan Folkman and Richard Lazarus (1988) devised a widely used questionnaire to assess the specific ways in which people cope with stressors; Table 12.3 shows some examples from their questionnaire.

Particularly when a stressor is difficult to control, it is sometimes helpful to fully express and think about the emotions you are experiencing in relation to the stressful event (Niederhoffer & Pennebaker, 2002; Stanton & Low, 2012). In one program designed to promote this kind of emotional expression, also known as *emotional disclosure*, people spend thirty to sixty minutes a day for several days writing or talking about their thoughts and feelings about past or present stressors. Laboratory studies have shown this emotional coping strategy to significantly reduce psychological and physical stress responses (Petrie et al., 2004; Willmott et al., 2011). Its benefits have been observed outside the laboratory, too. People recovering from their first heart attack who were asked to write about their emotions were less likely to have future heart symptoms or hospitalizations than those who had not been assigned to this emotional coping strategy task (Willmott et al., 2011). Even wound healing appears to go faster in people who have been asked to write about their emotional reactions to their health problems (Koschwanez et al., 2013). Some individuals who use humor to help them cope also show better adjustment and milder physiological reactivity to stressful events (Martin, 2001; Moran, 2002).

You've Got a Friend

Even when social support cannot eliminate stressors, it can help people, such as these cancer survivors, feel less anxious, more optimistic, more capable of control, and more willing to try new ways of dealing with stressors (Trunzo & Pinto, 2003). Those who provide support may feel better, too (Brown et al., 2003).

Dimitrios Kambouris/Getty Images for Avon/Getty Images Entertainment/Getty Images



Social Support

Has a good friend comforted or reassured you during troubled times? If so, you have experienced the value of *social support* in easing the impact of stressful events. Social support consists of emotional, tangible, or informational resources provided by other people. These people might help eliminate a stressor (by, say, fixing your car), suggest how to deal with the stressor (by recommending a good mechanic), or reduce a stressor's impact by providing companionship and reassurance (Sarason, Sarason, & Gurung, 1997). The people you can depend on for support make up your network of **social support** (Burleson, Albrecht, & Sarason, 1994).

The stress-reducing effects of social support have been documented in people dealing with a wide range of stressors, including cancer, stroke, military combat, loss of loved ones, natural disasters, arthritis, AIDS, and even ethnic discrimination (e.g., Antoni & Lutgendorf, 2007; Penner, Dovidio, & Albrecht, 2001; Smyth et al., 2014; Weihs, Enright, & Simmens, 2008). Social support can have health benefits, too. For example, students who get emotional support from friends show better immune system functioning than those with less-adequate social support (Cohen & Herbert, 1996). This may be why people with strong social support are less vulnerable to colds and flu during exams and other periods of high academic stress (Pressman et al., 2005; Taylor, Dickerson, & Klein, 2002). Having strong social support is also associated with faster recovery from surgery or illness, possibly because helpful friends and family members encourage patients to follow medical advice (Brummett et al., 2005; Taylor, 2002). Even people with cancer do better if they have strong social support (Hughes et al., 2014; Yoo et al., 2014). People in stronger social networks—especially those filled with happy people—tend to be happier than those in weaker networks and may even enjoy better mental functioning in old age (Fowler & Christakis, 2008; Gleibs et al., 2011). According to some researchers, having inadequate social support can be as dangerous as smoking, obesity, or lack of exercise in that it nearly doubles a person's risk of dying from disease, suicide, or other causes (Kiecolt-Glaser & Newton, 2001; Rutledge et al., 2004).

Exactly how social support brings about its positive effects is not entirely clear. We do know that people who receive more social support in response to stressors display patterns of brain activation that differ from those with less support (Eisenberger et al., 2013). These data suggest support-related differences in the mental processing of stressors, but what might those differences be? James Pennebaker (1995, 2000) has suggested that social support may help prevent illness by providing the person under stress with an opportunity to express pent-up thoughts and emotions. Pennebaker and other researchers suggest that keeping important things to yourself is itself a stressor (e.g., Dalgleish, Hauer, & Kuyken, 2008; Srivastava et al., 2009). In a laboratory experiment, for example, participants

social support The friends and social contacts on whom one can depend for help and support.

who were asked to deceive an experimenter showed elevated physiological arousal (Pennebaker & Chew, 1985). Further, if the spouses of people who die as the result of an accident or suicide do not or cannot confide their feelings to others, they're especially likely to develop physical illness during the year following the death (Pennebaker & O'Heeron, 1984). Disclosing (even anonymously) the stresses and traumas one has experienced is associated with enhanced immune functioning, reduced physical symptoms, and decreased use of health services (e.g., Campbell & Pennebaker, 2003; Epstein, Sloan, & Marx, 2005; Pachankis & Goldfried, 2010). This may explain why support groups for a wide range of problems such as bereavement, overeating, and alcohol and drug abuse tend to promote participants' physical health (Taylor et al., 2002).

Research in this area is made more challenging by the fact that the relationship between social support and the impact of stressors is not a simple one. For one thing, the quality of social support can influence the ability to cope with stress, but the reverse may also be true: your ability to cope may determine the quality of the social support you receive (McLeod, Kessler, & Landis, 1992). People who complain endlessly about stressors but never do anything about them may discourage social support, whereas those with an optimistic, action-oriented approach may attract support.

Second, *social support* refers not only to your relationships with others but also to the recognition that others care and will help (Demaray & Malecki, 2002). Some relationships in a seemingly strong social network can be stormy, fragile, or shallow, resulting in interpersonal conflicts that can have an adverse effect on health (Ben-Ari & Gil, 2002; Malarkey et al., 1994).

Third, the quality of social support can alter its effectiveness. For example, children coping with the 2011 Japan tsunami showed more-severe stress effects if their parents suddenly became more protective, less willing to give them independence, and more often emphasized life's dangers (Cobham & McDermott, 2014). The quality of social support can have longer-term effects, too. In one study, people who viewed their marriages as supportive and positive were less likely than other married people to have developed harmful plaque in their coronary arteries (Uchino, Smith, & Berg, 2014).

Evidently, both in the short term and in the long term, having the right kind of social support appears to be what matters. In fact, having too much support or the wrong kind of support can be as bad as not having enough (Reynolds & Perrin, 2004). Dangerous behaviors such as smoking or overeating, for example, can be harder to give up if one's social support consists largely or entirely of smokers or overeaters (Christakis & Fowler, 2007). People whose friends and family overprotect them from stressors may have fewer opportunities to learn effective coping strategies. They may also lose confidence in the strategies they have and thus put less energy into their coping efforts. If the efforts of people in a social support network become annoying, disruptive, or interfering, they can actually increase stress and intensify psychological and physical problems (Gleason et al., 2008; Newsom et al., 2008). It has even been suggested that among people under intense stress, the benefits of having a large social support network may be offset by the dangers of catching a cold or the flu from people in that network (Hamrick, Cohen, & Rodriguez, 2002).

Finally, the value of social support may depend on the kind of stressor being encountered. So although having a friend nearby might reduce the impact of some stressors, it might amplify the impact of others. In one study, participants who were about to make a speech experienced the task as more threatening—and showed stronger physical and psychological stress responses—when a friend was with them than when they were waiting alone (Stoney & Finney, 2000).

Stress, Personality, and Gender

The impact of stress on health appears to depend not only on how people think about particular stressors but also to some extent on how they think about and react to the world in general. For instance, stress-related health problems tend to be especially common among

people whose “disease-prone” personalities lead them to (1) try to ignore stressors when possible; (2) perceive stressors as long-term, catastrophic threats that they brought on themselves; and (3) be pessimistic about their ability to overcome stressors (e.g., Penninx et al., 2001; Roy et al., 2010; Suinn, 2001).

Other cognitive styles, such as those characteristic of “disease-resistant” personalities, help insulate people from the ill effects of stress. These people tend to think of stressors as temporary challenges to be overcome, not catastrophic threats. And they don’t constantly blame themselves for causing these stressors. One particularly important component of the “disease-resistant” personality seems to be *dispositional optimism*, the belief or expectation that things will work out positively (Folkman & Moskowitz, 2000; Pressman & Cohen, 2005; Rosenkranz et al., 2003; Taylor, Kemeny et al., 2000). Optimistic people tend to live longer (Giltay et al., 2004, 2006) and to have more resistance than pessimists to colds and other infectious diseases (e.g., Boyce & Wood, 2011; Pressman & Cohen, 2005; Segerstrom & Sephton, 2010), which helps explain why optimistic students experience fewer physical symptoms at the end of the academic term (e.g., Ebert, Tucker, & Roth, 2002).

Optimistic older adults show different activation patterns in certain brain regions when shown distressing images, suggesting that optimism may affect activity of brain systems involved in regulating negative emotions (Bangen et al., 2013). Optimistic coronary bypass surgery patients tend to heal faster and stay healthier than pessimists (Scheier et al., 1989, 1999), perceive their quality of life following coronary surgery to be higher (Fitzgerald et al., 1993), and respond better to treatments for post-operative depression (Tindle et al., 2012) than do patients with less optimistic outlooks. And among HIV-positive men, dispositional optimism has been associated with lower psychological distress, fewer worries, and lower perceived risk of acquiring full-blown AIDS (Johnson & Endler, 2002). These effects appear in part due to optimists’ tendency to use challenge-oriented, problem-focused coping strategies that attack stressors directly, in contrast to pessimists’ tendency to use emotion-focused coping strategies, such as denial and avoidance (Brenes et al., 2002; Moskowitz et al., 2009). They also tend to be happier than pessimists, a tendency associated not only with less intense and less dangerous physiological responses to stressors but also with greater success in life (e.g., Lyubomirsky, King, & Diener, 2005).

Indeed, like optimism, happiness and other positive emotions and traits, such as hope, resilience, conscientiousness, and curiosity, have been associated with better health and longer life (Challen, Machin, & Gillham, 2014; Cohen et al., 2003a; Friedman et al., 2014; Ong et al., 2006; Xu & Roberts, 2010). For example, a long-term study of Catholic nuns found that those who wrote with the most positive emotional style when they were young lived longer than those whose writing contained less positive emotions (Danner, Snowden, & Friesen, 2001). Studies like these represent a new line of research in health psychology that focuses on investigating and promoting the positive emotions, behaviors, and cognitive styles associated with better health (Kashdan & Rottenberg, 2010; Seligman, Steen, et al., 2005).

Gender may also play a role in responses to stressors (Tomova et al., 2014). In a review of 200 studies of stress responses and coping methods, Shelley Taylor and her colleagues found that males under stress tended to get angry, avoid stressors, or both, whereas females were more likely to help others and to make use of social support (Taylor, Klein et al., 2000; Taylor et al., 2002). Further, in the face of equally intense stressors, men’s physical responses tend to be more intense than women’s (Stoney & Matthews, 1988). This is not true in every case, of course (Smith et al., 2008), but why should gender differences show up at all? Though the learning of the gender roles that we discuss in the human development chapter surely plays a part (Eagly & Wood, 1999), Taylor proposes that women’s “tend and befriend” style differs from the “fight-flight” pattern often seen in men partly because of gender differences in how hormones combine under stress. Consider, for example, oxytocin (pronounced “ox-see-TOH-sin”), a hormone released in both sexes in response to stressors, including social stressors. Taylor suggests that oxytocin interacts differently with male and female sex hormones: in men, it amplifies physical

responses to stress, but it reduces those responses in women (Light et al., 2005). This gender difference could lead to the more intense emotional and behavioral stress responses typical of men, and it might be partly responsible for men's greater vulnerability to heart disease and other stress-related illnesses (Kajantie & Phillips, 2006). If that is the case, gender differences in stress responses may help explain why women in industrialized societies live an average of five to ten years longer than men (Hoyert, Kung, & Smith, 2005; Kajantie, 2008). The role of gender-related hormones in responding to stress is supported by the fact that there are few (if any) gender differences in children's responses to stress. Those differences begin to appear only around adolescence, when sex hormone differences become pronounced (Allen & Matthews, 1997).

FOCUS ON RESEARCH METHODS

PERSONALITY AND HEALTH

The way people think and act in the face of stressors, the ease with which they attract social support, and their tendency to be optimists or pessimists are but a few aspects of *personality*.

What was the researchers' question?

Are there other personality characteristics that protect or threaten people's health? This was the question asked by Howard Friedman and his associates (Friedman, 2000; Friedman et al., 1995a, 1995b). In particular, they tried to identify aspects of personality that increase the likelihood that people will die prematurely from heart disease, high blood pressure, or other chronic diseases.

LINKAGES Are childhood traits related to how long we live? (a link to Personality)

How did the researchers answer the question?

Friedman suspected that an answer might lie in the results of the Terman Life Cycle Study of Intelligence. As described in the chapter on thought and language, the study was originally designed to measure the long-term development of 1,528 gifted California children (856 boys and 672 girls) who were nicknamed the "Termites," after Louis Terman, the research team leader (Terman & Oden, 1947).

Starting in 1921, and every five to ten years thereafter, the team gathered information about the Termites' personality traits, social relationships, stressors, health habits, and many other variables. The data were collected through questionnaires and interviews with the Termites themselves as well as with their teachers, parents, and other family members. By the early 1990s, about half of the Termites had died. It was then that Friedman realized that the Terman Life Cycle Study could shed light on the relationship between personality and health, because the personality traits identified in the Termites could be related to how long they lived. So he examined the Termites' death certificates, noting the dates and causes of death, and then looked for associations between their personalities and the length of their lives.

What did the researchers find?

Friedman and his colleagues found that one of the most important predictors of long life was a dimension of personality known as *conscientiousness*, or social dependability (described in the personality chapter). Termites who in childhood had been seen as truthful, prudent, reliable, hard working, and humble tended to live longer than those whose parents and teachers had identified them as impulsive and lacking in self-control.

Friedman also examined the Terman Life Cycle Study for what it suggested about the relationship between health and social support. In particular, he compared Termites whose parents had divorced or who had been in unstable marriages themselves with those who grew up in stable homes and who had stable marriages. He discovered that people who had experienced parental divorce during childhood or who themselves had unstable marriages died an average of four years earlier than those whose close social relationships had been less stressful.

(continued)

What do the results mean?

Did these differences in personality traits and social support actually cause some Termites to live longer than others? Friedman's research is based mainly on correlational analyses, so it was difficult for the investigators to draw conclusions about what caused the relationships they observed. Still, Friedman and his colleagues searched the Terman data for clues to mechanisms through which personality and other factors might have exerted a causal influence on how long the Termites lived (Peterson et al., 1998). For example, they evaluated the hypothesis that conscientious, dependable Termites who lived socially stable lives might have followed healthier lifestyles than those who were more impulsive and socially stressed. They found that people in the latter group did, in fact, tend to eat less healthy diets and were more likely to smoke, drink to excess, or use drugs. But health behaviors alone did not fully account for their shorter average life spans. Another possible explanation is that conscientiousness and stability in social relationships reflect a general attitude of caution that goes beyond eating right and avoiding substance abuse. Friedman found some support for this idea in the Terman data. Termites who were impulsive or low on conscientiousness were somewhat more likely to die from accidents or violence than those who were less impulsive.

What do we still need to know?

The Terman Life Cycle Study does not provide final answers about the relationship between personality and health. However, it has generated some important clues and a number of intriguing hypotheses to be evaluated in research with more representative samples of participants. Some of that research has already taken place and tends to confirm Friedman's findings about conscientiousness (e.g., Hampson et al., 2006; Kern & Friedman, 2008; Roberts et al., 2009). Further, Friedman's decision to reanalyze a set of data on psychosocial development as a way of exploring issues in health care psychology stands as a fine example of how a creative researcher can pursue answers to complex questions that are difficult or impossible to study via controlled experiments.

Our discussion of personality and other factors that can alter the impact of stressors should make it obvious that what is stressful for a given individual is not determined fully and simply by predispositions, coping styles, or situations (see "In Review: Stress Responses and Stress Mediators"). Even more important are interactions between the person and the situation, the mixture of each individual's coping resources with the specific characteristics of the situations encountered.

IN REVIEW

STRESS RESPONSES AND STRESS MEDIATORS

Category	Examples
Responses	
Physical	The fight-flight reaction involves increased heart rate, respiration, and muscle tension as well as sweating and dilated pupils. Activation of SAM and HPA systems releases catecholamines and corticosteroids. Organ systems involved in prolonged resistance to stressors eventually break down.
Psychological	<i>Emotional</i> examples include anger, anxiety, depression, and other emotional states. <i>Cognitive</i> examples include inability to concentrate or think logically, ruminative thinking, and catastrophizing. <i>Behavioral</i> examples include aggression and escape/avoidance tactics (including suicide attempts) and health-risk behaviors.
Mediators	
Appraisal	Thinking of a difficult new job as a challenge will create less discomfort than focusing on the threat of failure.

(continued)

IN REVIEW

STRESS RESPONSES AND STRESS MEDIATORS (CONT.)

Category	Examples
Predictability	A tornado that strikes without warning may have a more devastating emotional impact than a long-predicted hurricane.
Control	Repairing a disabled spacecraft may be less stressful for the astronauts doing the work than for their loved ones on earth, who can do nothing to help.
Coping resources and methods	Having no effective way to relax after a hard day may prolong tension and other stress responses.
Social support	Having no one to talk to about a rape or other trauma may amplify the negative impact of the experience.

In Review Questions

1. The friends and family we can depend on to help us deal with stressors are called our _____ network.
2. Fantasizing about winning money is a(n) _____ focused way of coping with financial stress.
3. Sudden, extreme stressors may cause psychological and behavioral problems known as _____.

THE PHYSIOLOGY AND PSYCHOLOGY OF HEALTH AND ILLNESS

How does stress affect your immune system?

Several studies mentioned so far show that people under stress are more likely than less-stressed people to develop infections. Other research shows that they are also more likely to experience flare-ups of the latent viruses responsible for oral herpes (cold sores) or genital herpes (Cohen & Herbert, 1996). In the following sections we focus on some of the ways that these and other illnesses are related to the impact of stress on the immune system and other body systems.

LINKAGES Can stress give you the flu? (a link to Biological Aspects of Psychology)

Stress, Illness, and the Immune System

On March 19, 1878, at a seminar at the Académie de Médecine in Paris, Louis Pasteur showed his distinguished audience three chickens. One bird had been raised normally and was healthy. A second bird had been intentionally infected with bacteria but given no other treatment; it was also healthy. The third chicken that Pasteur presented was dead. It had been infected with the same bacteria as the second bird, but it had also been physically stressed by being exposed to cold temperatures; as a result, the bacteria had killed it (Kelley, 1985).

Research conducted since Pasteur's time has greatly expanded our knowledge about how stressors affect the body's reaction to disease and has expanded our notions of stress to include not only environmental factors but also psychological and social ones. **Psychoneuroimmunology** is the field that examines the interaction of psychological and physiological processes that strengthen or weaken the body's ability to defend itself against disease (Ader, 2001).

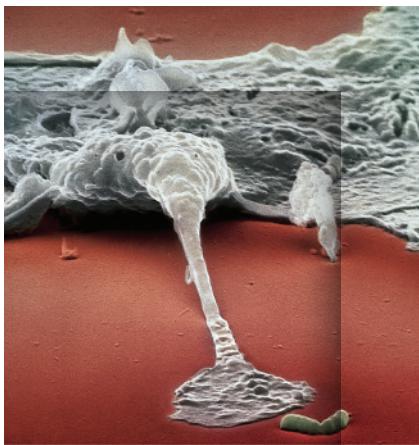
The Immune System and Illness

The body's first line of biological defense against invading substances and microorganisms is the **immune system**. The immune system is perhaps as complex as the nervous system, and it contains as many cells as the brain (Guyton, 1991). Some of these cells are in organs such as the thymus and spleen and lymph nodes, whereas others circulate in the bloodstream, entering tissues throughout the body. Components of the immune system kill or inactivate foreign or harmful substances in the body, such as viruses and bacteria (Simpson, Hurtley, & Marx, 2000). **Inflammation** (seen externally as swelling and redness

psychoneuroimmunology The field that examines the interaction of psychological and physiological processes affecting the body's ability to defend itself against disease.

immune system The body's first line of biological defense against invading substances and microorganisms.

inflammation An immune system response that combats infectious agents and helps to heal injuries.



The Body's Internal Defense System

A patrolling immune system cell sends out an extension known as a *pseudopod* to engulf and destroy a bacterial cell before alerting more defenders. These immune cells are able to squeeze out of the bloodstream and enter organs, where they destroy foreign cells.

Boehringer Ingelheim International GmbH/photo Lennart Nilsson, *The Incredible Machine*, National Geographic Society/Scanpix

around a wound) is an immune system response that helps to fight infectious agents and promote the healing of injuries. However, if this inflammatory response is prolonged or excessive it can promote or worsen asthma, coronary artery disease, diabetes, some cancers, and other chronic conditions (Chiang et al., 2012; Cohen et al., 2012).

If our immune systems are impaired, we are left more vulnerable to colds, mononucleosis, and many other infectious diseases (Potter & Zautra, 1997). Even the healing of wounds is slower when we experience psychological stress (Broadbent & Koschwanez, 2012). The human immunodeficiency virus (HIV) disables the immune system, leading to AIDS and leaving the HIV-infected person defenseless against other infections or cancers. The immune system can also become overactive, with devastating results. Many chronic, progressive diseases—including arthritis, diabetes, and lupus erythematosus—are now recognized as *autoimmune disorders*. In these cases, cells of the immune system begin to attack and destroy normal body cells (Oldenberg et al., 2000; Wang & Zheng, 2013).

An important aspect of the human immune system is the action of the white blood cells, called *leukocytes* (pronounced “LU-koh-sites”). These cells are formed in the bone marrow and serve as the body’s mobile defense units. Leukocytes are called to action when foreign substances are detected. Among the varied types of leukocytes are *B-cells*, which produce *antibodies* to fight foreign toxins; *T-cells*, which kill other cells; and *natural killer cells*, which destroy a variety of foreign organisms and are particularly important in fighting viruses and tumors. The brain can influence the immune system indirectly by altering the secretion of adrenal hormones, such as cortisol, that modify the circulation of T-cells and B-cells. The brain can also influence the immune system directly by connecting with the immune organs, such as the thymus, where T-cells and B-cells are stored (Felten et al., 1991; Maier & Watkins, 2000).

The Immune System and Stress

A wide variety of stressors can lead to suppression of the immune system (Vitlic, Lord, & Phillips, 2014). The effects are especially strong in the elderly (Penedo & Dahn, 2004), but they occur in everyone (Kiecolt-Glaser & Glaser, 2001; Kiecolt-Glaser et al., 2002). One study showed that as first-year law students participated in class, took exams, and experienced other stressful aspects of law school, they showed a decline in several measures of immune functioning (Segerstrom et al., 1998). Similarly, decreases in natural killer cell activity have been observed in both men and women following the deaths of their spouses (Irwin et al., 1987), and a variety of immune system impairments have been found in people suffering the effects of prolonged marital conflict, divorce, unemployment, lack of social support, loneliness, or extended periods of caring for elderly relatives (e.g., Cohen et al., 2007; Kiecolt-Glaser et al., 2003, 2005; Sbarra, Law, & Portley, 2011). The link between stress and the immune system may even cross generations. Animal studies show that when a pregnant mother experiences stress, her offspring show changes in their immune systems, suggesting that prenatal stress exposure can play a role in immune-related disorders such as allergies (Veru et al., 2014).

The relationship between stress and the immune system can be critical to people who are HIV positive but do not have AIDS. Because their immune systems are already vulnerable, further stress-related impairments might be life threatening. Research indicates that psychological stressors are associated with the progression of HIV-related illnesses (e.g., Antoni et al., 2000; Gore-Felton & Koopman, 2008). Unfortunately, people with HIV (and AIDS) face a particularly heavy load of immune-suppressing psychological stressors, including uncertainty about the future. A lack of perceived control and resulting depression and anxiety can further magnify their stress responses (e.g., Sewell et al., 2000).

Stress, Illness, and the Cardiovascular System

Earlier we mentioned the role of the sympatho-adreno-medullary (SAM) system in mobilizing the body’s defenses during times of threat. Because the SAM system is linked to the cardiovascular system, its repeated activation in response to stressors has been linked to the development of coronary heart disease (CHD), high blood pressure (hypertension), and stroke. For example, adults in a nationwide sample who reported the strongest

and longest-lasting worry about terrorism after the 9/11 attacks on New York City and Washington, D.C., were three times more likely than less worried people to develop heart problems over the next three years. Even those who reported the most intense temporary distress right after 9/11 were at elevated risk of developing heart problems over those same three years (Holman et al., 2008). Less severe stressors—such as long-term exposure to airport noise—can also increase the risk of heart disease (Correia et al., 2013).

Some cardiac problems occur sooner after stress exposure, especially if the stressor is severe, which may explain why heart attacks are more common in the weeks immediately following the death of a spouse (Carey et al., 2014). The link between CHD and physical stress responses appears especially close in people whose stress responses are especially strong. For example, among healthy young adult research participants, those whose blood pressure rose most dramatically in response to a mild stressor or a series of stressors were the ones most likely to develop hypertension later in life (Light et al., 1999; Matthews et al., 2004).

THINKING CRITICALLY

DOES HOSTILITY INCREASE THE RISK OF HEART DISEASE?

Health care psychologists see hostility as characterized by suspiciousness, resentment, frequent anger, antagonism, and distrust of others (Krantz & McCeney, 2002; Williams, 2001). The identification of hostility as a risk factor for coronary heart disease and heart attack may be an important breakthrough in understanding these illnesses, which remain among the chief causes of death in the United States and most other Western nations. But is hostility as dangerous as health care psychologists suspect?

What am I being asked to believe or accept?

Many researchers claim that individuals who display hostility—especially when it is accompanied by irritability and impatience—increase their risk for coronary heart disease and heart attack (e.g., Bunde & Suls, 2006; Compare et al., 2014; Krantz & McCeney, 2002; Smith et al., 2007). This risk, they say, is independent of other risk factors such as heredity, diet, smoking, and drinking alcohol.

What evidence is available to support the assertion?

There is evidence that hostility and heart disease are related, but scientists are still not sure about what causes the relationship. In one study, over 1000 people with known heart disease answered questions about how much hostility they experience in their attitudes and behavior. Those who reported more hostility at the start of the study later had more heart attacks, strokes, or deaths as compared to those who had reported less hostility (Wong et al., 2013). Some suggest that the risk of coronary heart disease and heart attack is elevated in hostile people because these people tend to be unusually reactive to stressors, especially when challenged. During interpersonal conflicts, for example, people predisposed to hostile behavior display not only overt hostility but also unusually large increases in blood pressure, heart rate, and other aspects of autonomic reactivity (Brondolo et al., 2003; Suls & Wan, 1993). In addition, it takes hostile individuals longer than normal to get back to their resting levels of autonomic functioning (Gerin et al., 2006). Like a driver who damages a car's engine by pressing the accelerator and applying the brakes at the same time, these "hot reactors" may create excessive wear and tear on the heart's arteries as their increased heart rate forces blood through tightened vessels (Johnston, Tuomisto, & Patching, 2008). Increased sympathetic nervous system activation not only puts stress on the coronary arteries but also leads to surges of stress-related hormones from the adrenal glands. High levels of these hormones are associated with increases in cholesterol and other fatty substances that are deposited in arteries and contribute to coronary heart disease (Bierhaus et al., 2003; Stoney & Hughes, 1999). Some studies show that cholesterol levels are elevated in the blood of hostile people (Sahebzamani et al., 2013).

Hostility may affect heart disease risk less directly as well, through its impact on social support. Some evidence suggests that hostile people get fewer benefits from social support (Lepore, 1995). Failing to use this support—and possibly offending potential supporters in the process—may intensify the impact of stressful events on hostile people. The result may be increased anger, antagonism, and, ultimately, additional stress on the cardiovascular system.

(continued)



You Can't Fire Me—I Quit!

For a time, researchers believed that anyone who displayed the pattern of aggressiveness, competitiveness, and nonstop work known as Type A behavior was at increased risk for heart disease (Friedman & Rosenman, 1974). More recent research, however, has led to the hypothesis that the danger lies not in these characteristics alone but in hostility, which is seen in some, but not all, Type A people.

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Are there alternative ways of interpreting the evidence?

Studies suggesting that hostility causes coronary heart disease are not true experiments. Researchers cannot manipulate the independent variable by creating hostility in randomly selected people in order to assess its effects on heart health. Accordingly, we have to consider other possible explanations of the observed relationship between hostility and heart disease.

For example, some researchers suggest that higher rates of heart problems among hostile people are not due entirely to the impact of hostility on blood pressure, heart rate, and hormone surges. Since a high-sugar diet contributes to heart disease (Yang et al., 2014) and may also be associated with negative attitudes (Möttus et al., 2013), perhaps dietary choices could be the link between poor heart health with hostile behavioral tendencies. It may also be that a genetically determined tendency toward autonomic reactivity increases the likelihood of both hostility and heart disease (Cacioppo et al., 1998; Krantz et al., 1988). If this is the case, then the fact that hostility and coronary heart disease often appear in the same people might reflect not just the effects of hostility but also a third factor—autonomic reactivity—that contributes to both of them.

It has also been suggested that hostility may be only one of many traits linked to heart disease. Depressiveness, hopelessness, pessimism, anger, and anxiety may be involved, too (e.g., Kubzansky, Davidson, & Rozanski, 2005; Nicholson, Fuhrer, & Marmot, 2005; Roy et al., 2010; Suls & Bunde, 2005).

What additional evidence would help evaluate the alternatives?

Research on the role these other traits may play in heart disease will be vital, and some of that work has already been done. One way to test whether hostile people's higher rates of heart disease are related specifically to their hostility or to a more general tendency toward intense physiological arousal is to examine how these individuals react to stress when they are not angry. Some researchers have done this by observing the physiological reactions of hostile people during the stress of surgery. One study found that even under general anesthesia, such people show unusually strong autonomic reactivity (Krantz & Durel, 1983). Because these patients were not conscious, it appears that oversensitivity to stressors, not hostile thinking, caused their exaggerated stress responses. This possibility is supported by research showing that individuals who have strong blood pressure responses to stressors also show different patterns of brain activity during stress than other people do (Gianaros et al., 2005).

What conclusions are most reasonable?

Most studies continue to find that among generally healthy people, those who are hostile—especially men—are at greater risk for heart disease and heart attacks than other people (Compare et al., 2014; Mathews, 2013; Wong et al., 2014). However, the picture is complex; it appears that many interacting factors affect the relationship between hostility and heart problems (Sloan et al., 2010).

A more elaborate psychobiological model may be required—one that takes into account that (1) some individuals may be biologically predisposed to react to stress with hostility and increased cardiovascular activity, each of which can contribute to heart disease; (2) hostile people help create and maintain stressors through aggressive thoughts and actions, which can provoke others to be aggressive; and (3) hostile people are more likely than others to smoke, drink alcohol to excess, overeat, fail to exercise, and engage in other heart-damaging behaviors (Kiecolt-Glaser, 2010).

We must also keep in mind that the relationship between heart problems and hostility may not be universal. Although this relationship appears to hold for women as well as men and for individuals in various ethnic groups (e.g., Nakano & Kitamura, 2001; Olson et al., 2005; Yoshimasu et al., 2002), final conclusions must await further research that examines the relationship between hostility and heart disease in other cultures (Finney, Stoney, & Engebretson, 2002).

PROMOTING HEALTHY BEHAVIOR

Who is most likely to adopt a healthy lifestyle?

Health care psychologists are deeply involved in the development of smoking cessation programs, in campaigns to discourage young people from taking up smoking, in anti-alcoholism efforts, in the prevention of skin cancer through sun safety education, in promoting regular exercise, in encouraging health care workers to wear protective masks and

**Doctor's Orders**

Despite physicians' instructions, many patients fail to take their blood pressure medication and continue to eat an unhealthy diet. Noncompliance with medical advice is especially common when cultural values and beliefs conflict with that advice. Aware of this problem, health care psychologists are developing culture-sensitive approaches to health promotion and disease prevention (Kazarian & Evans, 2001).

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follow other safety practices, and in the fight against the spread of HIV and AIDS (e.g., Albarracín et al., 2008; Grant & Hofmann, 2011; Lally et al., 2010; Lichtenstein, Zhu, & Tedeschi, 2010; Lombard et al., 2010; Tybur et al., 2011). They are also working to identify individuals who are at elevated risk for disease because of genetic predispositions or exposure to stressors early in life.

In addition, health care psychologists help promote early detection of disease. Encouraging women to perform breast self-examinations and men to do testicular self-examinations are just two examples of health care psychology programs that can save thousands of lives each year (Taylor, 2002). Health care psychologists have also explored the reasons why some people fail to follow public health recommendations or doctors' orders that are vital to the control of diabetes, heart disease, lung cancer, AIDS, high blood pressure, and various childhood diseases (Gardner et al., 2010; Griffin & Harris, 2011; Sieverding, Decker, & Zimmermann, 2010). Understanding these reasons and finding ways to encourage better adherence to medical advice could speed recovery, prevent unnecessary suffering, and save many lives (Howell & Shepperd, 2012; Rhodes, Warburton, & Bredin, 2009).

Efforts to reduce, eliminate, or prevent behaviors that pose health risks and to encourage healthy behaviors are called **health promotion** (Smith, Orleans, & Jenkins, 2004). For example, health care psychologists have developed programs that teach children as young as nine to engage in healthy behaviors and avoid health-risk behaviors. School systems now offer a variety of these programs, including those that give children and adolescents the skills necessary to turn down cigarettes, drugs, and unprotected sex (e.g., Layzer, Rosapep, & Barr, 2014). Methods to help young adults quit smoking appear on social media as well as in other venues (Ramo, Liu, & Prochaska, 2014). Health care psychologists have also brought healthy lifestyle campaigns into workplaces, and some are involved in creating video games designed to promote better health (Peng, 2009; Thompson et al., 2010). They teach stress-management techniques, too (Tuomilehto et al., 2001). These programs can create savings in future medical treatment costs (Blumenthal et al., 2002) and better health for those who participate (Orth-Gomér et al., 2009).

Even modest lifestyle changes can have profound effects. In one long-term study, adults who engaged in mild exercise for fifteen minutes a day had an average life expectancy that was three years longer than those who weren't physically active; every additional fifteen minutes of daily physical activity was associated with a further 4 percent reduction in mortality (Wen et al., 2011). Increased exercise is also associated with reduced health risks among children and adolescents (Ekelund et al., 2012).

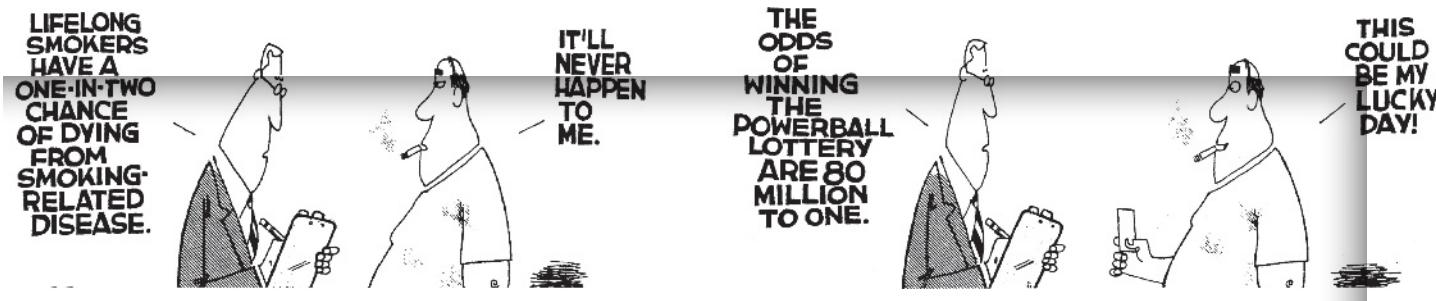
Health Beliefs and Health Behaviors

Health care psychologists also try to understand the social, educational, and cognitive factors that lead people to engage in health-endangering behaviors and that can interfere with efforts to adopt healthier lifestyles (e.g., Berkman, Falk, & Lieberman, 2011; Chiou, Yang, & Wan, 2011; Fitzsimons & Finkel, 2011; Moffitt et al., 2011; Peters et al., 2010). Their research has led to intervention programs that seek to change these patterns of thinking or at least take them into account (e.g., Freimuth & Hovick, 2012; Knauper et al., 2011; Kwan et al., 2012; Petrie & Weinman, 2012). In one study, for example, women who avoid thinking about the risks of breast cancer were more likely to get a mammogram screening after receiving health information that was tailored to their cognitive styles (Williams-Piehota et al., 2005).

This cognitive approach to health care psychology can be seen in various *health-belief models*. Irwin Rosenstock (1974) developed one of the most influential and extensively tested of these models (e.g., Aspinwall & Duran, 1999). He based his model on the assumption that people's decisions about health-related behaviors (such as smoking) are guided by four main factors:

1. Perceiving a *personal threat* of risk for getting a specific illness. (Do you believe that *you* will get lung cancer from smoking?)
2. Perceiving the seriousness of the illness and the consequences of having it. (How serious do you think lung cancer is? What will happen to you if you get it?)

health promotion The process of altering or eliminating behaviors that pose risks to health and, at the same time, fostering healthier behavior patterns.



As described in the chapter on thought and language, humans tend to underestimate the likelihood of common outcomes and overestimate the likelihood of rare events. When this tendency causes people to ignore the dangers of smoking and other health-risk behaviors, the results can be disastrous.

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3. Believing that changing a particular behavior will reduce the threat. (Will stopping smoking prevent *you* from getting lung cancer?)
4. Comparing the *perceived costs* of changing a health-risk behavior and the *benefits expected* from making that change. (Will the reduced risk of getting cancer in the future be worth the discomfort and loss of pleasure from not smoking?)

According to this health-belief model, people most likely to quit smoking would be those who believe that they are at risk for getting cancer from smoking, that cancer is serious and life threatening, and that the benefits of reducing cancer risks are greater than the costs of quitting (McCauley et al., 2006).

Other cognitive factors are the focus of other health-belief models (Ng et al., 2012). For example, people generally do not try to quit smoking unless they believe they can succeed. So *self-efficacy*, the belief that you are able to perform some behavior, is an additional consideration in making decisions about health behaviors (Armitage, 2005; Bandura, 1992). A related factor is the *intention* to engage in a healthy behavior (Albarracín et al., 2001; Webb & Sheeran, 2006).

Health-belief models have been useful in predicting a variety of health behaviors, including exercise (McAuley, 1992), safe-sex practices (Fisher, Fisher, & Rye, 1995), adherence to doctors' orders (Bavat et al., 2013), and having routine vaccinations and mammograms (Brewer et al., 2007).

Changing Health Behaviors: Stages of Readiness

Changing health-related behaviors depends not only on a person's health beliefs but also on that person's readiness to change. According to one model, successful change occurs in five stages (Prochaska, DiClemente, & Norcross, 1992; Schumann et al., 2005):

1. **Precontemplation:** The person does not perceive a health-related problem and has no intention of changing anytime soon.
2. **Contemplation:** A problem behavior has been identified and the person is seriously thinking about changing it.
3. **Preparation:** The person has a strong intention to change and has made specific plans to do so.
4. **Action:** The person is engaging successfully in behavior change.
5. **Maintenance:** The healthy behavior has continued for at least six months and the person is using newly learned skills to prevent relapse, or "backsliding."

These stages may actually overlap somewhat; for example, some "precontemplators" might actually be starting to contemplate change (Herzog & Blagg, 2007). The road from precontemplation through maintenance can be a bumpy one (Prochaska, 1994). Usually, people relapse and go through the stages repeatedly until they finally achieve stability in the healthy behavior they desire (Polivy & Herman, 2002). Smokers, for example, typically require three to four cycles through the stages over several years before they finally reach the maintenance stage (Piasecki, 2006).

TABLE 12.4 STEPS FOR COPING WITH STRESS

Many successful programs for systematically coping with stress guide people through several steps and are aimed at removing stressors that can be changed and improving responses to stressors that cannot be changed (Taylor, 2002).

Step	Task
1. Assessment	Identify the sources and effects of stress.
2. Goal setting	List the stressors and stress responses to be addressed. Designate which stressors can and cannot be changed.
3. Planning	List the specific steps to be taken to cope with stress.
4. Action	Implement coping plans.
5. Evaluation	Determine the changes in stressors and stress responses that have occurred as a result of coping methods.
6. Adjustment	Alter coping methods to improve results if necessary.

Programs for Coping with Stress and Promoting Health

Improving people's stress-coping skills is an important part of health care psychologists' health promotion work (e.g., Keogh, Bond, & Flaxman, 2006; Sbarra, Smith, & Mehl, 2012). Let's consider a few specific procedures and programs associated with this effort.



Dealing with Chemotherapy

Progressive relaxation training (Jacobson, 1938) involves briefly tensing groups of muscles throughout the body, one at a time, then releasing the tension and focusing on the resulting feelings of relaxation. It can be used to ease a variety of health-related problems, including the anxiety, physiological arousal, and nausea associated with cancer chemotherapy (Bernstein, Borkovec, & Hazlette-Stevens, 2000).

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Planning to Cope

Just as people with extra money in the bank have a better chance of weathering a financial crisis, those with effective coping skills have a better chance of escaping some of the more harmful effects of intense stress. Like family money, the ability to handle stress appears to come naturally—perhaps even genetically—to some individuals (Caspi et al., 2010). We know from animal studies, for example, that one of the brain's neurotransmitters acts on the amygdala to decrease the anxiety associated with acute stress (Ciccoippo et al., 2014). Perhaps variations between people in the activity of this system may be reflected in individual differences in the ability to cope with stress. Effective coping strategies can be learned, too. Programs for teaching these strategies include several stages, which are summarized in Table 12.4.

Bear in mind, though, that no one coping method is right for everyone or every stressor. For example, denying the existence of an uncontrollable stressor may be fine in the short run but may lead to problems if no other coping method is used. Similarly, people who rely entirely on active, problem-focused coping might handle controllable stressors well but find themselves nearly helpless in the face of uncontrollable ones (Murray & Terry, 1999). The most successful stress managers may be those who can adjust their coping methods to the demands of changing situations, differing stressors, and cultural traditions (Chen, 2012; Chen & Miller, 2012; Sheppes et al., 2011; Taylor, 2002).

Developing Coping Strategies

Strategies for coping with stress can be cognitive, emotional, behavioral, or physical. *Cognitive coping strategies* involve changing the way we think. These changes include thinking more calmly, rationally, and constructively in the face of stressors and may lead to a more hopeful outlook. For example, students with heavy course loads may experience anxiety, confusion, discouragement, lack of motivation, and the desire to run away from it all. Frightening, catastrophizing thoughts (such as "What if I fail?") magnify these stress responses. Cognitive coping strategies replace catastrophic thinking with thoughts that cast stressors as challenges, not threats (Ellis & Bernard, 1985). This substitution process is called *cognitive restructuring* (Lazarus, 1971; Meichenbaum, 1977). It involves first identifying upsetting thoughts (such as "I'll never figure this out!") and then developing and practicing

LINKAGES How can people manage stress? (a link to Treatment of Psychological Disorders)

TRY THIS

more constructive thoughts to use when under stress (such as “All I can do is the best I can”). Cognitive coping doesn’t eliminate stressors, of course, but it can help us to perceive them as less threatening and therefore less disruptive (Antoni et al., 2000; Chesney et al., 2003).

Finding social support is an effective *emotional coping strategy*. As mentioned earlier, feeling that you are cared about and valued by others can be a buffer against the ill effects of stressors, which can lead to enhanced immune functioning (Kiecolt-Glaser & Newton, 2001) and quicker recovery from illness (Taylor, 2002).

Behavioral coping strategies involve changing behavior in order to minimize the negative impact of stressors. Time management is one example. If it seems that you are always pressed for time, try developing a time management plan. The first step is to use a calendar or day planner to record how you spend each hour of each day in a typical week. Next, analyze the information you have recorded. Locate when and how you might be wasting time and how you might use your time more efficiently. Then set out a schedule for the coming week and stick to it. Make adjustments in subsequent weeks as you learn more realistic ways to manage your time. Time management can’t create more time, but it can help control catastrophizing thoughts by providing reassurance that there is enough time for everything and a plan for handling all that you have to do.

Physical coping strategies can be used to alter the undesirable physical responses that occur before, during, or after the appearance of stressors. The most common physical coping strategy is some form of drug use. Prescription medications are sometimes an appropriate coping aid, especially when stressors are severe and acute, such as the sudden death of one’s child. However, people who rely on prescribed or nonprescription drugs, including alcohol, to help them face stressors may come to believe that their ability to cope is due to the drug, not to their own skill. This belief can make people more and more psychologically dependent on the drug. Further, the drug effects that blunt stress responses may also interfere with the ability to apply other coping strategies. The resulting loss of perceived control over stressors may make those stressors even more threatening and disruptive.

Nonchemical methods of reducing physical stress reactions and improving stress coping include progressive relaxation training (Bernstein, Borkovec, & Hazlette-Stevens, 2000), physical exercise (Houser et al., 2013), biofeedback (Wells et al., 2012), yoga (Köhn et al., 2013), meditation (Goyal et al., 2014), and tai chi (Davidson et al., 2003), among others (Taylor, 2002).

“In Review: Methods for Coping with Stress” summarizes our discussion of methods for coping with stress.

IN REVIEW

METHODS FOR COPING WITH STRESS

Type of Coping Method	Examples
Cognitive	Thinking of stressors as challenges rather than as threats; avoiding perfectionism
Emotional	Seeking social support; getting advice
Behavioral	Implementing a time-management plan; where possible, making life changes to eliminate stressors
Physical	Progressive relaxation training; exercise; meditation

In Review Questions

1. Catastrophizing thoughts are best overcome through _____ coping strategies.
2. The first step in coping with stress is to _____ the sources and effects of your stressors.
3. True or false: It is best to rely on only one good coping strategy. _____

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of how stressors can lead to the development of mental disorders illustrates just one way that the topic of this chapter—health, stress, and coping—is linked to the subfield of abnormal psychology, which is described in the chapter on psychological disorders. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 12 Health, Stress, and Coping



LINKAGES

Can stress give you the flu?



CHAPTER 3
Biological Aspects
of Psychology

When do stress responses become mental disorders?



CHAPTER 14
Psychological Disorders

How does stress affect group decision making?



CHAPTER 16
Social Psychology

SUMMARY

Health Psychology

What do health care psychologists do?

Recognition of the link between stress and illness and of the role of behaviors such as smoking in increasing the risk of illness prompted the development of **health care psychology** (or **health psychology**). Health care psychologists work to understand how psychological factors are related to physical disease and to help people behave in ways that prevent or minimize disease and promote health.

Understanding Stress and Stressors

How do psychological stressors affect physical health?

Stress is an ongoing, interactive process that takes place as people adjust to and cope with their environment. **Stressors** are physical or psychological events or situations to which people must adjust. Psychological stressors include catastrophic events, life changes and strains, chronic stressors, and daily hassles. Stressors can be measured by tests such as the Social Readjustment Rating Scale (SRRS) and the Life Experiences Survey (LES), but scores on such tests

provide only a partial picture of the stress in a person's life. **Stress reactions** are physical and psychological responses to stressors.

Stress Responses

How do people react to stressors?

Physical and psychological stress responses can occur alone or in combination, and the appearance of one can often stimulate others.

Physical stress responses include changes in heart rate, respiration, and many other processes that are part of a pattern known as the **general adaptation syndrome**, or **GAS**. The GAS has three stages: alarm (or **fight-flight reaction**), resistance, and exhaustion. The GAS helps people resist stress, but if activated for too long it can lead to impairment of immune system functions as well as to physical illnesses; Selye called such illnesses **diseases of adaptation**.

Psychological stress responses can be emotional, cognitive, or behavioral. Anxiety, anger, and depression are among the most common emotional stress reactions. Cognitive stress reactions include ruminative thinking, catastrophizing, and disruptions in the ability to think clearly, remember accurately, and solve problems efficiently.

Behavioral stress responses include irritability, aggression, absenteeism, engaging in health-damaging behaviors, and even suicide attempts. Severe or long-lasting stressors can lead to ***burnout*** or to psychological disorders such as ***posttraumatic stress disorder (PTSD)***.

Stress Mediators

Why doesn't everyone react to stressors in the same way?

The key to understanding stress appears to lie in observing how particular people interact with specific stressors. Stressors are likely to have greater impact if an individual perceives them as threats or if they are unpredictable, uncontrollable, or unmanageable. The people most likely to react strongly to a stressor are those whose coping resources, coping methods, and ***social support*** are inadequate or perceived as inadequate.

The Physiology and Psychology of Health and Illness

How does stress affect your immune system?

Psychoneuroimmunology is the field that examines the interaction of psychological and physiological processes that affect the body's ability to defend itself against disease. When a person is under stress, some of the hormones released from the adrenal glands, such as cortisol, reduce

the effectiveness of the cells of the ***immune system*** (T-cells, B-cells, and natural killer cells), which use ***inflammation*** and other responses in combating foreign invaders, such as viruses and cancer cells.

People who are hostile appear to be at greater risk for heart disease than other people. The heightened reactivity to stressors that these people experience may damage their cardiovascular systems.

Promoting Healthy Behavior

Who is most likely to adopt a healthy lifestyle?

The process of altering or eliminating health-risk behaviors and encouraging healthy behaviors is called ***health promotion***. People's health-related behaviors are partly guided by their beliefs about health risks and what they can do about them.

The process of changing health-related behaviors appears to involve several stages, including precontemplation, contemplation, preparation, action, and maintenance. Understanding which stage people are in and helping them move through these stages is an important task in health care psychology.

To cope with stress, people must identify the stressors affecting them and develop a plan for coping with these stressors. Important coping skills include cognitive restructuring, acting to minimize the number or intensity of stressors, and using progressive relaxation training and other techniques for reducing physical stress reactions.

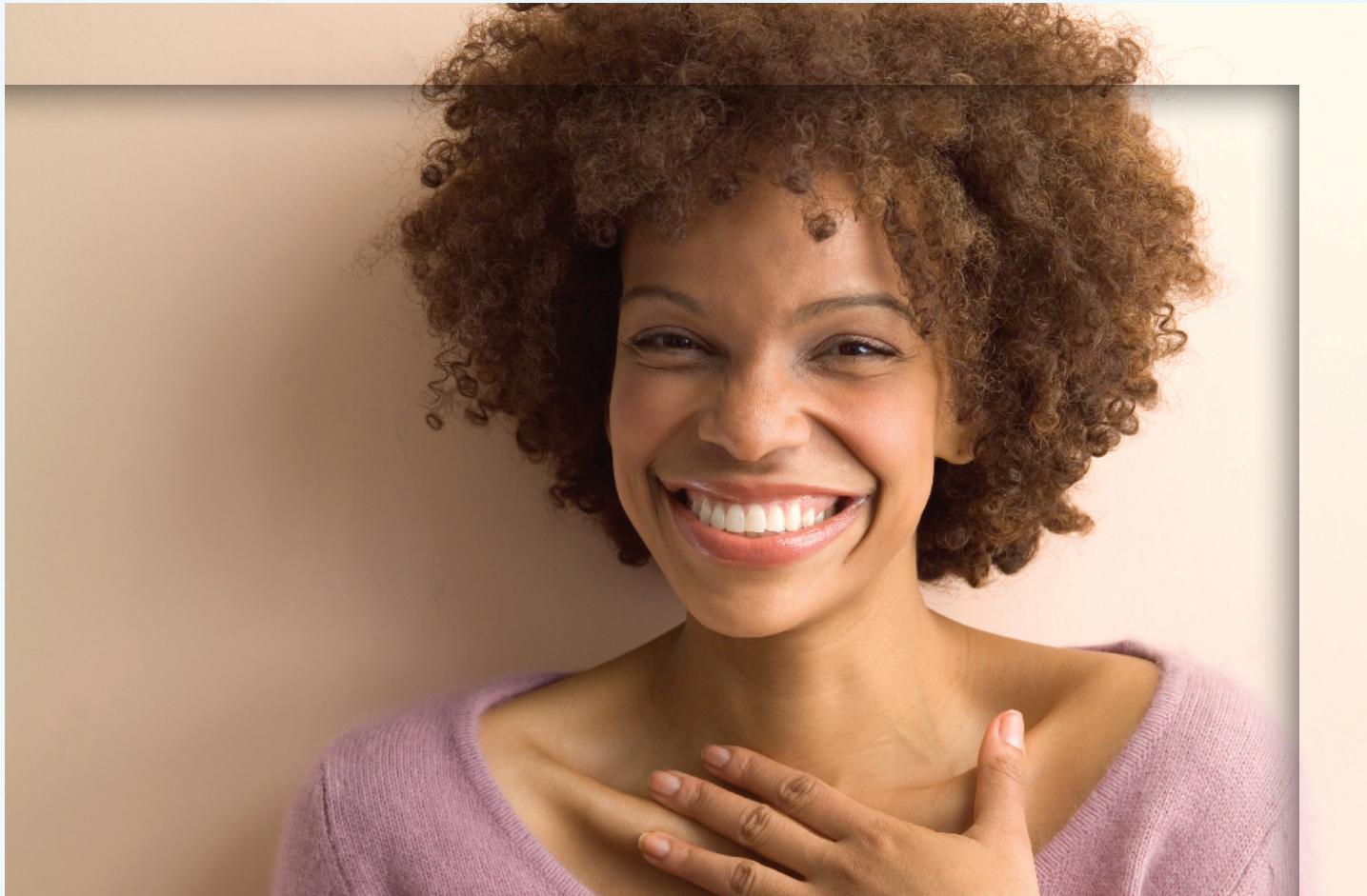
TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your response against the Answer Key at the end of the book.

1. Health research statistics show that your great-grandparents' generation was most likely to die from _____ diseases, whereas your own generation is most likely to die from _____ diseases.
 - a. infectious; infectious
 - b. chronic; chronic
 - c. infectious; chronic
 - d. chronic; infectious
 2. Stephanie married a wonderful guy, moved to a new city, and took a great new job, all in the same month. We would expect her to _____.
 - a. display physical and/or psychological stress responses
 - b. experience little stress, because these are all desirable changes
 - c. experience little stress, because these are not chronic stressors
 - d. experience physical stress responses only
 3. Doug lives next to a family that includes several teenagers. He is forever reminding them not to run across his front lawn. Their loud music often keeps him awake at night, and their cars are parked so that it is hard for him to back out of his driveway. These stressors can best be classified as _____.
 - a. life changes and strains
 - b. traumatic
 - c. catastrophic
 - d. daily hassles
4. Aaron's sympathetic nervous system is engaged in the fight-flight reaction. Which stage of the general adaptation syndrome (GAS) is he experiencing?
 - a. Alarm
 - b. Resistance
 - c. Exhaustion
 - d. Precontemplative
5. Bill and Ellen's car breaks down and it takes two hours for help to arrive. According to Shelley Taylor's research on stress and gender, Bill is likely to _____, and Ellen is likely to _____.
 - a. get angry; get angry, too
 - b. be supportive of Ellen; be supportive of Bill
 - c. get angry; seek and offer support
 - d. seek and offer support; get angry
6. Enrico finds that no matter what else he is doing, he can't stop thinking about all the stressful events in his life. Enrico is experiencing _____.
 - a. catastrophizing
 - b. cognitive restructuring
 - c. functional fixedness
 - d. ruminative thinking

7. Caitlin just failed her high school math test. She says to herself, "Mom is going to be furious with me! She will probably ground me, which means I won't be able to go to the prom. If I don't go to the prom, I will be a social outcast, and no one will talk to me. I'll never have any friends or find a partner, and no one will ever love me!" This is an example of _____.
a. cognitive restructuring
b. catastrophizing
c. posttraumatic stress disorder
d. the fight-or-flight syndrome
8. Dr. Zarro finds that one of her patients, Juan, has a disease-resistant personality. This means that Juan is likely to _____.
a. ignore his stressors
b. be optimistic
c. blame himself for his stressors
d. ruminate about his stressors
9. Shane occasionally experiences flashbacks involving vivid recollections of his wartime experiences. Flashbacks are associated with _____.
a. generalized anxiety disorder
b. posttraumatic stress disorder
c. the general adaptation syndrome
d. the fight-flight reaction
10. When Robin didn't get the promotion he had been hoping for, he tried to laugh it off. He went out with friends and jokingly told them that it is all for the best because the promotion would have forced him to buy a lot of new clothes. Robin was using _____ coping strategies.
a. problem-focused
b. social-focused
c. emotion-focused
d. posttraumatic
11. Postsurgical patients who are allowed to adjust their own levels of pain medication tend to use less medication than patients who must ask for it. This phenomenon is consistent with research showing that _____.
a. social support can mediate stress
b. predictable stressors are easier to manage
c. the perception of control reduces the impact of stressors
d. thinking of stressors as threats amplifies their effects
12. Laton, the head of human resources at his company, knows that the employees have stressful jobs. He schedules group picnics and lunches to help employees get better acquainted. Laton is trying to ease the employees' stressors by _____.
a. promoting cognitive restructuring
b. improving social support
c. increasing employees' sense of control
d. helping employees think of their stressors as challenges rather than threats
13. The Focus on Research Methods section of this chapter described the relationship between personality and life expectancy. Researchers have found _____.
a. no significant relationship between the two
b. that conscientiousness was associated with longer life
c. that social relationships had no impact on longevity
d. that impulsiveness was associated with longer life
14. Porter has a flu virus. Research on the immune system shows that Porter's _____ will be especially important in working to fight off this virus.
a. red blood cells
b. adrenal medulla
c. natural killer cells
d. macrophages
15. Fred is at high risk for coronary heart disease. As his friend, you tell him that current research suggests that he could lower his risk if he _____.
a. takes up fishing as a hobby
b. works at being less hostile
c. reduces his workload
d. restructures his thinking about stress
16. When Larry is diagnosed with arthritis, he is very upset. His stress reactions are likely to be reduced *most* if Larry _____.
a. goes to a spa to try to ignore the situation
b. keeps his worries to himself
c. focuses all his attention on worrying about his medical condition
d. joins an arthritis support group
17. According to Rosenstock's health-belief model, which of the following would *most* help Bridgit decide to quit smoking?
a. Perceiving a personal threat of getting cancer from her smoking
b. Knowing that smoking causes cancer
c. Knowing that quitting can lower people's risk of cancer
d. Carefully reading the statistics on smoking and health in general
18. Amanda is severely overweight. She knows that for her health's sake, she needs to limit her caloric intake, but she loves to eat and has made no specific plans to go on a diet. Amanda is at the _____ stage of readiness to change a health-risk behavior.
a. precontemplation
b. contemplation
c. preparation
d. maintenance
19. Sayumi is trying to control her stress. In response to a hurtful comment from a friend, Sayumi thinks to herself, "Don't jump to conclusions; he probably didn't mean it the way it sounded," instead of "That jerk! Who does he think he is?" Sayumi is using the coping strategy of _____.
a. cognitive restructuring
b. emotional restructuring
c. catastrophizing
d. contemplation
20. Loretta, a marriage counselor, finds her job very stressful. She has found that physical coping strategies help her the most. This means that Loretta most likely _____.
a. constantly reminds herself about the good she is doing
b. organizes a support group for therapists
c. practices progressive relaxation every evening
d. works on her time-management plan

Personality



Tom Grill/Corbis

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Preview

If you've ever been stuck in heavy traffic, you have probably noticed differences in how drivers deal with the situation. Some are tolerant and calm; others become so cautious that they worsen the congestion; still others react with such impatience and anger that they may trigger a shouting match or cause an accident. Variations in

TRY THIS**Founder of Psychoanalytic Theory**

Here is Sigmund Freud with his daughter, Anna, who became a psychoanalyst herself and eventually developed a revised version of her father's theories.

Mary Evans/Sigmund Freud Copyrights/The Image Works

personality The pattern of psychological and behavioral characteristics by which each person can be compared and contrasted with other people.

psychoanalytic theory Freud's view that human behavior and personality are determined largely by psychological factors, many of which are unconscious.

psychodynamic approach A view developed by Freud that emphasizes unconscious mental processes in explaining human thought, feelings, and behavior.

how people handle traffic jams and other frustrating situations reflect just one aspect of their personalities—the consistent patterns of thinking, feeling, and behaving that make each person different from (and in some ways similar to) others. In this chapter, we examine four views of personality and review some of the personality tests psychologists have developed to measure and compare people's personalities. We also look at how our personalities interact with the situations in which we find ourselves. For example, being late for an important meeting might change the way in which you would normally handle being in a traffic jam. We also describe some of the ways that personality theory and research are being applied in areas such as diagnosing psychological disorders and screening potential employees.

Take out your wallet, look through it, and select the four most important things you carry with you. One person we know picked a driver's license, a credit card, a friend's phone number, and a witty prediction from a fortune cookie. The driver's license describes his physical traits. The credit card represents information about his buying history and responsibility in paying debts. His friends provide support, affection, and intimacy. And the fortune cookie prediction says something about his wishes, beliefs, or hopes. In other words, the selected items form a crude personality sketch.

There is no universally accepted definition, but psychologists generally view **personality** as the unique pattern of enduring thoughts, feelings, and actions that characterize a person. Personality research, in turn, seeks to understand how and why our consistent patterns of thinking, emotion, and behavior make each of us different in some ways and alike in others (Schultz & Schultz, 2013).

To gain a full understanding of just one individual's personality, a researcher would have to learn about many things, including the person's developmental experiences and cultural influences, genetic and other biological characteristics, perceptual and other information-processing habits and biases, typical patterns of emotional expression, and social skills. Psychologists also want to know about personality in general, such as how it develops and changes across the life span. They ask why some people are usually optimistic whereas others are usually pessimistic and whether people respond consistently or inconsistently from one situation to the next.

The specific questions psychologists ask and the methods they use to investigate personality often depend on which of the four main approaches to personality they take. These are the *psychodynamic*, *trait*, *social-cognitive*, and *humanistic* approaches.

THE PSYCHODYNAMIC APPROACH

How did paralyzed patients lead Freud to psychoanalysis?

Some people think that personality reveals itself in behavior alone. A person with an "obnoxious personality," for example, shows it by acting obnoxiously. But is that all there is to personality? Not according to Sigmund Freud. As a physician in Vienna, Austria, during the 1890s, Freud specialized in treating "neurotic" disorders. These were physical ailments, such as blindness or paralysis, for which there was no physical cause. Often, hypnosis could alleviate or remove these ailments. One patient sleepwalked on legs that were paralyzed during the day. Such cases led Freud to argue for *psychic determinism*, the idea that personality and behavior are determined more by psychological factors than by biological conditions or current events (Carducci, 2009). He proposed that people may not know why they feel, think, or act the way they do because they are partly controlled by an unconscious portion of personality—a part of which they are normally unaware (Friedman & Schustack, 2009; Funder, 2007). From these ideas Freud created **psychoanalytic theory**, a theory of personality that also led to a way of treating psychological disorders. Freud's theory became the basis of the **psychodynamic approach** to personality, which assumes that various unconscious psychological processes interact to determine our thoughts, feelings, and behavior (Engler, 2014).

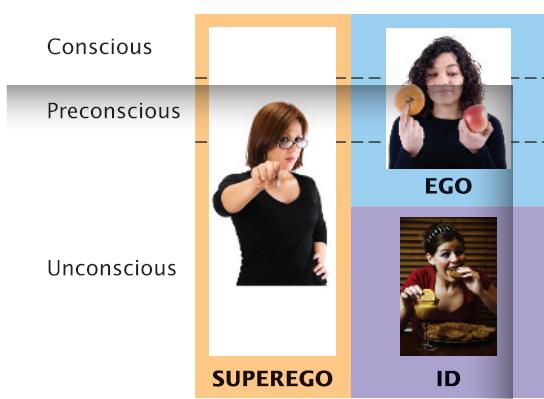


FIGURE 13.1

A Freudian View of Personality Structure

According to Freud, some parts of the personality are conscious, whereas others are unconscious. Between these levels is the preconscious, which Freud saw as the home of memories and other material that we are not usually aware of but that we can easily bring into consciousness.

Source: Adapted from Liebert & Spiegler (1994). Photos (clockwise from left): © Eduardo Fuentes Guevara/iStockphoto; © Ana de Sousa/Shutterstock; © Jamie Duplass/Shutterstock; © iStockphoto.com/edfuentesg; © Ana de Sousa/Shutterstock.com; © Jamie Duplass/Shutterstock.com

id According to Freud, a personality component containing basic instincts, desires, and impulses with which all people are born.

pleasure principle The operating principle of the id, which guides people toward whatever feels good.

ego According to Freud, the part of the personality that makes compromises and mediates conflicts between and among the demands of the id, the superego, and the real world.

reality principle The operating principle of the ego, which takes into account the constraints of the social world.

superego According to Freud, the component of personality that tells people what they should and should not do.

defense mechanisms Unconscious tactics that either prevent threatening material from surfacing or disguise it when it does.

The Structure of Personality

Freud concluded that people have certain basic impulses or urges, related not only to food and water but also to sex and aggression. Freud described these impulses and urges with a German word that translates as “instinct,” but he did not believe that they are all inborn and unchangeable, as the word *instinct* might imply (Ryckman, 2013). He did argue, though, that our desires for love, knowledge, security, and the like arise from more basic impulses. He said that each of us faces the task of figuring out how to satisfy basic urges in a world that often frustrates our efforts. Our personality develops, he claimed, as we struggle with that task, and it is reflected in the ways we go about satisfying a range of urges.

Id, Ego, and Superego

Freud described the personality as having three major components: the id, the ego, and the superego (Cervone & Pervin, 2013; see Figure 13.1). The **id** represents the inborn, unconscious portion of the personality where life and death instincts reside. The *life instincts* promote positive, constructive behavior; the *death instincts* are responsible for human aggression and destructiveness (Fiest et al., 2013). The id operates on the **pleasure principle**, seeking immediate satisfaction of both kinds of instincts, regardless of society’s rules or the rights and feelings of others. The hungry person who pushes to the front of the line at Burger King would be satisfying an id-driven impulse.

As parents, teachers, and others place ever greater restrictions on the expression of id impulses, a second part of the personality, called the **ego** (or “self”), emerges from the id. The **ego** is responsible for organizing ways to get what a person wants in the real world, as opposed to the fantasy world of the id. Operating on the **reality principle**, the ego makes compromises as the id’s demands for immediate satisfaction run into the practical realities of the social world. The ego would influence that hungry person at Burger King to wait in line and think about what to order rather than risk punishment by pushing ahead.

As children gain experience with the rules and values of society, they tend to adopt them. This process of *internalizing* parental and cultural values creates the third component of personality. It is called the **superego**, and it tells us what we should and should not do. The superego becomes our moral guide, and it is just as relentless and unreasonable as the id in its demands to be obeyed. The superego would make the person at Burger King feel guilty for even thinking about violating culturally approved rules about waiting in line.

Conflicts and Defenses

Freud described the inner clashes among id, ego, and superego as *intrapsychic*, or *psycho-dynamic, conflicts*. He believed that each individual’s personality is shaped by the number, nature, and outcome of these conflicts. Freud said that the ego’s main job is to prevent the anxiety or guilt that would arise if we became conscious of socially unacceptable id impulses, especially those that would violate the superego’s rules (Schultz & Schultz, 2013). Sometimes the ego guides sensible actions, as when people ask for help once they realize they have a drinking problem. However, the ego also uses **defense mechanisms**, which are unconscious tactics that protect against anxiety and guilt by either preventing threatening material from surfacing or disguising it when it does (Feist et al., 2013; see Table 13.1).

Stages of Personality Development

Freud proposed that during childhood, personality evolves through several stages of **psychosexual development**. Failure to resolve the conflicts that appear at any of these stages can leave a person *fixated*—that is, unconsciously preoccupied with the area of pleasure associated with that stage. Freud believed that the stage at which a person became fixated in childhood can be seen in the person’s adult personality characteristics.

TABLE 13.1 EGO DEFENSE MECHANISMS

TRY THIS According to Freud, defense mechanisms prevent anxiety or guilt in the short run. They may also help us choose creative or adaptive actions in potentially upsetting situations (e.g., Kim, Zeppenfeld, & Cohen, 2014). But ego defense mechanisms may cause difficulties when we use them to avoid dealing with the source of our problems, which can make those problems worse in the long run. Try listing some incidents in which you or someone you know might have used each of the defenses described here. What questions would a critical thinker ask to determine whether these behaviors were unconscious defense mechanisms or actions motivated by conscious intentions?

Defense Mechanism	Description
Repression	Unconsciously pushing threatening memories, urges, or ideas from conscious awareness: a person may experience loss of memory of unpleasant events.
Rationalization	Attempting to make actions or mistakes seem reasonable: the reasons or excuses given (e.g., "I spank my children because it is good for them") sound rational, but they are not the real reasons for the behavior.
Projection	Unconsciously attributing one's own unacceptable thoughts or impulses to another person: instead of recognizing that "I hate him," a person may feel that "He hates me."
Reaction formation	Defending against unacceptable impulses by acting opposite to them: sexual interest in a married co-worker might appear as strong dislike instead.
Sublimation	Converting unacceptable impulses into socially acceptable actions and perhaps symbolically expressing them: sexual or aggressive desires may appear as artistic creativity or devotion to athletic excellence.
Displacement	Deflecting an impulse from its original target to a less threatening one: anger at one's boss may be expressed through hostility toward a clerk, a family member, or even a pet.
Denial	Simply discounting the existence of threatening impulses: a person may vehemently deny ever having had even the slightest degree of physical attraction to a person of the same sex.
Compensation	Striving to make up for unconscious impulses or fears: a business executive's extreme competitiveness might be aimed at compensating for unconscious feelings of inferiority.

TRY THIS Which of Freud's ego defense mechanisms is operating here? (Check the answer at the bottom of page 462).

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psychosexual development Periods of personality development in which, according to Freud, internal and external conflicts focus on particular issues.

oral stage The first of Freud's psychosexual stages, in which the mouth is the center of pleasure.

The Oral Stage

In Freud's theory, a child's first year or so is called the **oral stage** because the mouth—which infants use to eat and to explore everything from toys to their own hands and feet—is the center of pleasure during this period. Personality problems arise, said Freud, when oral needs are either neglected or overindulged. For example, early or late weaning from breastfeeding or bottle-feeding may leave a child fixated at the oral stage. The resulting adult characteristics may range from overeating or childlike dependence (late weaning) to the use of “biting” sarcasm (early weaning).



The Oral Stage

According to Freud, personality develops in a series of psychosexual stages. At each stage, a different part of the body becomes the primary focus of pleasure. This baby would appear to be in the oral stage.

Big Cheese Photo RF/Jupiterimages

anal stage The second of Freud's psychosexual stages, in which the focus of pleasure shifts from the mouth to the anus.

phallic stage The third of Freud's psychosexual stages, in which the focus of pleasure shifts to the genital area.

Oedipal complex The notion that young boys' impulses involve sexual feelings for the mother and the desire to eliminate the father.

Electra complex The notion that young girls develop an attachment to the father and compete with the mother for the father's attention.

latency period The fourth of Freud's psychosexual stages, in which sexual impulses become dormant and the child focuses on education and other matters.

genital stage The fifth and last of Freud's psychosexual stages, when sexual impulses reappear at the conscious level during adolescence.

The Anal Stage

The **anal stage** occurs during the second year, when the child's ego develops to cope with parental demands for socially appropriate behavior. For example, in most Western cultures, toilet training clashes with the child's freedom to have bowel movements at will. Freud said that if toilet training is too harsh or begins too early, it can produce an anal fixation that leads, in adulthood, to stinginess or excessive neatness (symbolically withholding feces). If toilet training is too late or too lax, however, the result could be a kind of anal fixation that is reflected in adults who are disorganized or impulsive (symbolically expelling feces).

The Phallic Stage

According to Freud, between the ages of three and five the focus of pleasure shifts to the genital area. Because he emphasized the psychosexual development of boys, Freud called this period the **phallic stage** (*phallus* is another word for penis). It is during this stage, he claimed, that the boy experiences sexual feelings for his mother and a desire to eliminate, or even kill, his father, with whom the boy competes for the mother's affection. Freud called this set of impulses the **Oedipal complex** because it reminded him of the plot of the classical Greek play *Oedipus Rex*. (In the play, Oedipus unknowingly kills his father and marries his mother.) The boy's fantasies create so much fear, however, that the ego represses his incestuous desires and leads him to "identify" with his father and try to be like him. In the process, the child's superego begins to develop.

According to Freud, a girl begins the phallic stage with a strong attachment to her mother. However, when she realizes that boys have penises and girls don't, she supposedly develops *penis envy* and transfers her love to the father. (This sequence has been called the **Electra complex** because it echoes the plot of *Electra*, another classical Greek play, but Freud never used this term.) To avoid her mother's disapproval, the girl identifies with and imitates her, thus forming the basis for her own superego.

Freud believed that unresolved conflicts during the phallic stage create a fixation that is reflected in many kinds of adult problems. These problems can include difficulties with authority figures and an inability to maintain a stable love relationship.

The Latency Period

As the phallic stage draws to a close and its conflicts are coped with by the ego, there is an interval of psychological peace. During this **latency period**, which lasts through childhood, sexual impulses stay in the background as the youngster focuses on education, same-sex peer play, and the development of social skills.

The Genital Stage

During adolescence, when sexual impulses reappear at the conscious level, the genitals again become the focus of pleasure. Thus begins what Freud called the **genital stage**, which lasts for the rest of the person's life. The quality of relationships and the degree of fulfillment experienced during this final stage, he claimed, are influenced by how intrapsychic conflicts were resolved during the earlier stages.

Variations on Freud's Personality Theory

Freud's ideas—especially those concerning infantile sexuality and the Oedipal complex—were (and still are) controversial. Even many of Freud's followers did not entirely agree with him. Some of these followers are known as *neo-Freudian* theorists because they

The defense mechanism illustrated in the cartoon on page 461 is displacement.



An Early Feminist

After completing medical school at the University of Berlin in 1913, Karen Horney (1885–1952) trained as a Freudian psychoanalyst. She accepted some aspects of Freud's views, including the idea of unconscious motivation, but she eventually developed her own neo-Freudian theory. She saw the need for security as more important than biological instincts in motivating infants' behavior.

Bettmann/Corbis

employed many aspects of Freud's theory but developed their own approaches. Others are known as *ego psychologists* because their theories focus more on the ego than on the id (Engler, 2014).

Neo-Freudian Theorists

Carl Jung (pronounced "YOONG") was the most prominent of Freud's early followers to chart his own theoretical course. In developing his ideas about *analytic psychology*, Jung (1916) argued that people are born with a general life force that (in addition to a sex drive) includes a drive for creativity, for growth-oriented resolution of conflicts, and for the productive blending of basic impulses with real-world demands. Jung did not identify specific stages in personality development. He suggested instead that people gradually develop differing degrees of *introversion* (a tendency to reflect on one's own experiences) or *extraversion* (a tendency to focus on the social world) along with differing tendencies to rely on specific psychological functions, such as thinking or feeling. The combination of these tendencies and functions, said Jung (1933), creates personalities that show distinctive and predictable patterns of behavior.

Alfred Adler, once a loyal follower of psychoanalysis, came to believe that the power behind the development of personality comes not from id impulses but from an innate desire to overcome infantile feelings of helplessness and gain some control over the environment. Other prominent neo-Freudians emphasized social relationships in the development of personality. Some, including Erik Erikson, Erich Fromm, and Harry Stack Sullivan, argued that once biological needs are met, the attempt to meet social needs (to feel protected, secure, and accepted, for example) is the main force that shapes personality. According to these theorists, the strategies that people use to meet social needs, such as dominating other people or being dependent on them, become core features of their personalities.

The first feminist personality theorist, Karen Horney (pronounced "HORN-eye"), challenged Freud's view that women's lack of a penis causes them to envy men and feel inferior to them. Horney (1937) argued that it is men who envy women. Realizing that they cannot bear children, males see their lives as having less meaning and substance than women's. Horney called this condition *womb envy*, and she felt that it led men to belittle women. She believed that when women feel inferior, it is because of cultural factors—such as the personal and political restrictions that men have placed on them—not because of penis envy (Hergenhahn & Olson, 2011; Larsen & Buss, 2005).

Contemporary Psychodynamic Theories

Today, some of the most influential psychodynamic approaches to personality focus on *object relations*—that is, on how early relationships, particularly with parents, affect how people perceive and relate to other people later in life (Cervone & Pervin, 2013). According to object relations theorists, early relationships between infants and their love objects (usually the mother and other primary caregivers) are vital influences on the development of personality (e.g., Klein, 1975; Kohut, 1984; Sohlberg & Jansson, 2002). These relationships, they say, shape our thoughts and feelings about social relationships in later life (Funder, 2012).

A close cousin of object relations theory is called *attachment theory* because it focuses specifically on the early attachment process that we describe in the chapter on human development. Ideally, infants form a secure bond, or attachment, to their mothers, gradually tolerate separation from this "attachment object," and eventually develop the ability to relate to others as independent, secure individuals (Ainsworth & Bowlby, 1991). Attachment theorists have studied how variations in the nature of this early bond are related to differences in people's personalities, self-images, identities, security, and social relationships in adolescence, adulthood, and even old age (e.g., Fraley et al., 2013; Mikulincer, Shaver, & Berant, 2013; Simpson, Collins, & Salvatore, 2014). One study, for example,

found that insecure attachment during infancy was associated with less-happy romantic relationships later on (Tomlinson et al., 2010). Others have found that people who had had insecure attachments showed much stronger physiological reactions to interpersonal conflicts than did people whose attachments had been secure (Powers et al., 2006), and that people with insecure early attachments were less likely than those with secure attachments to be helpful when encountering a person in distress (Mikulincer & Shaver, 2005). People with insecure attachment styles are also more at risk for psychological disorders (Palitsky, et al., 2013).

Further evidence about the influence of attachment comes from a long-term study of children diagnosed with severe heart disease. The children whose mothers had not been securely attached to their own mothers tended to show more anxiety and other emotional difficulties in the years after the diagnosis than did those whose mothers had been more securely attached (Berant, Mikulincer, & Shaver, 2008). Also, cancer patients with insecure attachment styles appear to trust their physicians less and to be less satisfied with treatment (Holwerda et al., 2013). In short, attachment theorists suggest that people who miss the opportunity to become securely attached may suffer significant disturbances in their later relationships (Esbjørn et al., 2013), including in relationships with their own children.

Evaluating the Psychodynamic Approach

Freud's personality theory may be the most comprehensive and influential psychological theory ever proposed, and it is still influential worldwide (Osnos, 2011). His ideas have shaped a wide range of psychotherapy techniques (see the chapter on treatment of psychological disorders) and stimulated the development of several personality assessments, including the projective personality measures described later in this chapter. Research on cognitive processes supports some of Freud's ideas. For example, people do use several of the defense mechanisms Freud described (Diehl et al., 2014), although these may not always operate at an unconscious level. There's also evidence that our thoughts and actions can be influenced by events and experiences that we don't recall (Bargh et al., 2012) and possibly by emotions we don't consciously experience (Williams et al., 2009). Some researchers believe that unconscious processes can also affect our health (Goldenberg et al., 2008; Krieger et al., 2010). Research confirms that early experiences do influence brain development, and some researchers have suggested this line of inquiry may eventually identify the neurological underpinnings of some of the drives (e.g., libido) proposed by Freud (Engler, 2014).

However, Freud's theories have several weaknesses. For one thing, his conclusions about personality are based almost entirely on case studies of a few individuals. As discussed in the introductory chapter, conclusions drawn from case studies may not apply to people in general. Freud's sample of cases was certainly not representative of people in general. Most of his patients were upper-class Viennese women who not only had psychological problems but were raised in a society that considered the discussion of sex to be uncivilized. Second, Freud's theory reflected Western European and North American cultural values, which may or may not be helpful in understanding people in other cultures (Schultz & Schultz, 2013). For example, the concepts of ego and self that are so central to Freud's personality theory are based on the self-oriented values of individualist cultures. These values may be less central to personality development in collectivist cultures, such as those of Asia and South America (Park & Kitayama, 2012).

Freud's conclusions may have been distorted by other biases as well. Some Freud scholars believe he might have (perhaps unconsciously) modified reports of what happened during therapy to better fit his theory (Schultz & Schultz, 2013). He may also have asked leading questions that influenced patients to "recall" events from their childhoods that never happened (Carducci, 2009). Today, as described in the memory chapter, there are similar concerns that some patients who recover allegedly repressed memories about

childhood sexual abuse may actually be reporting false memories implanted by therapists (Patihis, Tingen, & Loftus, 2013).

Other critics have noted that Freud's theories focus too much on men's psychosexual development and largely ignore women (Engler, 2014; Feist et al., 2013). His notion that females envy male anatomy has also been attacked. In the tradition of Horney, some contemporary neo-Freudians have proposed theories that focus specifically on the psychosexual development of women (Miletic, 2002).

Finally, as judged by modern standards, Freud's theory is not very scientific. His definitions of id, ego, unconscious conflict, and other concepts lack the precision required to allow researchers to test these ideas scientifically (Funder, 2012). Further, his belief that unconscious desires drive most human behavior ignores evidence showing that much of that behavior goes beyond impulse gratification. For example, the conscious drive to attain personal, social, and spiritual goals is an important determinant of behavior, as is learning from others.

Some of the weaknesses in Freudian theory have been addressed by theorists who have altered some of Freud's concepts and devoted more attention to social influences on personality. Attempts have also been made to increase precision and objectivity in the measurement of psychodynamic concepts (e.g., Barber, Crits-Christoph, & Paul, 1993). Research on concepts from psychodynamic theory is, in fact, becoming more sophisticated and increasingly reflects interest in subjecting psychodynamic principles to empirical tests (e.g., Betan & Westen, 2009; Roffman & Gerber, 2008). For example, researchers are exploring the brain activities that accompany some of the mental operations that are central to Freud's theories (Bernstein, 2011). Still, the psychodynamic approach is better known for generating hypotheses about personality than for scientifically testing them. Accordingly, this approach to personality is now much less influential in mainstream psychology than it was in the past (Feist et al., 2013; Schultz & Schultz, 2013).

THE TRAIT APPROACH

What personality traits are most basic?

You might describe the personality of someone you know well with just a few statements. For example, you might say,

He's a really caring person, and very outgoing. He's generous with his time, and he works very hard at everything he does. Yet sometimes I think he also lacks self-confidence. He always gives in to other people's demands because he wants to be accepted by them.

In other words, most people describe others by referring to the kind of people they are ("outgoing"); to the thoughts, feelings, and actions that are most typical of them ("caring," "lacks self-confidence"); or to their needs ("wants to be accepted"). Together, these statements describe **personality traits**—the tendencies that help direct how a person usually thinks and behaves (Cervone & Pervin, 2013).

The trait approach to personality makes three main assumptions:

1. Personality traits are relatively stable, and therefore predictable, over time. So a gentle person tends to stay that way day after day, year after year (Cervone & Pervin, 2013).
2. Personality traits are relatively stable across situations, and they can explain why people act in predictable ways in many different situations. A person who is competitive at work will probably also be competitive on the tennis court or at a party (Roberts, Woods, & Caspi, 2008).
3. People differ in how much of a particular personality trait they possess; no two people are exactly alike on all traits. The result is an endless variety of unique personalities.

In short, psychologists who take the **trait approach** see personality as a combination of stable internal characteristics that people display consistently over time and across

personality traits A set of stable characteristics that people display over time and across situations.

trait approach A perspective on personality that views it as the combination of stable characteristics that people display over time and across situations.

FIGURE 13.2
Two Personality Profiles

TRY THIS Trait theory describes personality in terms of the strength of particular dimensions, or traits. Here are trait profiles for Bob, a computer engineer, and Ted, a stock trader. Compared with Ted, Bob is about equally industrious, more generous, and less nervous, extraverted, and aggressive. Just for fun, score yourself to indicate how strong you think you are on each of the listed traits. Trait theorists suggest that it should be easy for you to do this, because virtually everyone displays a certain amount of almost any personality characteristic.

Source: From McCrae & John, "An Introduction to the five-factor model and its applications," *Journal of Personality* vol 60 (pp. 175–215). John Wiley & Sons, 1992; © gyn9037/Shutterstock.com; © Monkey Business Images/Shutterstock.com



situations (Pervin, Cervone, & John, 2005). Trait theorists try to measure the relative strength of the many personality characteristics that they think may be present in everyone (see Figure 13.2).

Early Trait Theories

Today's trait theories of personality are largely based on the work of Gordon Allport, Raymond Cattell, and Hans Eysenck. Allport spent 30 years searching for the traits that combine to form personality. When he looked at the nearly 18,000 dictionary terms used to describe human behavior (Allport & Odbert, 1936; John, Naumann, & Soto, 2008), he noticed clusters of terms that refer to the same thing. For example, *hostile*, *nasty*, and *mean* all convey a similar meaning. To better understand this clustering, think of a close relative and jot down all the personality traits that describe this person. If you are like most people, you were able to capture your relative's personality using only a few trait labels. Allport believed that the set of labels that describe a particular person reflects that person's *central traits*—those that are usually obvious to others and that organize and control behavior in many different situations. Central traits are roughly equivalent to the descriptive terms used in letters of recommendation (*reliable* or *distractible*, for example) that are meant to tell what can be expected from a person most of the time (Schultz & Schultz, 2009). Allport also believed that people possess *secondary traits*—those that are more specific to certain situations and control far less behavior. "Dislikes crowds" is an example of a secondary trait.

Allport's research helped lay the foundation for modern research on personality traits. His focus on the uniqueness of each personality made it difficult to draw conclusions about the structure of personality in general (Barenbaum & Winter, 2008), but some researchers today continue to employ a modern version of Allport's approach (e.g., Caldwell, Cervone, & Rubin, 2008).

In contrast, British psychologist Raymond Cattell was interested in the personality traits that people share. He used a mathematical technique called *factor analysis* to study which traits are correlated with one another. Factor analysis can reveal, for example, whether people who are moody are also likely to be anxious, rigid, and unsociable. Cattell found sixteen clusters of traits that he believed make up the basic dimensions, or factors, of personality, and he measured their strength across individuals using a test called the Sixteen Personality Factor Questionnaire, or 16PF (Cattell, Eber, & Tatsuoka, 1970).

TRY THIS

Selecting a Jury

Some psychologists employ trait theories of personality in advising prosecution or defense attorneys about which potential jurors are most likely to be sympathetic to their side of a court case.

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The Five-Factor Personality Model

Building on the work of Allport and Cattell, factor analytic research by many of today's trait theorists suggests that personality is organized around just five basic dimensions (McCrae & Costa, 2004, 2008). The dimensions of this **five-factor (or Big Five) personality model** have been given slightly different labels by different researchers, but the most widely used names are *openness*, *conscientiousness*, *extraversion*, *agreeableness*, and *neuroticism* (see Table 13.2). The fact that some version of the Big Five factors reliably appears in many countries and cultures provides evidence that these factors may indeed represent the most important components of human personality (De Fruyt et al., 2009; McCrae, Terracciano, & Profiles of Cultures Project, 2005). Some researchers have used MRI and other scanning techniques to see if activities in specific brain regions are associated with each of these factors (DeYoung et al., 2010), but these efforts are controversial and have not yielded clear results (Liu et al., 2013).

Many trait theorists consider the emergence of the five-factor personality model to be a major breakthrough in examining the personalities of all people, regardless of where they live or the nature of their economic, social, and cultural backgrounds (Carver & Scheier, 2004; John, Naumann, & Soto, 2008). The model also allows researchers to describe in a precise way the similarities and differences in people's personalities and to explore how these factors are related to everything from personality disorders and political beliefs to substance abuse, academic and occupational performance, happiness, physical well-being, driving skills, and even voting behavior (e.g., Adrian et al., 2011; Boyce & Wood, 2011; Boyce et al., 2010; Chiaburu et al., 2011; Cuperman & Ickes, 2009; Friedman, Kern, & Reynolds, 2010; Hughes et al., 2012; Mottus, Kuh, & Deary, 2013; Vianello, Robusto, & Anselmi, 2010; Vecchione et al., 2011).

TABLE 13.2 DIMENSIONS OF THE FIVE-FACTOR PERSONALITY MODEL

Here is a list of the adjectives that define the Big Five personality factors. You can more easily remember these factors by noting that the first letters of their names spell the word *ocean*.

Dimension	Defining Descriptors
Openness	Artistic, curious, imaginative, insightful, original, wide interests, unusual thought processes, intellectual interests
Conscientiousness	Efficient, organized, planful, reliable, thorough, dependable, ethical, productive
Extraversion	Active, assertive, energetic, outgoing, talkative, gesturally expressive, gregarious
Agreeableness	Appreciative, forgiving, generous, kind, trusting, noncritical, warm, compassionate, considerate, straightforward
Neuroticism	Anxious, self-pitying, tense, emotionally unstable, impulsive, vulnerable, touchy, prone to worry

Source: Adapted from McCrae & John (1992).

five-factor personality model (Big Five model) A view based on studies using factor analysis that suggests the existence of five basic components of human personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism.



Animal Personalities

The idea that personality can be described using five main dimensions may hold for some animals as well as humans. The five animal dimensions differ from (but are still related to) human traits. For example, hyenas differ among themselves in terms of dominance, excitability, agreeableness (toward people), sociability (toward each other), and curiosity. Some of these same traits have been observed in a wide variety of other species, including sheep, langurs, orangutans, chipmunks, and chimpanzees (e.g., Bell & Sih, 2007; Martin & Réale, 2008; Michelena et al., 2009; Weinstein, Capitanio, & Gosling, 2008). Dog and cat lovers often report such traits in their pets, too (e.g., Ley, Bennett, & Coleman, 2009). Researchers have even begun to develop personality tests for nonhuman primates, dogs, and other animals (Freeman et al., 2013).

uweSERENGETI/Alamy

Biological Trait Theories

While some personality theorists study the basic dimensions of personality, others explore the biological factors that shape and influence those dimensions.

Eysenck's Biological Trait Theory

The biological basis for personality was emphasized in the work of British psychologist Hans Eysenck (pronounced “EYE-sink”). Like other trait theorists who helped lay the groundwork for the five-factor personality model, Eysenck used factor analysis to study personality. His research led him to focus on two main personality dimensions known as *introversion-extraversion* and *emotionality-stability* (Eysenck, 1990a, 1990b; Deary & Bedford, 2011):

1. **Introversion-extraversion.** Extraverts are sociable and outgoing, enjoy parties and other social activities, take risks, and love excitement and change. Introverts tend to be quiet, thoughtful, and reserved, enjoying solitary pursuits and avoiding social involvement.
2. **Emotionality-stability** (also often called *neuroticism*). At one extreme of this dimension are people who exhibit such characteristics as moodiness, restlessness, worry, anxiety, and other negative emotions. People at the opposite end are calm, even-tempered, relaxed, and emotionally stable.

According to Eysenck, personality can be described in terms of where a person falls along these two dimensions. For example, an introverted but stable person is likely to be controlled and reliable. An introverted but emotional person is likely to be rigid and anxious (see Figure 13.3). Eysenck's personality dimensions do seem to be related to particular behaviors. For example, college students' levels of neuroticism, extraversion, and psychotism (a third dimension described by Eysenck) have been shown to be related to the students' passion for Internet use and how much they reveal about themselves online (Tosun & Lajunen, 2009, 2010)

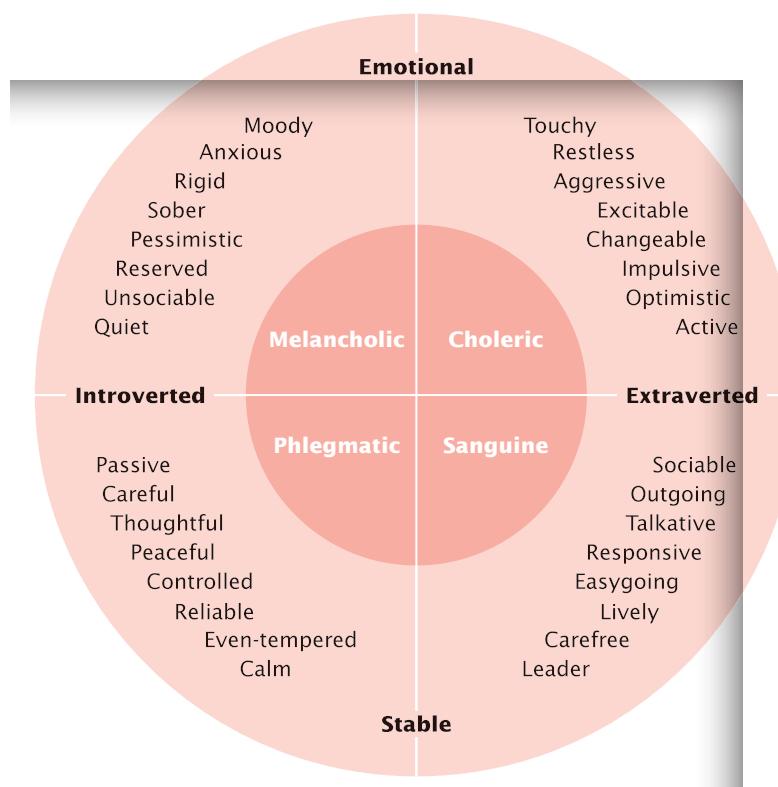


FIGURE 13.3
Eysenck's Personality Dimensions

TRY THIS According to Eysenck, varying degrees of emotionality-stability and introversion-extraversion combine to produce predictable trait patterns. The traits appearing in the four sections created by crossing these two personality dimensions roughly define the four basic temperaments identified centuries ago by the ancient Greek physician Hippocrates: melancholic (sad), choleric (hot-tempered), phlegmatic (slow and lethargic), and sanguine (optimistic). Which section of the figure do you think best describes your personality traits? How about those of a friend or a relative? Did you find it any easier to place other people's personalities in a particular section than it was to place your own personality? If so, why do you think that might be?

LINKAGES Why do some people take more risks than others? (a link to Motivation and Emotion)

Eysenck argued that the variations in personality characteristics that we see among individuals can be traced to inherited biological differences. These biological differences, he said, create differences in people's typical levels of physiological arousal and in their sensitivity to stress and other environmental stimulation. For example, people who inherit a nervous system that normally operates below some ideal level of arousal will always be on the lookout for excitement, change, and social contact in order to increase their arousal. As a result, they will be *extraverted*. In contrast, people whose nervous system is normally "overaroused" will tend to avoid excitement, change, and social contact in order to reduce arousal to their ideal level. In short, they will be *introverted*. What about the emotionality-stability dimension? Eysenck said that people who fall toward the stability side have nervous systems that are relatively insensitive to stress; those who are more emotional have nervous systems that react more strongly to stress.

Gray's Reinforcement Sensitivity Theory

Jeffrey Gray, another British psychologist, agrees with Eysenck about the two basic dimensions of personality but offers a different explanation of how biology underlies them (Johnson et al., 2012; Gray & McNaughton, 2002). According to Gray's *reinforcement sensitivity theory*, differences among people along the dimensions of introversion-extraversion and emotionality-stability originate in the brain regions that influence how sensitive people are to different kinds of events. These regions are called the behavioral approach system and the flight or freeze system (Johnson et al., 2012).

The *behavioral approach system* (BAS) affects people's sensitivity to rewards and their motivation to seek these rewards. The BAS has been called a "go" system because it is responsible for how impulsive or uninhibited a person is. The *flight or freeze system* (FFS) affects how sensitive people are to punishment (Smillie, Pickering, & Jackson, 2006). The FFS is a "stop" system that is responsible for how fearful or inhibited a person is (Bijttebier et al., 2009). Gray sees extraverts as having a sensitive reward system (BAS) and an insensitive punishment system (FFS). Introverts are just the opposite: they are relatively insensitive to rewards but highly sensitive to punishment. Emotionally unstable people are much more sensitive to both rewards and punishments than are those who are emotionally stable. One study found that individual differences in the FFS versus BAS systems predicted the heights that various mountaineers were able to reach in their attempts to scale Mount Everest. Those with greater reward responsiveness (a BAS feature) and less pre-climb anxiety (a FFS feature) were more likely to reach the summit (Feldman et al., 2013).

Gray's theory has its critics (e.g., Jackson, 2003; Matthews, 2008), but it is now more widely accepted than Eysenck's theory—primarily because it is supported by more data (e.g., Revelle, 2008) and it seems more consistent with what neuroscientists have learned about brain structures and neurotransmitters and how they operate (e.g., Joseph et al., 2009; Read et al., 2010).

THINKING CRITICALLY ARE PERSONALITY TRAITS INHERITED?

Gray's reinforcement sensitivity theory is one of several biologically oriented explanations of the origins of personality traits (e.g., Loehlin & Martin, 2013; Turkheimer, Pettersson, & Horn, 2014). A related approach explores the role of genetics in these traits (e.g., Loehlin, 2011; Terracciano et al., 2010). For example, consider a pair of identical twins who were separated at five weeks of age and did not meet for thirty-nine years. Both drove Chevrolets, chain-smoked the same brand of cigarettes, had divorced a woman named Linda, were remarried to a woman named Betty, had sons named James Allan, had dogs named Toy, enjoyed similar hobbies, and had served as sheriff's deputies (Tellegen et al., 1988).

(continued)

What am I being asked to believe or accept?

Cases like this suggest that some core aspects of personality might be partly or even largely inherited (Ekehammar et al., 2010; Turkheimer & Harden, 2014).

What evidence is available to support the assertion?

Other evidence for this assertion comes from the many anecdotal cases in which children seem to "have" their parents' or grandparents' bad temper, generosity, or shyness. Systematic studies have also found moderate but significant correlations between children's personality test scores and those of their parents and siblings (Turkheimer et al., 2014).

Even stronger evidence comes from studies around the world that compare identical twins raised together, identical twins raised apart, nonidentical twins raised together, and nonidentical twins raised apart (Turkheimer et al. 2014). Whether they are raised apart or together, identical twins (who have exactly the same genes) tend to be more alike in personality than nonidentical twins (whose genes are no more similar than those of other siblings). This research also shows that identical twins are more alike than nonidentical twins in general temperament, such as how active, sociable, anxious, and emotional they are, and where they fall on various other personality dimensions (e.g., Kandler, et al., 2010; Johnson et al., 2009). Using such twin studies, behavioral geneticists have concluded that about 50 percent of the differences among people in terms of personality traits are due to genetic factors (Caspi, Roberts, & Shiner, 2005; Kreuger et al., 2008).

Are there alternative ways of interpreting the evidence?

Family resemblances in personality could reflect inheritance or social influence. So an obvious alternative interpretation of this evidence might be that family similarities come not from common genes but from a shared environment (Rentfrow, 2010). Children learn many rules, skills, and behaviors by watching parents, siblings, and others; perhaps they learn their personalities as well (Funder, 2007). And the fact that nontwin siblings are less alike than twins may well result from what is called a *nonshared environment* (Plomin, 2004). Nonshared factors include, for example, a child's place in the family birth order; differences in the way parents treat each of their children; and accidents, illnesses, or events that alter a particular child's life or health (Loehlin, 2011). Nontwins are more likely than twins, especially identical twins, to experience these nonshared environmental factors.

What additional evidence would help evaluate the alternatives?

One way to evaluate the extent to which personality is inherited would be to locate genes that are associated with certain personality characteristics (Ebstein, 2006). Genetic differences have already been tentatively associated with certain behavior disorders, but most behavioral genetics researchers doubt that there are direct links between particular genes and particular personality traits (Caspi, Roberts, & Shiner, 2005; Kreuger & Johnson, 2008).

Another way to evaluate the role of genes in personality is to study people in infancy, before the environment has had a chance to exert its influence. If the environment were entirely responsible for personality, newborns should be essentially alike. However, as discussed in the chapter on human development, infants show immediate differences in activity level, sensitivity to the environment, the tendency to cry, and interest in new stimuli (Olino et al., 2013; Slutske et al., 2012). These differences in *temperament* suggest biological and perhaps genetic influences.

To evaluate the relative contributions of nature and nurture beyond infancy, psychologists have examined the personality characteristics of adopted children. If adopted children are more like their biological than their adoptive parents, this suggests the influence of heredity in personality. If they are more like their adoptive families, a strong role for environmental factors in personality is suggested. In actuality, adopted children's personalities tend to resemble the personalities of their biological parents and siblings more closely than they do those of the families in which they are raised (Turkheimer et al., 2014).

Other research seeks to determine more clearly which aspects of the environment are most important in shaping personality (Turkheimer & Waldron, 2000). So far, the evidence suggests that personality is not influenced very strongly by elements of the shared environment—such

(continued)



Family Resemblance

Do children inherit personality traits in the same direct way as they inherit facial features, coloration, and other physical characteristics? Research in behavioral genetics suggests that personality is the joint product of genetically influenced behavioral tendencies and the environmental conditions each child encounters.

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as socioeconomic status—that equally affect all children in the same family. However, nonshared environmental influences, at home and elsewhere, may be very important in personality development (Loehlin, 2011). We need to know more about the exact impact on personality development of nonshared environmental factors that may be different for twins and nontwin siblings

What conclusions are most reasonable?

Even those researchers who strongly support genetic theories of personality caution that we should not replace “simple-minded environmentalism” with the equally incorrect view that personality is almost completely biologically determined (Loehlin, 2010). It is pointless to talk about heredity *versus* environment as causes of personality, because nature and nurture always intertwine to exert joint and simultaneous influences (Kreuger & Johnson, 2008). For example, we know that genetic factors affect the environment in which people live (e.g., their families) and how they react to that environment, but as discussed in the introductory chapter, research in epigenetics has shown that environmental factors can influence which of a person’s genes are activated (or “expressed”) and how much those genes affect the person’s behavior (Cole, 2013; Manuck & McCaffery, 2014). The impact of epigenetics on personality research is illustrated by the recent finding that the chromosomes that contain our genes get slightly shorter in older people with more pessimistic personalities (Ikeda et al., 2014).

In short, we can draw only tentative conclusions about the origins of personality differences. The evidence available so far suggests that genetic influences do appear to contribute significantly to the differences among people in many personality traits (DeYoung et al., 2007; Vernon et al., 2008). As noted earlier, though, there is no evidence of a specific gene directly responsible for a specific personality trait (Manuck & McCaffery, 2014). The genetic contribution to personality most likely comes as genes influence people’s nervous systems and general predispositions toward certain temperaments (Alliey-Rodriguez et al., 2011; Blom et al., 2011). Temperamental factors (e.g., emotionality and sociability) then interact with environmental factors, such as family experiences, to produce specific features of personality (Slutske, et al. 2012). For example, a child’s ability to control or regulate emotions appears to be strongly determined by heredity. Children who are less able to regulate their emotions might play less with other children, withdraw more from social interactions, and thereby fail to learn important social skills (Spinrad et al., 2006). These experiences and tendencies, in turn, might foster the self-consciousness and shyness seen in introverted personalities. Genes also appear to influence people’s emotional responses to specific events, such as how they respond to socioeconomic adversity or other negative environmental conditions (Cole et al., 2011).

Notice, though, that genetic predispositions toward particular personality characteristics may or may not be expressed in behavior, depending on whether the environment supports or stifles them. Changes in genetically predisposed traits are not only possible but may actually be quite common as children grow (Cacioppo et al., 2000). So even though there is a strong genetic basis for shyness, many children learn to overcome this tendency and become quite outgoing (Volbrecht & Goldsmith, 2010). In summary, rather than inheriting specific traits, people appear to inherit the behavioral and emotional raw materials out of which their personalities are shaped by the world.

Evaluating the Trait Approach

The trait approach, and especially the five-factor personality model, tends to dominate contemporary research in personality. Yet there are several problems and weaknesses associated with this approach.

Trait theories seem better at describing people than at understanding them. It is easy to say, for example, that Marilyn is nasty because she has a strong hostility trait; but other factors, such as the way people treat her, could also be responsible. In other words, trait theories say a lot about how people behave, but they don’t always explain why (Funder, 2012). Nor do trait theories say much about how traits are related to the thoughts and feelings that precede, accompany, and follow behavior. Do introverts and

extraverts decide to act as they do? Can they behave otherwise? And how do they feel about their actions and experiences? Some personality psychologists are linking their research with that of cognitive psychologists in an effort to better understand how thoughts and emotions influence, and are influenced by, personality traits (Jackson et al., 2012; Shoda & LeeTiernan, 2002). And as noted earlier, other psychologists are studying the roles played by genes, brain structures, and neurotransmitters in the individual differences we see among people's personality traits (e.g., Carver et al., 2011; Loehlin & Martin, 2011).

The trait approach has also been criticized for offering a short list of traits that provides, at best, a fixed and rather shallow description of personality that fails to capture how traits combine to form a complex and dynamic individual (Boag, 2011; Funder, 2012). There are questions, too, about whether there really are exactly five core dimensions of personality. Some evidence suggests, for example, that there might be a sixth dimension known as *honesty and humility* (Lee, Ogunfowora, & Ashton, 2005). Whatever the number turns out to be, some personality researchers doubt that these dimensions are exactly the same in all cultures (Gurven et al., 2013). Finally, even if some version of the five-factor personality model proves to be correct and universal, its factors are not all-powerful. Situations, too, affect behavior. For instance, eating sweet-tasting food can (at least temporarily) lead people to describe themselves as more agreeable and helpful to others (Meier et al., 2011). And people high in extraversion are not always sociable. Whether they behave sociably depends, in part, on where they are and who else is present.

In fairness, early trait theorists such as Allport acknowledged the importance of situations in influencing behavior, but it is only recently that consideration of interactions between people and situations has become an important part of trait-based approaches to personality. This change is largely the result of research conducted by psychologists who have taken a social-cognitive approach to personality, which we describe next.

THE SOCIAL-COGNITIVE APPROACH

Do we learn our personalities?

To social-cognitive researchers, psychodynamic theories place too much emphasis on unconscious forces in personality, and trait theories presume more consistency in people's behavior than there really is. In contrast, researchers who take a **social-cognitive approach** see personality as the full set of behaviors that people have acquired through *learning* and that they then display in particular situations (Cervone & Pervin, 2013). Some aspects of this approach reflect the view of traditional behaviorists, namely that all behavior is learned through classical and operant conditioning (see the chapter on learning). However, the social-cognitive approach expands that view by emphasizing (1) the role played by *learned patterns of thinking* in guiding behavior; and (2) the fact that personality is learned in social situations as people observe and interact with other people (Bandura & Walters, 1963; Cervone & Pervin, 2013). The social-cognitive approach is sometimes called the *social-learning approach* because it defines personality as the sum of the behaviors and cognitive habits that develop as people learn through experience in the social world. Social-cognitive theorists are interested in how our thinking affects our behavior as well as how our behavior and its consequences affect our thinking and our future actions (Mischel & Shoda, 2008; Shoda & Mischel, 2006).

social-cognitive approach The view that personality reflects learned patterns of thinking and behavior.

self-efficacy According to Bandura, the learned expectation of success in given situations.

Prominent Social-Cognitive Theories

The most prominent social-cognitive theories were developed by Julian Rotter, Albert Bandura, and Walter Mischel.

Rotter's Expectancy Theory

Julian Rotter (1982) argued that learning creates cognitions known as *expectancies* and that these expectancies guide behavior. According to Rotter, a person's decision to engage in a behavior is determined by (1) what the person expects to happen following the behavior; and (2) the value the person places on the outcome. For example, people spend a lot of money on new clothes for job interviews because past learning leads them to expect that doing so will help get them the job, and they place a high value on having the job. To Rotter, then, behavior is shaped by the positive or negative consequences it brings and by the expectancy that a particular behavior will be rewarded or punished (Mischel, Shoda, & Smith, 2004).

Personality researchers influenced by Rotter have suggested that in addition to learning expectancies about particular behaviors in particular situations, we also learn more general expectancies, especially about how life's good and bad outcomes are controlled (e.g., Phares, 1976). Some people (called *internals*) come to expect that most events are controlled by their own efforts. These people assume, for example, that what they achieve and the rewards they receive are determined by what they themselves do. Others (*externals*) tend to expect events to be controlled by external forces over which they have no control. So when externals succeed, they tend to believe that their success was based on chance or other forces outside themselves.

Research on differences in generalized expectancies does show that they are correlated with differences in behavior. For example, when threatened by a hurricane or other natural disaster, internals—in accordance with their belief that they can control what happens to them—are more likely than externals to buy bottled water and make other preparations (Sattler, Kaiser, & Hittner, 2000). Internals tend to work harder than externals at staying physically healthy and as a result may be healthier (Stürmer, Hasselbach, & Amelang, 2006). For instance, children with an internal control orientation are less likely than externals to become obese in later life (Gale, Batty, & Deary, 2008). Internals are less likely to drink alcohol or, if they do drink, are less likely to drive while intoxicated (Cavaia & Desordi, 2000). They are also more careful with money and better than externals at bargaining or negotiating (Lim, Teo, & Loo, 2003; Shalvi, Simone, & Ritov, 2010). As college students, internals tend to be better informed about their courses and about what they need to do to get a high grade than externals are. This may help to account for why internals tend to get better grades and graduate sooner (Dollinger, 2000; Hall, Smith, & Chia, 2008).

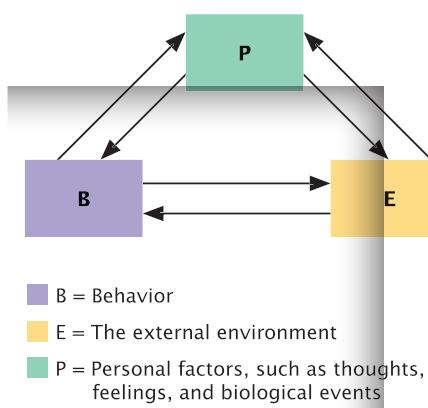


FIGURE 13.4
Reciprocal Determinism

Bandura's notion of reciprocal determinism suggests that thoughts, behavior, and the environment are constantly affecting each other. For example, a person's hostile thoughts might lead to hostile behavior, which generates even more hostile thoughts. At the same time, the hostile behavior offends others, thus creating a threatening environment that causes the person to think and act in even more negative ways. As increasingly negative thoughts alter the person's perceptions of the environment, that environment seems to be more threatening than ever (e.g., Bushman et al., 2005).

Source: From A. Bandura, "The Assessment and Predictive Generality of Self-Precepts of efficacy," Journal of Behavior Therapy and Experimental Psychiatry vol 13 (pp. 195–199).

Bandura and Reciprocal Determinism

In his social-cognitive theory, Albert Bandura (1999, 2011) sees personality as shaped by the ways that thoughts, behavior, and the environment interact and influence one another. He points out that whether people learn through direct experience with rewards and punishments or through watching what happens to others, their behavior creates changes in their environment. Observing these changes, in turn, affects how they think, which then affects their behavior, and so on in a constant web of mutual influence that Bandura calls *reciprocal determinism* (see Figure 13.4).

An especially important cognitive element in this system of mutual influence is perceived **self-efficacy**, the learned expectation of success. Bandura argued that what we do and what we try to do are heavily affected by our perceptions or beliefs about our chances of success at a task. People with a high perceived self-efficacy believe that they can successfully do things regardless of past failures or current obstacles. So the higher your perceived self-efficacy is in a particular task, the greater your actual accomplishments are likely to be (Joët, Usher, & Bressoux, 2011; Richardson, Abraham, & Bond, 2012). For example, research in twenty-six countries found that students' self-efficacy in mathematics was significantly related to their mathematical achievement (Williams & Williams, 2010). (Perhaps you recall the classic children's story *The Little Engine That Could*: Trying to get up a steep hill, the scared little engine starts by saying "I think I can, I think I can" and ends up saying "I know I can, I know I can." And it did.)

Self-efficacy interacts with expectancies about the outcome of behavior in general, and the result of this interplay helps shape a person's psychological well-being (Srimathi & Kiran, 2011). So if a person has low self-efficacy and believes that people have little effect on the world, apathy may result. But if a person with low self-efficacy believes that *other* people are enjoying the benefits of their efforts, the result may be self-criticism and depression.

Mischel's Cognitive/Affective Theory

Social-cognitive theorists argue that learned beliefs, feelings, and expectancies characterize each individual and make that individual different from other people. Walter Mischel calls these characteristics *cognitive person variables*. He argues that they outline the dimensions along which individuals differ (Mischel, 2009; Mischel & Shoda, 2008).

According to Mischel, these are the most important cognitive person variables:

1. *Encodings*: the person's beliefs about the environment and other people
2. *Expectancies*: including self-efficacy and what results the person expects will follow from various behaviors
3. *Affects*: feelings and emotions
4. *Goals and values*: the things a person believes in and wants to achieve
5. *Competencies and self-regulatory plans*: the things the person can do and the ability to thoughtfully plan behaviors (Engler, 2014)

To predict how a person might behave in a particular situation, says Mischel, we need to know about these cognitive person variables and about the features of that situation. In short, the person and the situation interact to produce behavior. Mischel's ideas have been called an "if-then" theory because he proposes that *if* people encounter a particular situation, *then* they will engage in the characteristic behaviors (called *behavioral signatures*) that they typically show in this situation (Smith et al., 2009).

Mischel was once highly critical of the trait approach to personality, but later said that his own theory is generally consistent with it. In fact, the concept of behavioral signatures resembles the concept of traits. However, Mischel still argues that trait theorists underestimate the power of situations to alter behavior and do not pay enough attention to the cognitive and emotional processes that underlie people's overt actions. Despite their remaining differences, most advocates of the trait and social-cognitive approaches have come to focus on the similarities between their views (Cervone, 2005; Funder, 2008). This search for similarities has helped clarify the relationship between personal and situational variables and how they affect behavior under various conditions. Many of the conclusions that have emerged are consistent with Bandura's concept of reciprocal determinism:

1. Personal dispositions (which include traits and cognitive person variables) influence behavior only in relevant situations. The trait of anxiousness, for example, may predict anxiety, but mainly in situations in which an anxious person feels threatened.
2. Personal dispositions can lead to behaviors that alter situations that in turn promote other behaviors. For example, a hostile child can trigger aggression in others and thus start a fight.
3. People choose to be in situations that are in accord with their personal dispositions. Introverts, for instance, are likely to choose quiet environments, whereas extraverts tend to seek out livelier, more social circumstances (Beck & Clark, 2009).
4. Personal dispositions are more important in some situations than in others. Where many different behaviors would be appropriate—at a picnic, for example—what people do can usually be predicted from their dispositions (extraverts will probably play games and socialize while introverts will probably watch from the sidelines).

The Impact of Situations

Like the rest of us, Dwayne "The Rock" Johnson behaves differently in different situations, including when acting in his movies or wrestling, and when not "on stage." Mischel's theory of personality emphasizes that the interactions between particular people and specific situations are vitally important in determining behavior.

Universal Pictures/Photofest; Axel Schmidt/AFP/DDP/Getty Images



However, in situations such as a funeral, where fewer options are socially acceptable, personal dispositions will not differentiate one person from another; everyone is likely to be quiet and somber.

Today, social-cognitive theorists are attempting to discover how cognitive person variables develop, how they relate to stress and health, and how they interact with situational variables to affect behavior.

Evaluating the Social-Cognitive Approach

The social-cognitive approach to personality is valuable because it blends concepts from behavioral learning theory with those of cognitive psychology and applies them to socially important topics such as aggression, the effects of mass media on children, and the development of techniques that enhance personal control over behavior. Social-cognitive principles have also been translated into cognitive-behavioral treatment procedures (Ryckman, 2013; see the chapter on treatment of psychological disorders).

The social-cognitive approach has not escaped criticism, however. Psychodynamic theorists point out that social-cognitive theories leave no role for unconscious thoughts and feelings in determining behaviors (e.g., Westen et al., 2008). Some trait theory advocates complain that social-cognitive theorists focus more on explaining why traits are unimportant than on why situations are important and argue that they have failed to identify what it is about specific situations that brings out certain behaviors (Sherman, Nave, & Funder, 2012). The social-cognitive approach has also been faulted for offering only a set of limited theories that share certain common assumptions about the nature of personality, rather than presenting a general theory of personality (Feist et al., 2013). Finally, some critics feel that the social-cognitive approach cannot capture the complexities, richness, and uniqueness that are inherent in human personality (Carver & Scheier, 2012). For these critics, a far more attractive alternative is offered by the humanistic approach to personality.

humanistic psychology approach

The view that personality develops in accordance with each person's unique perceptions of the world.

self-actualization The reaching of one's fullest potential; the complete realization of a person's talents, faculties, and abilities.

THE HUMANISTIC PSYCHOLOGY APPROACH

Is everyone basically good?

The **humanistic psychology approach** to personality focuses on mental capabilities that set humans apart: self-awareness, creativity, planning, decision making, and responsibility. Those who adopt the humanistic approach see human behavior as motivated mainly by an innate drive toward growth that prompts each of us to fulfill a unique potential and thus achieve an ideal state known as **self-actualization** (Goldstein, 1939). Like the planted

What Is Reality?

Each of these people has a different perception of what happened during the play that started this argument—and each is sure he is right! Disagreement about the “same” event illustrates *phenomenology*, each person’s unique perceptions of the world. The humanistic psychology approach holds that these perceptions shape personality and guide behavior. As described in the sensation and perception chapter, our perceptions are often influenced by top-down processing. In this case, expectations and motivation stemming from differing loyalties are likely to influence reality—and reactions—for each team’s players, coaches, and fans.

AP Images/Paul Spinelli



seed whose natural potential is to become a flower, people are seen as naturally inclined toward goodness, creativity, love, and joy. Humanistic psychologists argue that to explain people’s actions, it is more important to understand their view of the world than their instincts, traits, or learning experiences. To humanists, every individual’s worldview is a bit different, and it is this unique *phenomenology* (pronounced “feh-nah-men-AHL-oh-gee”), or way of perceiving and interpreting the world, that shapes personality and guides behavior (Schultz & Schultz, 2013). Because of its emphasis on the importance of looking at people’s perceptions, this approach to personality is also sometimes called the *phenomenological approach*.

Prominent Humanistic Theories

The best-known humanistic theories of personality are those of Carl Rogers and Abraham Maslow.

Rogers’s Self Theory

In his extensive writings, Carl Rogers (1961, 1970, 1980) emphasized the **actualizing tendency**, which he described as an innate inclination toward growth and fulfillment that motivates all human behavior (Raskin & Rogers, 2001). To Rogers, personality is the expression of that actualizing tendency as it unfolds in each person’s uniquely perceived reality (Schultz & Schultz, 2013).

The centerpiece of Rogers’s theory is the *self*, the part of experience that a person identifies as “I” or “me.” According to Rogers, those who accurately experience the self—with all its preferences, abilities, fantasies, shortcomings, and desires—are on the road to self-actualization. When experiences of the self become distorted, however, progress toward self-actualization is likely to be slowed or stopped.

Rogers saw personality development beginning early, as children learn to need others’ approval, or *positive regard*. Evaluations by parents, teachers, and others soon begin to affect children’s self-evaluations. When evaluations by others are in agreement with a child’s self-evaluations, the child reacts in a way that matches, or is *congruent* with, self-experience. The child not only feels others’ positive regard but also evaluates the self as “good” for having earned approval. This positive self-experience becomes part of a **self-concept**, the way one thinks of oneself. Unfortunately, things may not always go so smoothly. If

actualizing tendency An innate inclination toward growth and fulfillment that motivates all human behavior.

self-concept The way one thinks of oneself.



"Just remember, son, it doesn't matter whether you win or lose—unless you want Daddy's love."

Parents aren't usually this obvious about creating conditions of worth, but according to Rogers, the message gets through in many more subtle ways.

Pat Byrnes The New Yorker Collection/Cartoon Bank.com



The Joys of a Growth Orientation

According to Maslow's theory of personality, the key to personal growth and fulfillment lies in focusing on what we have, not on what we lack or have lost. Liz Heywood, a successful horse trainer, author, activist, and speaker, has never let the loss of her left leg slow her down.

Photo by Scott Huffman

conditions of worth According to Rogers, circumstances in which an individual experiences positive regard from others only when displaying certain behaviors or attitudes.

a pleasurable self-experience is evaluated negatively by others, the child must either do without positive regard or reevaluate the experience. So a little boy who is teased by his father for playing with dolls might have a distorted self-experience—deciding, perhaps, that “I don’t like dolls” or that “Feeling good is bad.”

In other words, Rogers suggested that personality is shaped partly by the actualizing tendency and partly by others’ evaluations. In this way, people come to like what they are “supposed” to like and behave as they are “supposed” to behave. This socialization process helps people get along in society but may require that they suppress their self-actualizing tendencies and distort their experiences. Rogers argued that psychological discomfort, anxiety, or mental disorder can result when the feelings people experience or express are *incongruent*, or at odds, with their true feelings.

Incongruence is likely, Rogers said, when parents and teachers lead children to believe that their personal worth depends on displaying the “right” attitudes, behaviors, and values. These **conditions of worth** are created whenever *people* are evaluated instead of their behavior. For example, parents who find their child drawing on the wall are not likely to say, “I love you, but I don’t approve of this behavior.”

They are more likely to shout, “Bad boy!” or “Bad girl!” This reaction suggests that the child is lovable and worthwhile only when well behaved. As a result, the child’s self-experience is not, “I like drawing on the wall but Mom and Dad don’t approve,” but instead, “Drawing on the wall is bad and I am bad if I like it, so I don’t like it.” The child may eventually show overly neat and tidy behaviors that do not reflect the real self but rather are part of an ideal self that was dictated by the parents.

As with Freud’s concept of superego, conditions of worth are first set up by external pressure but eventually become part of the person’s belief system. To Rogers, then, rewards and punishments are important in personality development not just because they shape behavior but also because they so easily create distorted self-perceptions and incongruence (Roth et al., 2009).

Maslow’s Growth Theory

Like Rogers, Abraham Maslow (1954, 1971) viewed personality as expressing a basic human tendency toward growth and self-actualization. In fact, Maslow saw self-actualization as not just a human capacity, but as the highest on a hierarchy of needs, as described in the chapter on motivation and emotion. Yet, said Maslow, people are often distracted from seeking self-actualization because they focus on lower-level needs.

Maslow argued that most people seem controlled by a *deficiency orientation*, a preoccupation with perceived needs for material things. Ultimately, he said, deficiency-oriented people see life as meaningless, disappointing, and boring, so they may start to behave in problematic ways. For example, in trying to satisfy a need for love, people may focus on what love gives them (security), not on what they can give to someone else. This deficiency orientation may lead a person to be jealous and focus on what is missing in relationships; as a result, the person may never truly experience love or security.

In contrast, those with a *growth orientation* experience satisfaction from what they have, what they are, and what they can do, instead of focusing on what’s missing. This orientation opens the door to what Maslow called *peak experiences*, in which people feel joy, and even ecstasy, in the mere fact of being alive, being human, and knowing that they are utilizing their fullest potential.

Evaluating the Humanistic Approach

The humanistic approach to personality is consistent with the way many people view themselves. It focuses on immediate experience and emphasizes each person’s uniqueness. The best-known application of the humanistic approach is the client-centered

therapy of Carl Rogers, which is discussed in the chapter on treatment of psychological disorders. The humanistic approach has also inspired other therapies as well as short-term personal-growth experiences such as sensitivity training and encounter groups that are designed to help people become more aware of themselves and how they relate to others (e.g., Cain & Seeman, 2002). Rogers' perspective has also been incorporated into interventions designed to help people live healthier lives, including by giving up smoking and exercising more (Suarez & Mullins, 2008). Further, the humanistic approach fits well with the rapidly growing field of *positive psychology*, which, as described in the chapter on motivation and emotion, focuses on well-being and other positive aspects of human thought and feelings (Compton & Hoffman, 2012; Snyder, Lopez, & Pedrotti, 2010).

Yet to some, the humanistic approach is naive, romantic, and unrealistic. Are all people as inherently good and "growth oriented" as this approach suggests? Critics wonder about that assumption, and they also fault humanists for paying too little attention to the role of inherited characteristics, learning, situational influences, and unconscious motivation in shaping personality. Further, the idea that personality development is directed only by an innate growth potential is seen by many as an oversimplification. So, too, is the humanistic assumption that all human problems stem from blocked self-actualization. Personality researchers also see many humanistic concepts as too vague to be tested empirically. Accordingly, the humanistic approach has not been popular among those who conduct empirical research to learn about personality (Cervone & Pervin, 2010). That may begin to change, though, as an explosion of research in positive psychology leads to new humanistically oriented theories that better lend themselves to empirical evaluation (e.g., Burton et al., 2006; Cohn et al., 2009; Waugh, Fredrickson, & Taylor, 2008).

Finally, humanists' tendency to define ideal personality development in terms of personal growth, independence, and self-actualization has been criticized for emphasizing culture-specific concepts about mental health that may not apply outside Western individualist cultures (Heine & Buchtel, 2009). As discussed in the next section, the foundations of humanistic self theories may be in direct conflict with the values of non-Western collectivist cultures.

"In Review: Major Approaches to Personality" summarizes key features of the humanistic approach and those of the other approaches we described. Which approach is most accurate? There is no simple answer to that question, partly because each approach emphasizes different aspects of personality. Instead, a full understanding of the origins and development of personality may come only by recognizing the roles of all the factors that various approaches have shown to be important. Some psychologists are working on theoretical models that take this promising integrative approach (Mayer, 2005; McAdams & Pals, 2006).

MAJOR APPROACHES TO PERSONALITY

IN REVIEW

Approach	Basic Assumptions about Behavior	Typical Research Method
Psychodynamic	Determined by largely unconscious intrapsychic conflicts	Case studies
Trait	Determined by traits or needs	Analysis of tests for basic personality dimensions

(continued)

IN REVIEW

MAJOR APPROACHES TO PERSONALITY (CONT.)

Approach	Basic Assumptions about Behavior	Typical Research Method
Social-cognitive	Determined by learning, cognitive factors, and specific situations	Analysis of interactions between people and situations
Humanistic	Determined by innate growth tendency and individual perception of reality	Studies of relationships between perceptions and behavior

In Review Questions

1. Tests that measure the five-factor model's dimensions of personality are based on the _____ approach to personality.
2. The role of learning is most prominent in the _____ approach to personality.
3. Object relations and attachment theories are modern variants on _____ personality theories.

LINKAGES Does culture determine personality? (a link to Human Development)

LINKAGES

PERSONALITY, CULTURE AND HUMAN DEVELOPMENT

Western cultures tend to encourage people to "stand up for yourself" or "blow your own horn" to "get what you have coming to you." In middle-class North America, the values of achievement and personal distinction are taught to children, particularly boys, early in life (Matsumoto & Juang, 2011). North American children are encouraged to feel uniquely special and to have self-esteem, partly because of a culturally based association of these characteristics with happiness, popularity, and academic achievement. Whether self-esteem is the cause or the result of these good outcomes (Baumeister, Masicampo, & Twenge, 2013), children who display these values tend to receive praise for doing so.

As a result of this cultural training, many people in North America and Europe develop personalities based on a sense of high self-worth. In one study (Markus & Kitayama, 1997), 70 percent of a sample of U.S. students believed that they were superior to their peers. In addition, 60 percent believed that they were in the top 10 percent on a wide variety of personal attributes! This tendency toward self-enhancement is evident as early as age four.

Many Western personality theorists see a sense of independence, uniqueness, and self-esteem as fundamental to mental health. As noted in the chapter on human development, for example, Erik Erikson included the emergence of personal identity and self-esteem as part of normal psychosocial development. Middle-class North Americans who fail to value and strive for independence, self-promotion, and unique personal achievement may be seen as having a personality disorder, some form of depression, or other psychological problems.

Are these ideas based on universal truths about personality development or do they reflect the values of the cultures that generated them? It's certainly clear that people in many non-Western cultures develop personal orientations that are quite different from those of North Americans and Europeans (Kitayama, 2013; Matsumoto & Juang, 2011). In China and Japan, for example, an independent, unique self is not emphasized nearly as much as it is in North America (Kitayama et al., 2009). Children there are encouraged to develop and maintain pleasant, respectful relations with others but not to stand out from the crowd, because doing so might make others seem inferior by comparison. So, whereas children in the United States

(continued)

The goal of esteem building is clear these days in many children's activities at school and in some team sports, too, which are designed either to eliminate competition or (as in this case) assure that everyone feels like winners. The same goal is reflected in daycare centers, summer camps, and other children's programs with names such as Starkids, Little Wonders, Superkids, and Precious Jewels.

Leo Cullum The New Yorker Collection/The Cartoon Bank

hear that "the squeaky wheel gets the grease" (meaning that you don't get what you want unless you ask for it), Japanese children are warned that "the nail that stands up gets pounded down" (meaning that it is not a good idea to draw attention to yourself). From a very young age, they are taught to be modest, to play down the value of personal contributions, and to appreciate the joy and value of group work (Kitayama & Uchida, 2003).



In contrast to the *independent* self system common in individualist cultures such as Great Britain, Switzerland, and the United States, cultures with a more collectivist orientation (such as Brazil, China, Japan, and Nigeria) promote an *interdependent* self system through which people see themselves as a fraction of the social whole. Each person has little or no meaningful definition without reference to the group. These differences in self systems may produce differences in what gives people a sense of well-being and satisfaction (Han et al., 2013). For example, in the United States, a sense of well-being is usually associated with having *positive* attributes, such as intelligence, creativity, competitiveness, persistence, and so on. In Japan and other Asian countries, feelings of well-being are more likely to be associated with having no *negative* attributes (Ruby et al., 2012). Studies of thousands of people all over the world indicate that in collectivist cultures, life satisfaction is associated with having social approval and harmonious relations with others. In individualist cultures, life satisfaction is associated with having high self-esteem and good feelings about one's own life (Uchida et al., 2001).

Culture and Personality

TRY THIS In individualist cultures, most children learn early that personal distinction is valued by parents, teachers, and peers. In collectivist cultures, having a strong sense of self-worth may be seen as less important. In other words, the features of "normal" personality development vary from culture to culture. Make a list of the core values you've learned. Which of them are typical of individualist cultures, which are typical of collectivist cultures, and which reflect a combination of both?

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Because cultural factors shape ideas about how the ideal personality develops, it's important to evaluate approaches to personality in terms of how well they apply to cultures other than the one in which they were developed (Markus & Kitayama, 2010). Their applicability to males and females must be considered as well. Even within North American cultures, for example, there are gender differences in the development of self-esteem. Females tend to show an interdependent self system, achieving their sense of self and self-esteem from attachments to others. By contrast, males' self-esteem tends to develop in relation to personal achievement, in a manner more in keeping with an independent self system (Cross & Madson, 1997). Cross-gender and cross-cultural differences in the nature and determinants of a sense of self highlight the widespread effects of gender and culture on the development of many aspects of human personality (Heine & Ruby, 2010; Matsumoto & Juang, 2011).

FOCUS ON RESEARCH METHODS

PERSONALITY DEVELOPMENT OVER TIME

Psychologists have long wondered how people's personalities differ, but they also want to know how those differences begin. Some search for answers in infants' differing temperaments. As noted in the chapter on human development, temperament is reflected in the unlearned, generalized patterns of emotional expression and other behavior that people show from birth (Buss, 1997).

What was the researchers' question?

Can young children's temperaments predict their personality characteristics and behaviors as adults?

How did the researchers answer the question?

To try to answer this question, Avshalom Caspi and his colleagues have conducted a longitudinal study that assessed the same people at several different times in their lives (Caspi et al., 1995; Caspi, Harrington et al., 2003; Slutske et al., 2012). The research sample included all the children born in Dunedin, New Zealand, between April 1972 and March 1973—a total of about 1,000 people. When these children were three years old, research assistants observed them in a standard situation and rated them on a number of dimensions, including the degree to which they showed explosive or uncontrolled behavior, interacted easily with others, or acted withdrawn and unresponsive. These observations were used to place each child into one of five temperament categories: *undercontrolled* (irritable, impatient, emotional), *inhibited* (shy, fearful, easily distracted), *confident* (eager to perform, responsive to questions), *reserved* (withdrawn, uncomfortable), and *well adjusted* (friendly, well controlled). The children were observed and categorized again when they were three, five, seven, and nine years old. If it occurs to you that seeing a child at one point in life might bias an observer's ratings of that child later on, you are right. To ensure that ratings would not be influenced by this kind of observer bias, the researchers arranged for different people to make the ratings at each point in time. These ratings indicated that the children's temperaments stayed about the same over the years from age three to age nine.

When the research participants were between the ages eighteen and thirty-two, they were interviewed. Some interviews explored involvement in risky and unhealthy behaviors, such as excessive drinking, violent criminal activities, unprotected sex, unsafe driving habits, or pathological gambling. At one point, the participants took a standard personality test and were rated by friends on the Big Five personality dimensions. To avoid bias, interviewers had no information about the participants' childhood temperaments. The primary question was whether temperament assessed in childhood predicted personality traits and behavior problems in adulthood.

What did the researchers find?

Adult personality and behavior characteristics were in fact different across the five original childhood temperament groups. For example, the average test scores of twenty-six-year-olds who had been classified as "undercontrolled" in childhood showed that they were more alienated, uninhibited, and stressed, and reported many more negative emotions than the other temperament groups. Participants who had been "inhibited" at age three scored much lower as adults on social potency and positive emotionality than other participants. Further, people who had been classified as "confident" or "well adjusted" as children tended to be better adjusted and more extraverted at age twenty-six than people who had been classified as "inhibited" or "reserved." These findings held true for males and females alike.

There were also correlations between childhood temperament and risky behavior in young adulthood. For example, "undercontrolled" children were about twice as likely as

(continued)

others to develop personalities associated with violence, excessive drinking, and other health-endangering behaviors (Caspi, Harrington et al., 2003). These individuals were also more likely to have serious gambling problem at both ages twenty-one and thirty-two (Slutske et al., 2012).

What do the results mean?

Such research results suggest that we can make relatively accurate predictions about people's personalities and behaviors as adults if we know about their temperaments as children (e.g., Glenn et al., 2007). But as critical thinkers, we must be careful not to overstate the strength of these results. Although the correlations between temperament and personality or problematic behaviors were statistically significant, they were also relatively small. Not all children classified as "undercontrolled" at age three turned out to be aggressive or violent at eighteen. So it is more accurate to say that personality may be influenced and shaped by temperament but is not completely determined by it (Clark & Watson, 2008; Roberts, Walton, & Viechtbauer, 2006).

What do we still need to know?

Valuable as it is, this research leaves a number of unanswered questions about the relationship between temperament and personality (Shanahan et al., 2012). For example, why is there a connection between temperament as a child and personality as an adult? The link is probably a complex one involving both nature and nurture (Hampson, 2008). Caspi and his colleagues (1989) offered one explanation that draws heavily on social-cognitive theories, especially Bandura's notion of reciprocal determinism. They proposed that long-term consistencies in behavior result from the mutual influence that temperament and environmental events have on one another (Friedman et al., 2012). For example, people may put themselves in situations that reinforce their temperament. So undercontrolled people might choose to spend time with people who accept (and even encourage) rude or impolite behavior. When such behavior does bring negative reactions, the world seems that much more hostile, and the undercontrolled people become even more aggressive and negative. Caspi and his colleagues see the results of their studies as evidence that this process of mutual influence between personality and situations can continue over a lifetime (Caspi, Harrington et al., 2003).

ASSESSING PERSONALITY

How do psychologists measure personality?

We all want to know something about our own personality and other people's, too, so it is no wonder that various kinds of personality assessments are widely available in newspapers and magazines and on the Internet. For example, there is a website called Tweet-Psych that offers personality profiles of frequent Twitter users based on the content of their tweets. Information available on Facebook has also been used to assess various personality dimensions (Back et al., 2010), but psychologists usually assess and describe personality using information from four main sources (Funder, 2007): *life outcomes* (such as records of education, income, or marital status), *situational tests* (observations of behavior in situations designed to measure personality), *observer ratings* (judgments about a person made by friends or family; Oltmanns & Turkheimer, 2009), and *self-reports* (responses to interviews and personality test items). Data gathered through these methods assist in employee selection, in the diagnosis of psychological disorders, in making predictions about a convict's or mental patient's dangerousness, and in other situations involving risky decisions (Kramer, Bernstein, & Phares, 2014; Meyer et al., 2001).

Life outcomes, observer ratings, and situational tests make it possible to directly assess many aspects of personality and behavior, including how often, how effectively, and how consistently various actions occur (Funder, 2012). *Interviews* provide information



FIGURE 13.5
The Rorschach Inkblot Test

TRY THIS People taking the Rorschach test are shown ten patterns similar to this one and asked to tell what the blot looks like and why. Jot down what you see in this blot and why, and then compare your responses to those of some friends. Most methods of scoring this test focus on (1) what part of the blot the person responds to; (2) what details, colors, or other features determine each response; (3) the content of responses (such as seeing animals, maps, or body parts); and (4) the popularity or commonness of the responses.

Charlotte Miller

projective personality measures

Tests made up of relatively unstructured stimuli in which responses are seen as reflecting the individuals' unconscious needs, fantasies, conflicts, thought patterns, and other aspects of personality.

nonprojective personality measures Tests that list clear, specific questions, statements, or concepts to which people are asked to respond.

about personality from the person's own point of view. Some interviews are *open-ended*, meaning that questions are tailored to the intellectual level, emotional state, and special needs of the person being assessed. Others are *structured*, meaning that the interviewer asks a fixed set of questions about specific topics in a particular order. Structured interviews are routinely used in personality research because they are sure to cover matters of special interest to the researcher.

Personality tests offer a way to gather self-report information that is more standardized and economical than interviews. To be useful, however, a personality test must be reliable and valid. As described in the chapter on thought and language, *reliability* refers to how stable or consistent the results of a test are; *validity* reflects the degree to which test scores are interpreted appropriately and used properly in making inferences about people. The many personality tests available today are traditionally classified as either *projective* or *nonprojective*.

Projective Personality Measures

Projective personality measures contain items or tasks that are ambiguous, meaning that they can be perceived in many different ways. People taking projective tests might be asked to draw a house, a person, a family, or a tree; to fill in the missing parts of incomplete pictures or sentences; to say what they associate with particular words; or to report what they see in a drawing or picture. Projective techniques are sometimes used in personality research, but they are far more popular among psychodynamically oriented clinical psychologists, who use them to assess their clients' personality characteristics and psychological disorders (Schultz & Schultz, 2013). These psychologists believe that people's responses to projective tests are guided by unconscious needs, motives, fantasies, conflicts, or other hidden aspects of personality.

One widely used projective test, called the *Thematic Apperception Test* (TAT) is described in the chapter on motivation and emotion as a measure of need for achievement. Henry Murray and Christina Morgan developed this test to assess the needs they saw as the basis of personality. Another well-known projective test, the *Rorschach Inkblot Test*, uses a series of ten inkblots similar to the one in Figure 13.5. The respondent is asked to tell what the blot might be, and then to explain why.

Those who support projective testing claim that using ambiguous test items makes it hard for respondents to figure out what is being measured or what the "best" answers should be. They argue, therefore, that these tests can measure aggressive and sexual impulses and other personality features that people might want to conceal. Advocates of projective measures also point to specific cases in which projective tests have shown acceptable reliability and validity, such as in the assessment of achievement motivation with the TAT (Schultheiss, 2013).

Nonetheless, most researchers agree that projective personality measures, especially the Rorschach, are much less reliable and valid than the nonprojective personality measures described next (Garb et al., 2005; Wood et al., 2010). In fact, because of their generally poor ability to predict behavior, projective measures often add little information about people beyond what might be inferred from interviews or other sources (Hunsley, Lee, & Wood, 2003).

Nonprojective Personality Measures

Nonprojective personality measures, also known as *objective personality measures*, ask clear questions about a person's thoughts, feelings, or behavior (such as "Do you like to go to parties?"). The answers are used to draw conclusions about the individual's personality. These self-report tests are usually set up in a multiple-choice or true-false format

that allows them to be given to many people at once, much like the academic tests used in many classrooms. A different approach has been taken by personality researchers who assess personality characteristics on the basis of computerized analysis of people's writing style, including how formal it is and how often they use particular kinds of words and phrases (e.g., Yarkoni, 2010). As in the classroom, nonprojective personality measures can be scored by machine and then compared with the responses of other people. So before interpreting your score on a nonprojective personality measure of extraversion, for example, a psychologist would compare it to a *norm*, or the average score of thousands of others of your age and gender. You would be considered unusually extraverted only if you scored well above that norm.

Some nonprojective personality measures focus on one particular trait, such as optimism (Carver & Scheier, 2002). Others measure a small group of related traits, such as empathy and social responsibility (Penner & Orom, 2009). Still other nonprojective tests measure the strength of a wider variety of traits to reveal general psychological functioning. For example, the third edition of the *Neuroticism Extraversion Openness Personality Inventory*, or NEO-PI-3 (McCrae, Harwood & Kelly, 2011), is designed to measure the Big Five personality traits described earlier. Table 13.3 shows how the test's results are presented. The NEO-PI-3 is quite reliable (Costa & McCrae, 2008), and people's scores on its various scales have been successfully used to predict a number of criteria, including performance on specific jobs and overall career success (Conte & Gintoft, 2005; Zhao & Seibert, 2006), social status (Anderson et al., 2001), and the likelihood that a person will engage in criminal activities or risky sexual behaviors (Miller et al., 2004).

TABLE 13.3 SAMPLE SUMMARY OF RESULTS FROM THE NEO-PI-3

The NEO-PI-3 assesses the Big Five personality dimensions (McCrae & Costa, 2010). In this example of the results that a person might receive, the five factors scored are (from the top row to the bottom row) neuroticism, extraversion, openness, agreeableness, and conscientiousness. Because people with different NEO profiles tend to have different psychological problems, this test has been used to aid in the diagnosis of personality disorders (Trull & Sher, 1994).

Compared with the responses of other people, your responses suggest that you can be described as:

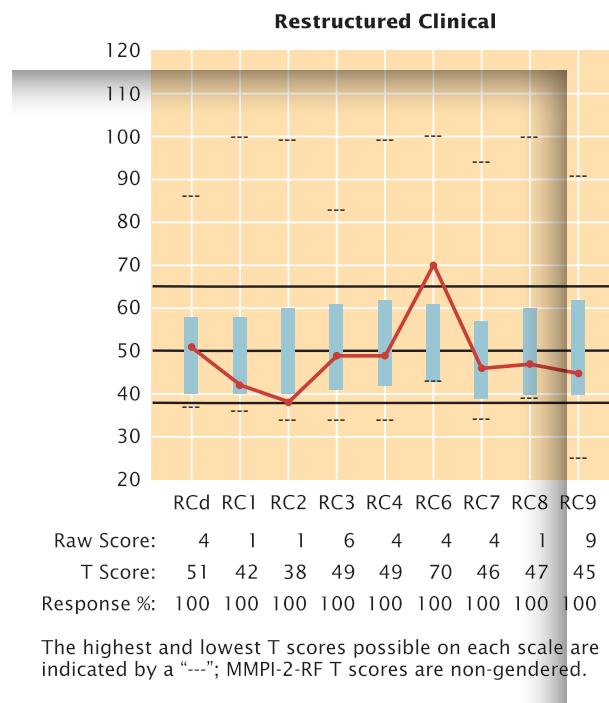
- | | | |
|--|--|---|
| <input type="checkbox"/> Sensitive, emotional, and prone to experience feelings that are upsetting. | <input checked="" type="checkbox"/> Generally calm and able to deal with stress but you sometimes experience feelings of guilt, anger, or sadness. | <input type="checkbox"/> Secure, hardy, and generally relaxed even under stressful conditions. |
| <input type="checkbox"/> Extraverted, outgoing, active, and high-spirited. You prefer to be around people most of the time. | <input type="checkbox"/> Moderate in activity and enthusiasm. You enjoy the company of others but you also value privacy. | <input checked="" type="checkbox"/> Introverted, reserved, and serious. You prefer to be alone or with a few close friends. |
| <input type="checkbox"/> Open to new experiences. You have broad interests and are very imaginative. | <input type="checkbox"/> Practical but willing to consider new ways of doing things. You seek a balance between the old and the new. | <input checked="" type="checkbox"/> Down-to-earth, practical, traditional, and pretty much set in your ways. |
| <input type="checkbox"/> Compassionate, good-natured, and eager to cooperate and avoid conflict. | <input checked="" type="checkbox"/> Generally warm, trusting, and agreeable, but you can sometimes be stubborn and competitive. | <input type="checkbox"/> Hardheaded, skeptical, proud, and competitive. You tend to express your anger directly. |
| <input checked="" type="checkbox"/> Conscientious and well organized. You have high standards and always strive to achieve your goals. | <input type="checkbox"/> Dependable and moderately well organized. You generally have clear goals but are able to set your work aside. | <input type="checkbox"/> Easygoing, not very well organized, and sometimes careless. You prefer not to make plans. |

FIGURE 13.6

The MMPI-2-RF: Clinical Scales and Sample Profiles

A score of 50 on the clinical scales of the MMPI-2-RF is average. Scores at or above 65 mean that the person's responses on that scale are more extreme than at least 95 percent of the normal population. The red line on this chart represents the MMPI-2-RF profile of a twenty-six-year-old married man. It is characteristic of a person who is about average in most ways, but who believes that other people are against him, are "out to get him," or are a threat to him. The clinical scales abbreviated in the figure are as follows:

- RCd: Demoralization—General unhappiness and dissatisfaction
- RC1: Somatic Complaints—Diffuse physical health complaints
- RC2: Low Positive Emotions—Lack of positive emotional responsiveness
- RC3: Cynicism—Beliefs that express distrust and a generally low opinion of others
- RC4: Antisocial Behavior—Rule-breaking and irresponsible behavior
- RC6: Ideas of Persecution—Beliefs that others pose a threat to oneself
- RC7: Dysfunctional Negative Emotions—Maladaptive anxiety, anger, irritability
- RC8: Aberrant Experiences—Unusual perceptions or thoughts
- RC9: Hypomanic Activation—Overactivation, aggression, impulsivity, and grandiosity



When the goal of personality assessment is to diagnose psychological disorders, the most commonly used nonprojective measure is the *Minnesota Multiphasic Personality Inventory*, better known as the *MMPI* (Butcher, 2006). The original 566-item true-false test, developed in the 1930s at the University of Minnesota by Starke Hathaway and J. C. McKinley, has been revised and updated as the MMPI-2-RF (restructured form; Ben-Porath & Tellegen, 2008).

The MMPI is organized into groups of items called *clinical scales*. Certain patterns of responses to the items on these scales have been associated with people who display particular psychological disorders or personality characteristics. It also contains several *validity scales*. Responses to these scales detect whether respondents are distorting their answers, misunderstanding the items, or being uncooperative. For example, someone who responds “true” to items such as “I never get angry” may not be giving honest answers to the test as a whole.

To interpret the meaning of MMPI results, a person's scores on the clinical scales are plotted as a *profile* (see Figure 13.6). This profile is then compared with the profiles of people who are known to have certain personality characteristics or problems. It is presumed that people taking the MMPI share characteristics with people whose profiles are most similar to their own. So although a high score on a particular clinical scale, such as depression, might suggest a problem in that area, interpreting the MMPI usually focuses on the overall pattern in the clinical scale scores—particularly on the combination of two or three scales on which a person's scores are unusually high.

The MMPI clinical scales appear to be reliable and valid (Forbey & Ben-Porath, 2008), but even the latest editions of the test are far from perfect measurement tools (Rouse, 2007; Selbom & Bagby, 2010). A particular pattern of MMPI scale scores does not guarantee the presence of a particular disorder (Leising & Zimmerman, 2011). The validity of MMPI interpretations may be particularly suspect when—because of cultural factors—the perceptions, values, and experiences of the test taker differ significantly from those of the test developers and the people with whom the respondent's results are compared. So although

LINKAGES Can personality tests be used to diagnose mental disorders? (a link to Psychological Disorders)

an MMPI profile might look like that of someone with a mental disorder, the profile might actually reflect the culture-specific way the person interpreted the test items, not a psychological problem (Butcher, 2004; Groth-Marnat, 1997). Even though the MMPI-2-RF uses comparison norms that represent a more culturally diverse population than did those of the original MMPI, psychologists must still be cautious when interpreting the profiles of people who identify with minority subcultures (Butcher, 2004; Cheung, van de Vijver, & Leong, 2011; Church, 2010).

“In Review: Personality Measures” summarizes the characteristics of projective and nonprojective personality tests and some of their advantages and disadvantages.

PERSONALITY MEASURES				IN REVIEW
Type of Test	Characteristics	Advantages	Disadvantages	
Projective	Ambiguous stimuli create maximum freedom of response; scoring is relatively subjective	“Correct” answers not obvious; designed to tap unconscious impulses; flexible use	Reliability and validity lower than those of nonprojective tests	
Nonprojective	Written format; quantitatively scored	Efficiency, standardization	Subject to deliberate distortion	

In Review Questions

1. Projective personality measures are based on the _____ approach to personality.
2. The NEO-PI-3 and the MMPI-2-RF are examples of _____ tests.
3. Most personality researchers use _____ tests in their work.

Personality Tests and Employee Selection

How good are nonprojective personality measures at selecting people for jobs? Most industrial and organizational psychologists see them as valuable tools for selecting good employees. Tests such as the MMPI (and even some projective measures) are sometimes used to help guide hiring decisions (Matyas, 2004), but large organizations usually choose nonprojective measures that are designed to measure the Big Five personality dimensions or related characteristics (Barrick & Mount, 2012; Kuncel, Ones, & Sackett, 2010). Several researchers have found significant relationships between scores on the Big Five dimensions and measures of job performance and effective leadership (Detrick & Chibnall, 2013; Motowidlo, Brownlee, & Schmit, 2008; Sitser, van der Linden & Born, 2013). A more general review of studies involving thousands of people has shown that nonprojective personality measures are of value in helping businesses reduce theft, absenteeism, and other disruptive employee behaviors (e.g., Iliescu, Ilie, & Ispas, 2011; Kuncel et al., 2010).

Still, personality tests are not perfect predictors of workplace behavior (Sackett & Schmitt, 2012). Many of them measure traits that may be too general to predict specific aspects of job performance (Berry, Sackett, & Wiemann, 2007; Furnham, 2001). Also, some researchers have raised questions about the validity and usefulness of the tests used (Van Iddekinge et al., 2012), and job applicants do sometimes engage in faking to increase the chances they will be hired (Galić, & Jerneić, 2013; Griffin & Wilson, 2012). By contrast, some features of the work situation may better predict employee behavior than do personality measures (Gupta, Ganster, & Kepes, 2013). Further, some employees see personality measures as an invasion of privacy. They worry that test results in their personnel files might be misinterpreted and hurt their chances for promotion or jobs elsewhere. Lawsuits have resulted in a ban on using personality tests to select U.S. federal employees. Concerns about privacy and other issues surrounding personality testing led the American Psychological Association and related organizations to publish joint ethical standards on the development, distribution, and use of all psychological tests (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999; American Psychological Association, 2002b). The goal is not only to improve the reliability and validity of tests but also to ensure that their results are properly used and do not infringe on individuals' rights (Turner et al., 2001).

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of personality, culture, and human development illustrates just one way that the topic of this chapter, personality, is linked to the subfield of developmental psychology, which is described in the chapter on human development. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 13 Personality



LINKAGES

How do you know if a personality test (or any other kind of test) is any good?



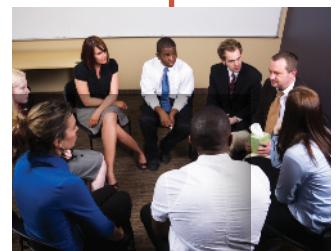
CHAPTER 8 Intelligence

Does culture determine personality?



CHAPTER 11 Human Development

Can therapy change personality?



CHAPTER 15 Treatment of Psychological Disorders

SUMMARY

Personality refers to the unique pattern of psychological and behavioral characteristics by which each person can be compared and contrasted with other people. The four main theoretical approaches to personality are the psychodynamic, trait, social-cognitive, and humanistic approaches.

The Psychodynamic Approach

How did paralyzed patients lead Freud to psychoanalysis?

The **psychodynamic approach**, pioneered by Freud, assumes that personality arises out of unconscious psychological processes that interact to determine our thoughts, feelings, and behavior. According to Freud's **psychoanalytic theory**, personality has three components—the *id*, which operates according to the **pleasure principle**; the *ego*, which operates according to the **reality principle**; and the *superego*, which internalizes society's rules and values. The ego uses **defense mechanisms** to prevent unconscious conflicts among these components from becoming conscious and causing anxiety or guilt.

Freud proposed that the focus of conflict changes as the child passes through stages of **psychosexual development**. These include the **oral stage**, the **anal stage**, the **phallic stage** (during which the **Oedipal complex** or the **Electra complex** occurs), the **latency period**, and the **genital stage**.

Many of Freud's followers developed new theories that differed from his. Among these theorists were Jung, Adler, and Horney. They tended to downplay the role of instincts and the unconscious, emphasizing instead the importance of conscious processes, ego functions, and social and cultural factors. Horney also challenged the male-oriented nature of Freud's original theory.

Current psychodynamic theories reflect the neo-Freudians' emphasis on family and social relationships. According to object relations and attachment theorists, personality development depends mainly on the nature of early interactions between individuals and their caregivers.

The psychodynamic approach is reflected in many forms of psychotherapy, but critics fault the approach for its lack of a scientific base and for its view of human behavior as driven by forces that are difficult or impossible to measure.

The Trait Approach

What personality traits are most basic?

The **trait approach** assumes that personality is made up of stable internal **personality traits** that appear at varying strengths in different people and guide their thoughts, feelings, and behavior. Allport believed that personality is created by a small set of central traits and a larger number of secondary traits in each individual. Allport studied unique patterns of traits, whereas later researchers such as Cattell used factor analysis to explore common traits or core dimensions of personality. Most recently, these factor analyses have identified five basic dimensions of

personality, collectively referred to as the **five-factor**, or **Big Five, personality model**. These dimensions—openness, conscientiousness, extraversion, agreeableness, and neuroticism—have been found in many different cultures and may arise partly from inherited differences in temperament and other biological factors that provide the raw materials from which each personality is molded by experience. These biological factors are the focus of trait theories proposed by Eysenck and by Gray.

The trait approach has been criticized for being better at describing personality than at explaining it, for failing to consider mechanisms that motivate behavior, and for underemphasizing the role of situational factors. Nevertheless, the trait approach—particularly the five-factor personality model—currently dominates the field.

The Social-Cognitive Approach

Do we learn our personalities?

The **social-cognitive approach** assumes that personality is a set of unique patterns of thinking and behavior that a person acquires through learning and then displays in particular situations. The social-cognitive approach has expanded on traditional behavioral approaches by emphasizing the role of cognitive factors, such as observational learning, in personality development.

Rotter's theory focuses on expectancies that guide behavior, and it generated interest in assessing general beliefs about whether rewards occur because of personal efforts (internal control) or chance (external control). Bandura believes that personality develops largely through cognitively mediated learning, including observational learning. He sees personality as reciprocally determined by interactions among cognition, environmental stimuli, and behavior. **Self-efficacy**—the belief in one's ability to accomplish a given task—is an important determinant of behavior. Mischel emphasizes the importance of situations and their interactions with cognitive person variables in determining behavior. According to Mischel, we must look at both cognitive person variables and situational variables in order to understand human consistencies and inconsistencies.

The social-cognitive approach has led to new forms of psychological treatment and many other applications. However, critics of this approach consider even its latest versions to be incapable of capturing all the unlearned factors that some psychologists see as important in personality.

The Humanistic Approach

Is everyone basically good?

The **humanistic psychology approach**, also called the **phenomenological approach**, is based on the assumption that personality is determined by the unique ways that each individual views the world. These perceptions form a personal version of reality and guide people's behavior as they strive to reach **self-actualization**, their fullest potential.

Rogers believed that personality development is driven by an innate **actualizing tendency**, but also that one's **self-concept** is shaped by social evaluations. He proposed that the **conditions of worth** that parents and others impose interfere with personal growth and can lead to psychological problems. Maslow saw self-actualization as the highest in a hierarchy of needs. Personality development is healthiest, he said, when people have a growth orientation rather than a deficiency orientation.

The humanistic approach has been used in certain forms of psychotherapy, in parent training, and in group experiences designed to enhance personal growth. This approach has considerable popularity, but it has been faulted for being too idealistic, for failing to explain personality development, for being vague and unscientific, and for underplaying cultural differences in "ideal" personalities.

Many people in the individualist cultures of North America and Europe are taught to believe in the importance of self-worth and personal distinction. This independent self system contrasts with the interdependent self system that is often fostered in collectivist cultures, in which the self is defined mainly in relation to family or other groups. Contrasting definitions of the self in different cultures and among males versus females tend to exert differing influences on the development of personality.

Research suggests that temperament in childhood may influence personality development into adulthood.

Assessing Personality

How do psychologists measure personality?

Personality is usually assessed through some combination of life outcomes, observer ratings, situational tests, and self-reports. To be useful, personality assessments must be both reliable and valid.

Based on psychodynamic theories, **projective personality measures** present ambiguous stimuli in an attempt to tap unconscious personality characteristics. Two popular projective tests are the TAT and the Rorschach. In general, projective personality measures are less reliable and valid than nonprojective personality measures.

Nonprojective personality measures, also known as objective measures, usually present clear, direct items; their scores can be compared with group norms. The NEO-PI-3 and the MMPI-2-RF are examples of nonprojective personality measures.

Nonprojective personality measures are often used to identify which people are best suited for certain occupations. Although such tests can be helpful in this regard, those who use them must be aware of the tests' limitations and take care not to violate the rights of test respondents.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. When psychologists talk about the unique pattern of enduring psychological and behavioral characteristics by which each person can be compared and contrasted with other people, they are referring to _____.
 - a. motivation
 - b. personality
 - c. reciprocal determinism
 - d. conditions of worth
2. As Jared is jostled by a passerby, he thinks, "I'd like to hit that guy!" Freud would say that this impulse comes from Jared's _____, which operates on the _____ principle.
 - a. id; pleasure
 - b. id; reality
 - c. ego; pleasure
 - d. ego; reality
3. Nine-year-old Jeffrey has just bounded into the room with his latest artistic creation. He chatters about his friends at school and how much he likes reading and working math problems. According to Freud, Jeffrey is most likely in the _____ stage of psychosexual development.
 - a. oral
 - b. anal
 - c. phallic
 - d. latency
4. Elizabeth's therapist suggests that Elizabeth's inability to trust her boyfriend could stem from her parents' neglecting her when she was a child. This therapist most likely follows the _____ theory of personality.
 - a. reciprocal deterministic
 - b. social-cognitive
 - c. humanistic
 - d. object relations
5. Oscar strives to be the best at everything he does. He believes that he is successful because he is intelligent, works hard, and never gives up. Oscar most likely has a(n) _____ self system.
 - a. independent
 - b. interdependent
 - c. reciprocal
 - d. growth-oriented
6. Which of the following is *not* a common criticism of Freud's psychodynamic approach to personality?
 - a. His sample of patients was small and unrepresentative of the general population.
 - b. His theory reflects Western European and North American cultural values.
 - c. The theory was not developed scientifically and thus is subject to bias.
 - d. The theory was not comprehensive and has had little influence on psychology.

- 7.** Rajeem believes that he is unique because no one else has exactly the same combination of internal characteristics (such as high intelligence, low sociability, average creativity) that he does. In other words, Rajeem believes in the _____ approach to personality.
- psychodynamic
 - trait
 - social-cognitive
 - humanistic
- 8.** A politician is described by her critics as dishonest, intelligent, industrious, extraverted, aggressive, generous, and charming. This method of describing personality most closely matches _____ model of personality.
- Eysenck's biological trait
 - Rotter's expectancy
 - Allport's trait
 - the five-factor
- 9.** Tamerika has been described as high in openness, low in conscientiousness, high in extraversion, high in agreeableness, and high in neuroticism. This description reflects _____ model of personality
- Eysenck's biological trait
 - Rotter's expectancy
 - Allport's trait
 - the five-factor
- 10.** David is very sociable and tends to seek out situations in which other people are appreciative of his work and his jokes. He is usually happy and loves to try new activities, such as bungee jumping. According to Gray, David has an active _____ system.
- external control
 - internal control
 - behavioral approach
 - flight or freeze system
- 11.** According to the Thinking Critically section of this chapter, research on the question of whether or not personality is inherited concludes that _____.
- there are specific genes for specific personality traits
 - there are genetic predispositions toward particular personality characteristics
 - the environment is the strongest influence on personality development
 - personality is essentially determined by the age of six months
- 12.** Sandy believes that if she works hard, she will be rewarded. So when she gets a D on her psychology test, she decides that she didn't study hard enough. When she wins the "Outstanding Senior of the Month" award, she believes that she earned it. According to one type of social-cognitive personality theory, Sandy would be described as _____.
- internal
 - external
 - deficiency oriented
 - growth oriented
- 13.** Darma was standing in line at a movie theater, thinking about how her boyfriend had dumped her, when she was accidentally shoved from behind. She shouted "Hey! Back off, you jerks!" This prompted angry comments from the people behind her, which made Darma even angrier, so she refused to move forward in line. This case is an example of _____.
- conditions of worth
 - growth orientation
 - reciprocal determinism
 - internal locus of control
- 14.** At college basketball games, Melinda jumps up and down and yells and screams continuously. Otherwise, however, she is a quiet person who chooses peaceful environments without much social stimulation. She finds that when she is around other people, they often become quiet, too. Melinda's personality can best be explained by _____ theory.
- psychodynamic
 - Allport's trait
 - Rotter's expectancy
 - Mischel's person-situation
- 15.** Rolf believes that his children's personalities are shaped by the way he rewards and punishes them. His wife, Jena, believes that the children were born with an innate drive toward growth and that their personalities are shaped by their unique perceptions of the world. Rolf's beliefs most closely match the _____ approach to personality, and Jena's most closely match the _____ approach.
- psychodynamic; trait
 - social-cognitive; trait
 - social-cognitive; humanistic
 - psychodynamic; humanistic
- 16.** When Lizzie finger-paints on the wall, her mother gets angry and shouts, "You are a very bad girl!" Rogers would say that Lizzie's mother is creating _____.
- growth-oriented development
 - deficiency-oriented development
 - conditions of worth
 - psychodynamic conflicts
- 17.** Ruben is preoccupied with what is missing from his life. He has a good job and just got a raise, but he still feels underpaid. He has a great wife, but he wishes she were more attractive. He bought a new car, but he just saw a better one that has become his latest obsession. Maslow would say that Ruben is controlled by _____.
- growth orientation
 - deficiency orientation
 - conditions of worth
 - self-actualization

- 18.** Which of the following techniques would a psycho-dynamic psychologist be most likely to use to assess personality?
- a. Behavioral observations
 - b. Nonprojective personality measures
 - c. Measurements of physiological activity
 - d. Projective personality measures
- 19.** Paul is an undercontrolled eight-year-old who regularly has tantrums. The longitudinal study described in this chapter's Focus on Research Methods section would suggest that, when Paul is an adult, he will most likely _____.
- a. join the military or live in some other highly structured environment
 - b. have outgrown his lack of control
 - c. be more aggressive than most other men
 - d. keep jobs longer than most other men
- 20.** Peggy is responsible for hiring new employees for her company. To guide her selections, she decides to use _____, which have been shown to have value in screening out employees who are likely to be unreliable or dishonest.
- a. structured interviews
 - b. nonprojective personality measures
 - c. projective personality measures
 - d. life outcome measures

Psychological Disorders



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Preview

Do you know someone who collects odd objects, or believes in things that most people don't, or dresses in strange or even shocking ways? Is this person crazy or just eccentric? When does oddness become abnormality? When does sadness become depression? What are psychological disorders? In this chapter,

we describe the major categories of psychological disorders, discuss some of their possible causes, consider how they have been explained over the centuries, and examine their role in the insanity defense.

José is a fifty-five-year-old electronics technician. A healthy and vigorous father of two adult children, he was forced to take medical leave because of a series of sudden, uncontrollable panic attacks in which dizziness, a racing heart, sweating, and other terrifying symptoms made him fear that he was about to die. José is suffering from a psychological disorder, also called a *mental disorder* or *psychopathology*. **Psychopathology** involves patterns of thought, emotion, and behavior that are maladaptive, disruptive, or uncomfortable either for the person affected or for others.

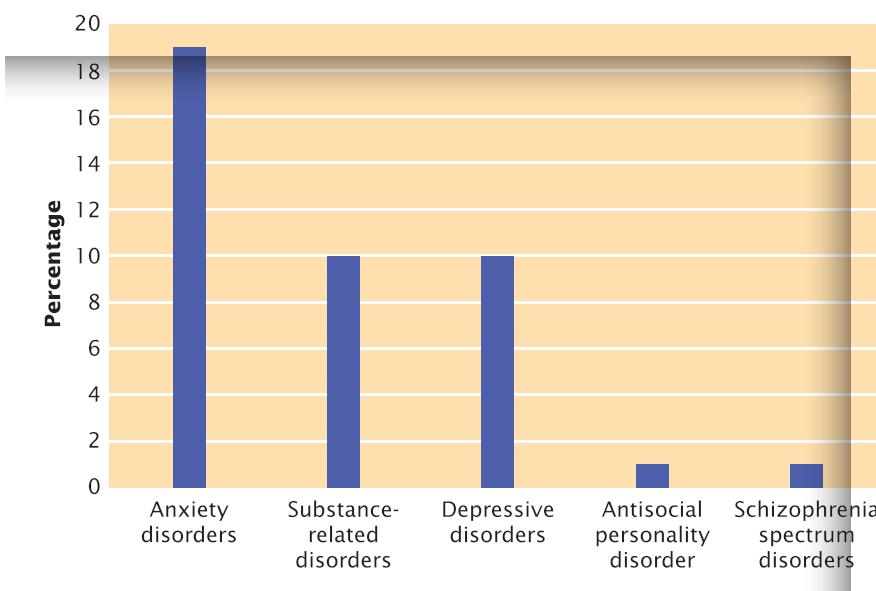
Psychological disorders appear in every country in the world, and the number of people who are affected is staggering (Alonso et al., 2013; Farmer et al., 2013; Kessler et al., 2012). Surveys reveal that each year in the United States alone, over 85 million people, or about 27 percent of the adult population, show some form of mental disorder and that as many as 46 percent have had a disorder at some point in their lives (Alonso et al., 2013; National Institute of Mental Health [NIMH], 2014; see Figure 14.1). In addition, about 13 percent of U.S. children show a significant mental disorder each year. About three-quarters of adult disorders first appear by age twenty-four; half begin as early as fourteen (Merikangas et al., 2010; NIMH, 2014; Twenge et al., 2010).

Individuals experiencing a severe mental disorder spend an average of 136 days out-of-role, meaning that students are not going to school, employees are not going to work, and full-time parents are unable to care for their families (Alonso et al., 2013). These rates of mental disorder have remained steady in recent years and are seen in all segments of society. As described later, though, some disorders are more prevalent in males or in females or in certain ethnic groups (NIMH 2014; Zahn-Waxler, Shirtcliff, & Marceau, 2008). The actual prevalence may be higher than the survey percentages suggest, because major studies have examined fewer than half of all known psychological disorders. In short, psychological disorders are very costly in human suffering, wasted potential, economic burden, and lost resources (Alonso et al., 2013; Kessler, 2012; Kessler, Chiu et al., 2008). You can learn more about the latest surveys conducted by the World Health Organization at the homepage of the World Mental Health Survey Initiative.

FIGURE 14.1
Annual Incidence of Specific Psychological Disorders

Several large-scale surveys of adults in the United States revealed that 27 percent of them experience some form of mental disorder in any given year and that almost half of them have displayed a disorder at some time in life. The data shown here summarize these findings by category of disorder. The same general patterns appear among the more than 400 million people worldwide who suffer from some form of psychological disorder (Farmer et al., 2013; Kessler et al., 2012; NIMH, 2014).

psychopathology Patterns of thinking and behaving that are maladaptive, disruptive, or uncomfortable for the affected person or for others.





Is This Person Abnormal?

Whether unusual individuals are labeled "abnormal" and perhaps given treatment for psychological disorders depends on a number of factors, including how abnormality is defined by the culture in which they live, who is most directly affected by their behavior, and how much distress they suffer or cause.

Xinhua / eyevine Xinhua / eyevine/eyevine/Redux

DEFINING PSYCHOLOGICAL DISORDERS

How do psychologists define abnormal behavior?

A California woman's husband dies. In her grief, she stays in bed all day, weeping, refusing to eat, at times holding "conversations" with him. In India, a Hindu holy man on a pilgrimage rolls along the ground for more than 1,000 miles of deserts and mountains, in all kinds of weather, until he reaches the sacred place he seeks. In London, an artist randomly scratches parked cars as part of his "creative process" (Telegraph Correspondent, 2005). One third of U.S. adults believe in UFOs, 14 percent say they have seen one (Associated Press, 2007), and hundreds claim to have been abducted by space aliens (Clancy, 2005). These examples and countless others raise the question of where to draw the line between normality and abnormality, between eccentricity and mental disorder.

What Is Abnormal?

The criteria for judging whether people's thinking, emotions, or behaviors are abnormal have been called the "three D's": deviance, distress, and dysfunction. Each criterion has value but also some flaws.

Deviance

If we define *normality* as what most people do, then the criterion for abnormality becomes *statistical infrequency*, or that which is deviant, meaning unusual or rare. By this criterion, the few people who believe that space aliens steal their thoughts would be judged as abnormal; the many people who worry about becoming victims of crime or terrorism would not. But statistical infrequency alone is a poor criterion for abnormality because it would define as abnormal any rare quality or characteristic, including creative genius or world-class athletic ability. Further, the infrequency criterion implies that conformity with the majority is normal, so equating rarity with abnormality may result in the oppression of nonconformists who express unusual or unpopular views or ideas. Finally, just how rare must a behavior be in order to call it "abnormal"? The dividing line is not easy to locate.

A related criterion for abnormality is the violation of social norms, the cultural rules that tell us how we should and shouldn't behave in various situations, especially in relation to others. According to this *norm violation* criterion, when people behave in ways that are unusual enough or disturbing enough to violate social norms, they may be described as abnormal. However, norm violation alone is an inadequate measure of abnormality. For one thing, some norm violations are better characterized as eccentric or illegal than as abnormal. People who seldom bathe or who stand too close during conversation violate social norms, but are they abnormal or merely annoying? Further, whose norms are we talking about? Social norms vary across cultures, subcultures, and historical eras, so certain behaviors that qualify as abnormal in one part of the world might be perfectly acceptable elsewhere (Chentsova-Dutton & Tsai, 2007).

Distress

Abnormality can also be described in terms of *personal suffering*. In fact, experiencing distress is the criterion that people often use in deciding that their psychological problems are severe enough to require treatment. But personal suffering alone is not an adequate criterion for abnormality. For one thing, it does not take into account the fact that people are sometimes distressed about characteristics (such as being gay or lesbian) that are not mental disorders. Second, some people display serious psychological disorders but experience little or no distress. Those who sexually abuse children, for example, create far more distress in victims and their families than they suffer themselves.

Dysfunction

A final criterion for abnormality is *impaired functioning*, which means having difficulty in fulfilling appropriate and expected roles in family, social, and work-related



Situational Factors in Defining Abnormality

TRY THIS Men in Delhi, India, can take advantage of outdoor urinals like this one. In some countries, it is even acceptable for men to urinate against buildings on city streets. In the United States and many other places, though, males who urinate anywhere other than the relative privacy of a men's room are considered to be deviant and might even be arrested for indecent exposure. In other words, situational factors can determine whether a particular behavior is labeled "normal" or "abnormal." Make a list of the reasons you would give for, or against, calling these men "abnormal." Which criteria for abnormality did you use?

Mark A. Johnson/Alamy

situations (Üstün & Kennedy, 2009). For example, it is normal for people to experience sadness at one time or another, but if their sadness becomes so intense or long lasting that it interferes with their ability to hold a job or care for their children, it is likely to be considered abnormal. It isn't quite fair, though, to call someone abnormal just because they are dysfunctional. Their dysfunction might be caused by physical illness, by an overwhelming but temporary family problem, or by a variety of things other than a psychological disorder. Further, some people who display significant psychological disorders are still able to function reasonably well at school, at work, or at home.

Behavior in Context: A Practical Approach

Obviously, no single criterion fully defines abnormality. So mental health practitioners and researchers tend to adopt a *practical approach* that combines aspects of all the criteria we've described. They consider the *content* of behavior (that is, what the person does), the sociocultural *context* in which the person's behavior occurs, and the *consequences* of the behavior for that person and for others.

They also recognize that the definition of behavior that is "appropriate," "expected," and "functional" depends on age, gender, culture, and the particular situation and historical era in which people live. For example, a short attention span and unemployment are considered normal in a two-year-old but inappropriate and problematic in an adult. In some countries, expressing certain emotions is considered more appropriate for women than for men. So kisses, tears, and long embraces are common when women in North America greet each other after a long absence; men tend to simply shake hands or hug briefly. And because of cultural differences, hearing a dead relative's voice calling from the afterlife would be more acceptable in certain American Indian tribes than among, say, the families of suburban Toronto. Situational factors are important as well. Falling to the floor and "speaking in tongues" is considered appropriate and even desirable during the worship services of some religious groups; but the same behavior would be seen as inappropriate (and possibly a sign of disorder) in a college classroom. Finally, judgments about behavior are shaped by changes in social trends and cultural values. At one time, the American Psychiatric Association listed homosexuality as a mental disorder, but it dropped this category from its official list of disorders in 1973. In taking this step, it was responding to changing views of sexual orientation prompted in part by the political and educational efforts of gay and lesbian rights groups.

In summary, it is difficult (and probably impossible) to define with certainty a specific set of behaviors that everyone, everywhere, will agree constitutes abnormality. Instead, the practical approach sees abnormality as including those patterns of thought, behavior, and emotion that lead to suffering and significantly impair people's ability to function as expected within their culture (Nordsletten, & Mataix-Cols, 2012).

EXPLAINING PSYCHOLOGICAL DISORDERS

What causes abnormality?

It is one thing to define psychological disorders; it is quite another to explain each of them. Centuries ago, explanations of abnormal behavior focused on gods or demons. Disordered people were seen either as innocent victims of evil spirits or as social or moral deviants suffering supernatural punishment. In Europe during the late Middle Ages, for example, it was widely believed that people who engaged in threatening or unusual behavior were controlled by the devil or other evil beings. Supernatural explanations of psychological disorders are still invoked today in many cultures around the world, including certain ethnic and religious subcultures in North America (Chentsova-Dutton & Tsai, 2007; Legare & Gelman, 2008). Other explanations have focused on mental incompetence, weak character, personal choices, illness or other physical problems, faulty learning, and difficult social conditions.

An Exorcism

The exorcism being performed by this Buddhist monk in Thailand is designed to cast out the evil forces that are seen as causing this child's disorder. Supernatural explanations of mental disorder remain influential among religious groups in many cultures and subcultures around the world (Fountain, 2000). Awareness of this influence in the United States and Europe has increased recently after cases in which people have died during exorcism rituals (e.g., Christopher, 2003; Radford, 2005).

Jean Leo Dugast/Sygma/Corbis



Explanations of psychological disorders tend to influence a society's attitudes and responses toward the people who display them (Blease, 2012; Fontaine, 2009). Where disorder is seen as a sign that a person is evil, that person may be the target of anger and punishment, but in societies in which the cause of disorder is thought to be demonic possession, the person may be the object of sympathy and might be offered an exorcism ceremony. If abnormality is viewed as a personal decision to behave in odd ways, those who do so are likely to be avoided, isolated, and ignored, but if psychological problems are assumed to be caused by illness or learned habits, troubled people are likely to receive drugs or to be offered programs designed to teach more appropriate behaviors. The view of psychological disorders that is most prevalent in a given society is often driven by the ways in which those disorders are portrayed in the news and entertainment media (Lewison et al., 2012; Sarrett, 2011).

The Biopsychosocial Approach

Today, most mental health researchers in Western cultures attribute the appearance of psychopathology to a combination of three main causes: biological factors, psychological processes, and sociocultural contexts. For many decades, there was controversy over which of these three causes was most important, but it is now widely agreed that they can all be important. Most researchers have adopted a **biopsychosocial approach** in which mental disorders are seen as caused by the combination and interaction of biological, psychological, and sociocultural factors, each of which contributes in varying degrees to particular problems in particular people (e.g., Kendler et al., 2011; Nolen-Hoeksema & Watkins, 2011; Wright et al., 2013).

Biological Factors

The biological factors thought to be involved in causing mental disorders include physical illnesses and disruptions or imbalances of bodily processes. This view of psychological disorders has a long history. For example, Hippocrates, a physician in ancient Greece, said that psychological disorders result from imbalances among four *humors*, or bodily fluids (blood, phlegm, black bile, and yellow bile). In ancient Chinese cultures, psychological disorders were seen as arising from an imbalance of *yin* and *yang*, the dual forces of the universe flowing in the physical body.

biopsychosocial approach Viewing mental disorders as resulting from a combination of biological, psychological, and sociocultural factors.

As the biologically oriented view gained prominence in Western cultures after the Middle Ages, special hospitals for the insane were established throughout Europe. Treatment in these early *asylums* consisted mainly of physical restraints, laxative purges, bleeding of “excess” blood, and induced vomiting. Cold baths, fasts, and other physical discomforts were also used in efforts to “shock” patients back to normality.

The biologically oriented view, sometimes called the *medical model*, also gave rise to the concept of abnormality as *mental illness*. Today the medical model is also sometimes called a *neurobiological model* because it explains psychological disorders in terms of particular disturbances in the anatomy and chemistry of the brain and in other biological processes, including genetic influences (e.g., Schlaepfer & Nemeroff, 2012; Williams, 2008). Neuroscientists and others who employ a neurobiological model investigate these disorders as they would investigate any physical illness, seeing problematic symptoms stemming primarily from an underlying illness that can be diagnosed, treated, and cured. This model is widely accepted in Western cultures today; most people tend to seek medical doctors and hospitals for the diagnosis and treatment of psychological disorders (Wang et al., 2011).

Visiting Bedlam

As shown in William Hogarth’s portrayal of “Bedlam” (slang for a hospital in London formerly known as St. Mary Bethlehem), most asylums of the 1700s were little more than prisons. Notice the well-dressed visitors. In those days, the public could buy tickets to look at mental patients, much as people go to the zoo today.

“The Interior of Bedlam,” from ‘A Rake’s Progress,’ by William Hogarth, 1763



Psychological Processes

The biological factors we have described are constantly influencing and being influenced by a variety of psychological processes, such as our wants, needs, and emotions; our learning experiences; and our way of looking at the world. The roots of the **psychological model** of mental disorders can be found in ancient Greek literature and drama dealing with *psyche*, or mind, and especially with the problems people experience as they struggle to resolve inner conflicts or to overcome the effects of stressful events.

These ideas took center stage in the late 1800s, when Sigmund Freud challenged the assumption that psychological disorders had only physical causes. As described in the chapter on personality, Freud viewed psychological disorders as resulting mainly from the effects of unresolved, mostly unconscious clashes between people’s inborn impulses and the limits placed on those impulses by the environment. These conflicts, he said, begin early in childhood. Today’s versions of this *psychodynamic approach* focus less on instinctual urges and more on the role of attachment and other early interpersonal relationships, but they retain the basic idea that internal conflicts can cause psychological disorders (Barber et al., 2013; Levy & Ablon, 2009).

psychological model A view in which mental disorder is seen as arising from psychological processes.

LINKAGES Are psychological disorders learned behaviors? (a link to Learning)

Other theories discussed in the personality chapter suggest other psychological processes that contribute to the appearance of mental disorders. For example, *social-cognitive* theorists, also known as *social-learning* theorists, see most psychological disorders as the result of past learning and current situations. These theorists say that just as people learn to avoid touching hot stoves after being burned by one, bad experiences in school or a dental office can “teach” people to fear such places. Social-cognitive theorists also emphasize the effects of expectancies and other mental processes (e.g., Johnson-Laird, Mancini, & Gangemi, 2006). They see depression, for example, as stemming from negative events, such as losing a job, and from learned patterns of thoughts about these events, such as “I never do anything right.”

According to the *humanistic*, or phenomenological, approach to personality, behavior disorders appear when a person’s natural tendency toward healthy growth is blocked, usually by a failure to be aware of and to express true feelings. When this happens, the person’s perceptions of reality become distorted. The greater the distortion, the more serious the psychological disorder.

Sociocultural Context

LINKAGES How do societies define what is abnormal? (a link to Social Psychology)

Together, neurobiological and psychological factors can go a long way toward explaining many forms of mental disorder. Still, they focus mainly on causes residing within the individual. The **sociocultural perspective** on disorder emphasizes the importance of examining the individual’s environment, including the social and cultural factors that form the context of abnormal behavior. Looking for causes of disorders in this *sociocultural context* means paying attention to **sociocultural factors** such as gender, age, and marital status; the physical, social, and economic situations in which people live; and the cultural values, traditions, and expectations in which they are immersed (Alcantara & Goné, 2014; Appignanesi, 2009; Sue & Sue, 2008). Sociocultural context influences not only what is and is not labeled “abnormal” but also who displays what kind of disorder.

Consider gender, for instance. The greater tolerance in many cultures for the open expression of emotional distress among women but not men may contribute to the fact that women report higher rates of depression than men do (Nolen-Hoeksema, 2012). Similarly, the view held in many cultures that excessive alcohol consumption is less appropriate for women than for men is a sociocultural factor that may set the stage for rates of alcohol abuse that are higher in men than women (Graham et al., 2011; Timko, Finney, & Moos, 2005).

Sociocultural factors also influence the form that abnormality takes (Kyrios et al., 2001). For example, depression is considered a *culture-general* disorder because it appears virtually everywhere in the world. However, specific symptoms tend to differ depending on a person’s cultural background (Alcantara & Goné, 2014; Whaley & Hall, 2009). In Western cultures, where the emotional and physical components of disorders are generally viewed separately, symptoms of depression tend to revolve around despair and other signs of emotional distress (Kleinman, 1991). But in China and certain other Asian cultures where emotional and physical experiences tend to be viewed as one, depressed people are as likely to report stomach or back pain as to complain of sadness (Nakao & Yano, 2006; Weiss et al., 2009; Ryder et al., 2008).

There are also *culture-specific* forms of disorder. For instance, Puerto Rican and Dominican Hispanic women sometimes experience *ataques de nervios* (“attacks of nerves”), a unique way of reacting to stress that includes heart palpitations, shaking, shouting, nervousness, depression, and possibly fainting or seizure-like episodes (Lizardi, Oquendo, & Graver, 2009). In Asia, Khmer refugees sometimes suffer from panic-related fainting spells known as *kyol goeu* (Hinton, Um, & Ba, 2001). And genital retraction syndromes are occasionally observed in a number of places around the world. In Southeast Asia, southern China, and Malaysia, men suffering from *koro* fear that their penis will shrivel, retract into the body, and cause death (Dzokoto & Adams, 2005; Garlipp, 2008). In females the fear relates to shriveling of the breasts.

In short, sociocultural factors create differing stressors, social roles, opportunities, experiences, and avenues of expression for different groups of people. They also help shape the disorders and symptoms to which certain categories of people are prone, and they even affect responses to treatment (e.g., Hopper & Wanderling, 2000).

sociocultural perspective Explaining mental disorders in ways that emphasize the role of factors such as gender and age, physical situations, cultural values and expectations, and historical era.

sociocultural factors Characteristics or conditions that can influence the appearance and form of maladaptive behavior.

diathesis-stress model The notion that psychological disorders arise when a predisposition for a disorder combines with sufficient amounts of stress to trigger symptoms.

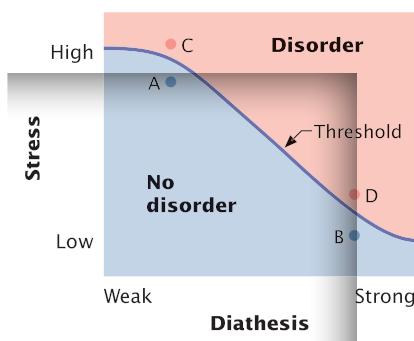


FIGURE 14.2
Diathesis, Stress, and Disorder

The diathesis-stress model's explanations suggest that psychological disorders can result from many combinations of predisposition and stress. Point D shows disorder stemming from a strong predisposition and relatively little stress. At Point C, disorder resulted from a weak predisposition but a lot of stress. Points A and B represent blends of diathesis and stress that are not potent enough to trigger disorder.

The Diathesis-Stress Model as an Integrative Explanation

The biopsychosocial approach is currently the most comprehensive and influential way of explaining psychological disorders. It is prominent partly because it encompasses so many important causal factors, including biological imbalances, genetically inherited characteristics, brain damage, psychological traits, socioculturally influenced learning experiences, stressful life events, and many more.

But how do all these factors actually interact to create disorder? Most researchers who study psychopathology believe that inherited characteristics, biological processes, learning experiences, and sociocultural forces combine to create a predisposition, or *diathesis* (pronounced “dye-ATH-uh-sis”), for psychological disorders. Whether a person eventually develops symptoms of disorder, they say, depends on the nature and amount of stress the person encounters (Elwood et al., 2009; Roisman et al., 2012). For example, a person may have inherited a biological tendency toward depression or may have learned depressing patterns of thinking, but these predispositions might not result in a depressive disorder unless the person is faced with a severe financial crisis or suffers the loss of a loved one. If major stressors don't occur or if the person has good stress-coping skills, depressive symptoms may never appear or may be relatively mild (Canli et al., 2006).

So according to the **diathesis-stress model**, biological, psychological, and sociocultural factors can predispose us toward a psychological disorder, but it takes a certain amount of stress to actually trigger it. For those with a strong diathesis, relatively mild stress might be enough to create a problem. Those whose predisposition is weaker might not show signs of disorder until stress becomes extreme or prolonged (see Figure 14.2). Another way to think about the diathesis-stress model is in terms of *risk*: The more risk factors for a disorder a person has—whether they take the form of genetic tendencies, personality traits, cultural traditions, or stressful life events—the more likely it is that the person will display a form of psychological disorder associated with those risk factors.

Table 14.1 shows how a particular case of psychopathology might be explained by various biopsychosocial factors and how it might be summarized in terms of diathesis

TABLE 14.1 EXPLAINING PSYCHOPATHOLOGY

Here are the factors that would be highlighted by the biopsychosocial approach in the case of José, the man described at the beginning of this chapter. At the bottom is a summary of how these factors might be combined within a diathesis-stress framework.

Explanatory Domain	Possible Contributing Factors
Neurobiological/medical	José may have a genetic tendency toward anxiety, an endocrine dysfunction, a neurotransmitter imbalance, a brain tumor, or some other biological disorder.
Psychological: psychodynamic	José has unconscious conflicts and desires. Instinctual impulses are breaking through ego defenses into consciousness, causing panic.
Psychological: social-cognitive	José interprets physical stress symptoms as signs of serious illness or impending death. His panic is rewarded by stress reduction when he stays home from work.
Psychological: humanistic	José fails to recognize his genuine feelings about work and his place in life, and he fears expressing himself.
Sociocultural	A culturally based belief that “a man should not show weakness” amplifies the intensity of stress reactions and delays José’s decision to seek help.
Diathesis-stress summary	José has a biological (possibly genetic) predisposition to be overly responsive to stressors. The stress of work and extra activity exceeds his capacity to cope and triggers panic as a stress response.

and stress. Later, you'll see these same biopsychosocial factors combined within a diathesis-stress framework to explain a number of other psychological disorders.

CLASSIFYING PSYCHOLOGICAL DISORDERS

How many psychological disorders have been identified?

Although definitions of abnormality differ within and across cultures, there does seem to be a set of behavior patterns that roughly defines the range of most abnormality in most cultures. The majority of these behavior patterns qualify as disorders because they result in impaired functioning, a main criterion of the practical approach to defining abnormality. It has long been the goal of those who study abnormal behavior to classify these patterns into a set of precise diagnostic categories. Ideally, establishing these categories should make it easier to diagnose which disorder a particular person is displaying and thus which treatment method would be most appropriate.

Diagnoses are also important for research on the causes of psychopathology. If researchers can accurately classify people into particular disorder categories, they will have a better chance of spotting genetic features, biological abnormalities, cognitive processes, and environmental experiences that people in the same category might share. Finding that people in one category share a set of features that differs from those shared by people in other categories could provide clues about which features are related to the development of each disorder.

Seeking to create a standardized way to diagnose psychological disorders, in 1952 the American Psychiatric Association published the first edition of what has become a heavily relied upon North American diagnostic classification system, the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*. The manual has grown in size over the years; the current edition, DSM-5, was released in 2013 and includes over 300 specific diagnostic labels (American Psychiatric Association, 2013). Mental health professionals outside North America diagnose mental disorders using classification systems that appear in the tenth edition of the World Health Organization's *International Classification of Diseases (ICD-10)* and its companion volume, the International Classification of Functioning, Disability, and Health (ICF). The ICD-10 is scheduled to be replaced by the ICD-11 by 2017. To facilitate international communication and cross-cultural research with respect to psychopathology, efforts are under way to remove any inconsistencies between the DSM and the ICD (Kupfer & Regier, 2010; Löwe et al., 2008), and the DSM-5 lists ICD code numbers alongside the DSM diagnostic codes. (The latest information about DSM-5 and the upcoming edition of the ICD is available at the websites of the American Psychiatric Association and the World Health Organization.)

A Classification System: The DSM-5

In the *DSM-5*, the American Psychiatric Association has attempted to describe the patterns of thinking, emotion, and behavior that define various mental disorders. For each disorder, the *DSM-5* provides specific criteria outlining the conditions that must be present before a person is given that diagnostic label (see Table 14.2).

Not everyone is happy with the latest version of the DSM. Some quarrel with the decisions its authors made about how to define certain disorders. Other critics say that the *DSM-5* just continues the long tradition of focusing diagnosis only on people's weaknesses and problems while ignoring their character strengths, virtues, prosocial values, and other psychological resources upon which they can potentially build during treatment. Some researchers in the field of *positive psychology* have even offered comprehensive lists of human strengths and values from which diagnosticians can choose (Diener, 2013; Kobau et al., 2011; Seligman, 2011).

TABLE 14.2 THE DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS (DSM) OF THE AMERICAN PSYCHIATRIC ASSOCIATION

The fifth edition (DSM-5) lists the following major categories of mental disorders:

Neurodevelopmental Disorders. Includes problems in normal social and behavioral development ranging from attention deficit hyperactivity and communication disorders to autism spectrum disorders (severe impairment in social, behavioral, and language development), specific learning disorders, and intellectual disability (previously known as mental retardation; see the chapter on intelligence).

Schizophrenia Spectrum and Other Psychotic Disorders. Severe conditions characterized by abnormalities in thinking, perception, emotion, movement, and motivation that greatly interfere with daily functioning. Problems involve false beliefs (delusions) and false perceptions (hallucinations).

Bipolar and Related Disorders. Severe disturbances of mood and activity patterns, especially episodes of overexcitement (mania), and alternating episodes of mania and depression (bipolar disorder).

Depressive Disorders. Problems that take the form of moderate to severely depressed mood for significant periods, including, among others, major depressive disorder, persistent depressive disorder, disruptive mood dysregulation disorder, and premenstrual dysphoric disorder.

Anxiety Disorders. Disorders involving specific fears (phobias), panic attacks, generalized feelings of dread, and severe social anxiety.

Obsessive-Compulsive and Related Disorders. Includes rituals of thought and action associated with combating anxiety (obsessive-compulsive disorder) or perceived bodily flaws (body dysmorphic disorder), as well as other problematic patterns such as hoarding.

Trauma- and Stressor-Related Disorders. Problems caused by traumatic events, such as natural disasters, sexual assault, or military combat (posttraumatic stress disorder); also includes a wide range of adjustment disorders involving failure to adjust to or deal well with such stressors as divorce, financial problems, family discord, or other stressful life events (see the chapter on health, stress, and coping).

Dissociative Disorders. Psychologically caused problems of consciousness and self-identification—for example, loss of memory (dissociative amnesia) or the development of more than one identity (dissociative identity disorder).

Somatic Symptom and Related Disorders. Physical symptoms such as paralysis and blindness that have no physical cause (conversion disorder), unusual preoccupation with physical health or with nonexistent physical problems (e.g., illness anxiety disorder, somatic symptom disorder), and false mental disorders that are intentionally produced to satisfy some psychological need (factitious disorder).

Feeding and Eating Disorders. Patterns of eating too little (anorexia nervosa), binge eating followed by self-induced vomiting (bulimia and binge-eating disorder), and problems associated with abnormal elimination, persistent regurgitation, or eating non-food substances.

Elimination Disorders. Problems involving inability to hold urine (enuresis) or feces (encopresis) after the age at which these skills are considered developmentally appropriate.

Sleep-Wake Disorders. Problems involving inability to sleep at night (insomnia disorder) or to stay awake during the day, breathing-related problems such as sleep apnea, and problems in the timing of sleep-wake cycles (see the chapter on consciousness).

Sexual Dysfunctions. Problems associated with painful or otherwise unsatisfactory sexual activity, including premature ejaculation or reduced arousal.

Gender Dysphoria. Problems associated with gender incongruence, including aversion to one's gender and identification with an alternate gender.

Disruptive, Impulse-Control, and Conduct Disorders. Problems in emotional and behavioral self-control, often first appearing in childhood, including those such as oppositional defiant disorder, conduct disorder, stealing (kleptomania), and fire setting (pyromania).

(continued)

TABLE 14.2 THE DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS (DSM) OF THE AMERICAN PSYCHIATRIC ASSOCIATION (CONT.)

Substance-Related and Addictive Disorders. Psychological, behavioral, physical, social, or legal problems caused by use of a variety of chemical substances, including alcohol, heroin, cocaine, amphetamines, painkillers, hallucinogens, marijuana, and tobacco. Also includes compulsive gambling (known as gambling disorder).

Neurocognitive Disorders. Problems caused by deterioration of the brain due to aging, disease, drugs or other chemicals, or other causes. These problems can appear as an inability to “think straight” (delirium) or as loss of memory and other intellectual functions (e.g., mild cognitive impairment, dementia).

Personality Disorders. Diagnostic labels given to individuals who show longstanding behavior patterns that are unsatisfactory to them or that disturb other people. These patterns may involve unusual suspiciousness, unusual ways of thinking, self-centeredness, shyness, overdependency, excessive concern with neatness and detail, or overemotionality, among others.

Paraphilic Disorders. Problems associated with attraction to sexual situations involving socially or legally inappropriate activities or targets (e.g., children, unwilling partners, or exposing oneself to strangers).

Source: From the Diagnostic and Statistical Manual of Mental Disorders, Text Revision, Fourth Edition. American Psychiatric Association.

Evaluating the Diagnostic System

How good is the diagnostic system? There has not yet been extensive research on the DSM-5 version, but so far, it appears that the strengths and weaknesses of DSM-5 are similar to those of DSM-IV. One way to evaluate any diagnostic system is to consider *interrater reliability*, the degree to which different mental health professionals agree on what diagnostic label a particular person should have. Research shows that the reliability of the *DSM-5* is acceptable or high for categories such as anxiety disorders, bipolar disorder, some childhood disorders, and schizophrenia spectrum disorders, but much lower for others such as major depressive disorder and some personality disorders (Regier et al., 2013). Overall, interrater agreement appears highest when diagnosis is based on structured interviews that systematically address each area of functioning and provide uniform guidelines for interpreting people’s responses (Narrow et al., 2013).

Do diagnostic labels give accurate information that guides correct inferences about people? This *validity* question is difficult to answer because accuracy can be judged in different ways. A diagnosis could be evaluated, for example, on how well it predicts a person’s behavior or perhaps on whether the person is helped by treatment that has helped others in the same diagnostic category. Though evidence does support the validity of most criteria in the *DSM-5* (Clarke et al., 2013; Zoellner et al., 2013), there is still room for improvement. In an effort to increase diagnostic validity, the National Institute of Mental Health has organized an initiative to identify underlying factors (such as emotion regulation or neurobiological processes) that operate across many types of psychopathology and also to focus on observable behaviors rather than diagnostic labels. Known as the NIMH Research Domain Criteria (RDoC), this new system would allow researchers and clinicians to communicate about individuals’ behavior on the basis of factors that may have more validity than the *DSM-5* labels (Cuthbert & Kozak, 2013). Other researchers are exploring the question of whether there is a common feature in all forms of psychopathology. This so-called “*p factor*” refers to a single dimension that is suspected to be a fundamental part of the structure of psychopathology and that may be associated with a history of family problems, early problems in brain functioning, life impairments, and troubled childhoods (Caspi et al., 2014).

Any diagnostic system is bound to be imperfect, however (Cuthbert & Kozak, 2013), because, first, people's problems often do not fit neatly into a single category. For example, a person may suffer both anxiety and depression (e.g., Waszczuk et al., 2014). Second, the same symptom (such as sleep difficulty) can appear as part of more than one disorder. Third, although the DSM provides many useful diagnostic criteria, some of them—such as “clinically significant impairment”—are open to judgment and interpretation. When mental health professionals must decide for themselves whether a particular person's symptoms fit a particular diagnosis, personal bias can creep into the system (Narrow et al., 2013). All of these factors may lead to misdiagnosis in some cases. Concern over this possibility has grown as the nations of North America and Western Europe have become increasingly multicultural. Diagnosticians in these countries are meeting more people whose cultural backgrounds they may not fully understand and whose behavior they may misinterpret (Broekman et al., 2011; Crowther, Lipworth, & Kerridge, 2011).

Some people whose behavior differs enough from cultural norms to cause annoyance feel that society should tolerate their “neurodiversity” instead of giving them a diagnostic label (Kapp et al., 2013; Langan, 2011; Mackenzie & Watts, 2011). In the same vein, Thomas Szasz (pronounced “zaws”) and other critics have argued that the entire process of labeling people instead of describing problems is dehumanizing because it ignores people's strengths and the features that make each individual unique (e.g., McElvaney, 2011; Perry, 2011; Snyder & Lopez, 2007; Szasz, 2003). According to Szasz, calling people “schizophrenics,” for example, may actually encourage the behaviors associated with these labels, undermine the confidence of clients and therapists about a person's chances for improvement, and may even force people—especially those who hold nonconformist or politically unpopular views—to undergo unnecessary treatment (Dickinson & Hurley, 2012; Szasz, 2009). Though most mental health professionals disagree with Szasz on this last point, his arguments are worth noting because psychiatric diagnosis has indeed been used in the past, and even in some countries today, to suppress social dissent or unpopular beliefs and lifestyles.

In summary, it is unlikely that any diagnostic system will ever satisfy everyone. No shorthand label can fully describe a person's problems or predict exactly how that person will behave. All that can be reasonably expected of a diagnostic system is that it provides informative general descriptions of the types of problems displayed by people who have been placed in various categories (Regier et al., 2013).

THINKING CRITICALLY IS PSYCHOLOGICAL DIAGNOSIS BIASED?

Some researchers and clinicians worry that problems with the reliability and validity of the diagnostic system are due partly to bias in its construction and use (Koukopoulos, Sani, & Ghaemi, 2013; Nemeroff et al., 2013). Beyond the concerns that people may have symptoms that span more than one preconceived diagnosis, the very criteria used for diagnosing disorders may not be appropriate for all people if they were based on research that focused on only one gender, one ethnic group, or one age group. Moreover, diagnosticians, like other people, hold expectations and make assumptions about males versus females and about individuals from differing cultures or ethnic groups. Such cognitive biases could color their judgments and might lead them to apply diagnostic criteria in ways that are slightly but significantly different from one case to the next (e.g., Caetano, 2011; During et al., 2011; Lewis-Fernández et al., 2010).

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What am I being asked to believe or accept?

Here we focus on ethnicity as a possible source of bias in diagnosing psychopathology. It is of special interest because there is evidence that like social class and gender, ethnicity is an important sociocultural factor in the development of mental disorder. The assertion to be considered is that clinicians in the United States base their diagnoses partly on a client's ethnic background and more specifically that bias affects these clinicians' diagnoses of African Americans.

What evidence is available to support the assertion?

Several facts suggest the possibility of ethnic bias in psychological diagnosis. For one thing, African Americans receive the diagnosis of schizophrenia more frequently than European Americans do (Chien & Bell, 2008). And certain kinds of odd symptoms tend to be diagnosed as a mood disorder in European Americans but as schizophrenia in African Americans (Gara et al., 2012; Schwartz & Feisthamel, 2009). Further, relative to their presence in the general population, African Americans are overrepresented in public mental hospitals, where the most serious forms of disorder are seen, and underrepresented in private hospitals and outpatient clinics, where less severe problems are treated (Barnes, 2004; Miehls, 2011). African Americans are also more likely than European Americans to be discharged from mental hospitals without a definite diagnosis, suggesting that clinicians have more difficulty in diagnosing their disorders (Sohler & Bromet, 2003). Emergency room physicians, too, appear less likely to recognize psychiatric disorders in African American patients than in patients from other groups (Kunen et al., 2005).

There is also evidence that members of ethnic minorities, including African Americans, are underrepresented in research on psychopathology (Iwamasa, Sorocco, & Koonce, 2002). This lack of minority representation may leave clinicians less aware of sociocultural factors that could influence diagnosis. For example, they might more easily misinterpret an African American's unwillingness to trust a European American diagnostician as evidence of paranoid symptoms (Whaley, 2001, 2011).

Are there alternative ways of interpreting the evidence?

Differences among ethnic groups in diagnosis or treatment do not automatically indicate bias based on ethnicity. Perhaps there are real differences in psychological functioning among different ethnic groups. If African Americans are exposed to more risk factors for disorder, including poverty, violence, and other major stressors than other groups are, they could be especially vulnerable to more serious forms of mental disorder (Plant & Sachs-Ericsson, 2004; Turner & Lloyd, 2004). And poverty, not diagnostic bias, could be responsible for the fact that African Americans are more often seen at less expensive public hospitals than at more expensive private ones. Finally, there is no guarantee that diagnostic criteria would be significantly different if more African Americans had been included in psychopathology research samples.

What additional evidence would help evaluate the alternatives?

So do African Americans actually display more signs of mental disorder than other groups do, or do diagnosticians just perceive them as more disordered? One way of approaching this question is to conduct experiments in which diagnosticians assign labels to clients on the basis of case histories, test scores, and the like. In some studies, the cases are selected so that pairs of clients show about the same amount of disorder but one member of the pair is described as European American and the other as African American. In other studies, the same case materials, described as representing either African American or European American clients, are presented to different diagnosticians. Bias in diagnosis would be suggested if, for example, the clinicians saw patients who were described as African American as more seriously disordered than others.

Most studies of this type have found little or no ethnic bias (e.g., Angold et al., 2002; Kales et al., 2005a, 2005b). These results are difficult to interpret, however, because the diagnosticians might have been aware of the purpose of the study and so might have gone out of their way to be unbiased (Abreu, 1999; Gushue, 2004). In fact, researchers *have* found evidence of some diagnostic bias against African Americans when clinicians were unaware of the purpose of the research (e.g., Baskin, Bluestone, & Nelson, 1981; Jones, 1982). But bias can result in

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underdiagnosis as well as overdiagnosis. One review of research found that African American children exhibited more signs of attention deficit/hyperactivity disorder than European American children did, yet were given that diagnosis less often (Miller, Nigg, & Miller, 2009). In another study, socially disruptive African American youngsters were less likely than disruptive European American adolescents to be diagnosed with conduct disorder (Pottick et al., 2007). These results suggest that some diagnosticians might believe that a certain amount of overactivity, inattention, and misbehavior is to be expected of African Americans and that this behavior is therefore "normal" for them.

Bias has also appeared in studies aimed at identifying the factors that influence clinicians' judgments following extensive interviews with patients. For example, one hospital study found that in arriving at their diagnoses, psychiatrists were more likely to attribute hallucinations and paranoid thinking to African American patients than to non-African American patients and they were more likely to attribute symptoms of depressive disorders to non-African Americans (Trierweiler et al., 2000). Another study showed that after being diagnosed with schizophrenia, African Americans were more likely than European Americans to be hospitalized, even when symptoms were about equally severe (Rost et al., 2011).

As noted earlier, some of these differences could reflect ethnic differences in the rate of disorder in the population. However, when people were interviewed in their own homes as part of large-scale mental health surveys, the diagnosis of schizophrenia was given only slightly more often to African Americans than to European Americans (Robins & Regier, 1991; Snowden & Cheung, 1990). So the presence of ethnic bias is suggested, at least for some diagnoses, for patients who are evaluated in mental hospitals but not necessarily for those who are interviewed in their own homes (Trierweiler et al., 2000, 2005).

What conclusions are most reasonable?

Just as the DSM is imperfect, so are the people who use it. As described in the chapters on social psychology and on thought and language, cognitive biases and stereotypes affect human thinking to some extent in virtually every social situation. It is not surprising, then, that they operate in diagnosis as well. Diagnostic bias does not necessarily reflect deliberate discrimination, however. Like the processes of prejudice discussed in the social psychology chapter, diagnostic bias based on ethnicity can operate unconsciously, without the diagnostician's being aware of it (Abreu, 1999; Boysen, 2009). So no matter how precisely researchers specify the criteria for assigning diagnostic labels, biases and stereotypes are likely to threaten the objectivity of the diagnostic process (Poland & Caplan, 2004; Trierweiler et al., 2000).

Minimizing diagnostic bias requires a better understanding of it. Diagnosticians should focus more intently than ever on the fact that their concepts of "normality" and "abnormality" are affected by sociocultural values that a given client might not share (Kales et al., 2006; Whaley & Hall, 2009). They must also become more aware that the same cognitive shortcuts and biases that affect everyone else's thinking and decision-making can impair their own clinical judgments (Lopez, 1989). In fact, research on memory, problem solving, decision making, social attributions, and other aspects of culture and cognition may hold the key to reducing bias in the diagnosis of psychological disorders. Meanwhile, perhaps the best way to counteract clinicians' cognitive shortcomings is to teach them to base their diagnoses solely on standard diagnostic criteria and decision rules rather than just relying on their (potentially biased) clinical impressions (Akin & Turner, 2006; Kramer, Bernstein, & Phares, 2014).

We don't have space to cover all of the DSM-5 categories, so we will focus on several of the most prevalent and socially significant examples. As you read, try not to catch "medical student's disease." Just as medical students often think that they have the symptoms of every illness they read about, some psychology students worry that certain aspects of their behavior (or that of a relative or friend) might reflect a mental disorder. A related phenomenon has been called *cyberchondria* (Hart & Björvinsson, 2010; Vasconcellos-Silva et al., 2010) because people's worries so often stem from their unguided use of the Internet to learn about psychiatric disorders (Norr, Capron, & Schmidt, 2014). Just remember that



It's a Long Way Down

Almost everyone is afraid of something, but between 9 and 15 percent of people in the United States have a specific phobia in which fear interferes significantly with daily life (Kessler & Wang, 2008). For example, people with acrophobia (fear of heights) would not do well in a job that requires being in this high position.

Louie Psihogios/Latitude/Corbis

everyone has problems sometimes. Before deciding that you or someone you know has a serious disorder or needs psychological help, consider whether the content, context, and functional impairment associated with the behavior would qualify it as abnormal according to the criteria of the practical approach.

ANXIETY DISORDERS

What is a phobia?

If you've ever been tense before an exam, a date, or a job interview, you have some idea of what anxiety feels like. An increased heart rate, sweating, rapid breathing, dry mouth, and a sense of dread are all common features of anxiety. Brief episodes of moderate anxiety are a normal part of life for most people. But when anxiety is so intense and long-standing that it disrupts a person's daily functioning, it can create **anxiety disorders** (Morrison & Heimberg, 2013).

Types of Anxiety Disorders

Here, we discuss three types of anxiety disorders: *specific phobia*, *generalized anxiety disorder*, and *panic disorder*. Together, anxiety disorders are the most common psychological disorders in North America; about 29 percent of the adults and 25 percent of children and adolescents in the United States will have an anxiety disorder at some point in their lives (Kessler et al., 2009; National Institute of Mental Health, 2014).

Phobia

An intense, irrational fear of an object or situation that is not likely to be dangerous is called a **phobia**. DSM-5 includes the diagnoses of *specific phobia*, *social anxiety disorder (social phobia)*, and *agoraphobia*. Examples of **specific phobias** are shown in Table 14.3 and include fear and avoidance of heights, blood, animals, automobile or air travel, and other specific stimuli and situations. In most developed nations, they are the most prevalent anxiety disorders, affecting 9 to 15 percent of adults and children (e.g., Burstein et al., 2011; Kessler & Wang, 2008; National Institute of Mental Health, 2014).

Social anxiety disorder (social phobia) involves anxiety about being criticized by others or acting in a way that is embarrassing or humiliating. Though many of us may have such anxiety to some degree, in a social phobia the discomfort is so intense and persistent that it impairs a person's normal functioning. Common social phobias include fear of public speaking or performance ("stage fright"), fear of eating in front of others, and fear of using public rest rooms. *Generalized social phobia* is a particularly severe form of social phobia in which fear occurs in virtually all social situations (Jacobs et al., 2009; Mineka & Zinbarg, 2006; Noyes & Hoehn-Saric, 2006). Sociocultural factors can alter the form of social phobias. For example, in Japan, where cultural training emphasizes group-oriented values and goals, a common social phobia is *taijin kyofusho*, fear of embarrassing those around you (Essau et al., 2012; Kleinknecht, 1994).

Agoraphobia is a strong fear of being away from a safe place, such as home; of being away from a familiar person, such as a spouse or close friend; or of being in crowds or in other situations that are difficult to leave. Because people who suffer from agoraphobia prefer to stay at home, thus avoiding the intense anxiety associated with shopping, driving, or using public transportation, the condition is sometimes wrongly called a fear of "open spaces." Many individuals who display agoraphobia have a history of panic attacks, which we describe later (Fava et al., 2008). In Western cultures, agoraphobia is more often reported by women, many of whom are totally homebound by the time they seek help. Although agoraphobia occurs less frequently than specific phobias (affecting only about 1.4 percent of adults and about 2.4 percent of children and adolescents in the United States), it is the phobia that most often leads people to seek treatment—mainly because it so severely disrupts everyday life (National Institute of Mental Health, 2014).

TABLE 14.3 SOME PHOBIAS

Phobia, the Greek word for "morbid fear," refers to *Phobos*, the Greek god of terror. The names of most phobias begin with the Greek word for the feared object or situation.

Name	Feared Stimulus
Acrophobia	Heights
Aerophobia	Flying
Claustrophobia	Enclosed places
Cynophobia	Dogs
Entomophobia	Insects
Gamophobia	Marriage
Gephyrophobia	Crossing a bridge
Hematophobia	Blood
Kenophobia	Empty rooms
Melissophobia	Bees
Ophidiphobia	Snakes
Xenophobia	Strangers

Generalized Anxiety Disorder

Strong and long-lasting anxiety that is not focused on any particular object or situation marks **generalized anxiety disorder**. Because the problem occurs in virtually all situations and because the person cannot pinpoint its source, this disorder is sometimes called *free-floating anxiety* and is essentially a disorder of worry (Ouimet, Covin, & Dozois, 2012). For weeks at a time, the person feels anxious and preoccupied, sure that some disaster is about to occur. The person becomes jumpy and irritable and cannot sleep soundly. Fatigue, inability to concentrate, and physiological signs of anxiety are also common. Generalized anxiety disorder affects about 3 percent of adults in the United States in any given year and about 6 percent of the population at some point in their lives (Hollander & Simeon, 2008; Kessler & Wang, 2008; NIMH, 2014). It is more common in women, often accompanying other problems such as depression or substance abuse (Ouimet et al., 2012).

anxiety disorders Conditions in which intense feelings of fear and dread are long-standing or disruptive.

phobia An anxiety disorder that involves strong, irrational fear of an object or situation that does not objectively justify such a reaction.

specific phobias Phobias that involve fear and avoidance of specific stimuli and situations such as heights, blood, and certain animals.

social anxiety disorder (social phobia) Strong, irrational fears related to social situations.

agoraphobia A strong fear of being alone or away from the safety of home.

generalized anxiety disorder A condition that involves long-lasting anxiety that is not focused on any particular object or situation.

panic disorder Anxiety in the form of sudden, severe panic attacks that appear without obvious cause.

obsessive-compulsive disorder (OCD) A disorder in which a person becomes obsessed with certain thoughts or feels a compulsion to do certain things.

obsessions Persistent, upsetting, and unwanted thoughts that interfere with daily life and may lead to compulsions.

compulsions Repetitive behaviors that interfere with daily functioning but are performed in an effort to prevent dangers or events associated with obsessions.

body dysmorphic disorder An obsessive-compulsive disorder characterized by intense distress over imagined abnormalities of the skin, hair, face, or other areas of the body.

Panic Disorder

For some people, anxiety takes the form of **panic disorder**. Like José, whom we met at the beginning of this chapter, people suffering from panic disorder experience recurrent, terrifying *panic attacks* that seem to come without warning or obvious cause. These attacks are marked by intense heart palpitations, pressure or pain in the chest, sweating, dizziness, and feeling faint. Often, victims believe they are having a heart attack. They may worry so much about having panic episodes that they limit their activities to avoid possible embarrassment (Kinley et al., 2009). As noted earlier, the fear of experiencing panic attacks may lead to agoraphobia as the person begins to fear and avoid places where help won't be available should panic recur (Koerner, Vorstenbosch, & Antony, 2012). Panic disorder may last for years, during which periods of improvement may be followed by recurrence. As many as 30 percent of the U.S. population have experienced at least one panic attack within the past year, but full-blown panic disorder is seen in only about 2 to 3 percent of the population in any given year (Hollander & Simeon, 2008; Kessler, Chiu et al., 2006; NIMH, 2014).

OBSESSIVE-COMPULSIVE AND RELATED DISORDERS

What are obsessive rituals?

Obsessive-compulsive disorder (OCD) affects about 1 percent of the U.S. population in any given year and about 2 to 3 percent of the world population at some time in their lives (Worden & Tolin, 2014; NIMH, 2014). People displaying OCD are plagued by persistent, upsetting, and unwanted thoughts—called **obsessions**—that often focus on the possibility of infection, contamination, or doing harm to themselves or others. They don't actually carry out harmful acts, but the obsessive thoughts motivate repetitive behaviors—called **compulsions**—that the person believes will prevent infection, aggressive acts, or other events associated with the obsessions (Noyes & Hoehn-Saric, 2006). Common compulsions include rituals such as checking locks; repeating words or numbers; counting things; or arranging objects “just so.” Obsessions and compulsions are much more intense than the familiar experience of having a thought or tune running “in the back of your mind” or rechecking a door to see that it is locked. In OCD, the obsessions and compulsions are intense, disturbing, and often strange intrusions that can severely impair daily activities (Morillo, Belloch, & Garcia-Soriano, 2007). Many of those who display OCD recognize that their thoughts and actions are irrational, but they still experience severe anxiety if they try to interrupt their obsessions or give up their compulsive rituals.

Other forms of obsessive-compulsive disorder can appear as obsessive preoccupation with the perceived infidelity of a partner (obsessional jealousy), extreme hoarding of possessions, persistent hair-pulling, nail- or lip-biting, and skin-picking. In another form of OCD called **body dysmorphic disorder**, the person is intensely distressed about an imagined abnormality of the skin, hair, face, or other bodily area. They may become preoccupied with the imagined deformity or imperfection, avoid social contacts, become dysfunctional, and even seek unnecessary corrective surgery (Hartmann et al., 2014; Veale, 2009).



A Cleaning Compulsion

Obsessive-compulsive disorder is diagnosed when a culturally expected degree of cleanliness turns into an obsessive preoccupation with germs and a life-disrupting compulsion to clean things. Learning and stress appear to play the major role in shaping and triggering this and other obsessive-compulsive disorders, but biological factors, including genetically inherited characteristics and problems in certain neurotransmitter systems, may result in an oversensitive nervous system and a predisposition toward anxiety.

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Causes of Anxiety and Obsessive-Compulsive Disorders

As with all the forms of psychopathology we will consider, the exact causes of anxiety disorders are a matter of some debate. However, there is good evidence that biological, psychological, and social factors all contribute (Coelho & Purkis, 2009; McKay & Storch, 2014). The exact nature and combination of causal factors varies from one anxiety disorder to the next. For example, the brain regions involved in panic disorder are not identical to those involved in social or other forms of anxiety disorder (Young, Wu, & Menon, 2012; Zhou et al., 2010), and the learning experiences that contribute to specific phobias may differ from those that contribute to agoraphobia.

Biological Factors

Most anxiety and obsessive-compulsive disorders appear to run in families, suggesting that these disorders are influenced by genes (Taylor, 2014). This influence is seen in the fact that if one identical twin has an anxiety disorder, the other twin (who shares the same genes) is also more likely to have an anxiety disorder than is the case in nonidentical twin pairs (Taylor, 2014). Some inherited predispositions may be rather specific. One study found that identical twins are more likely than other siblings to share phobias about small animals and social situations but not about heights or enclosed spaces (Skre et al., 2000). The degree of genetic influence on anxiety disorders is moderate, however (Hollander & Simeon, 2008), and varies among disorders. For instance, genes may play a stronger role in early-onset panic disorder and generalized anxiety disorder than in specific phobias (Bolton et al., 2006; Distel et al., 2008).

Many researchers are trying to identify the specific genes or gene combinations involved in anxiety and obsessive-compulsive disorders. For example, a number of genes have been suggested as contributing to OCD, including two variations of the *SLC6A4* gene (Saiz et al., 2008). This work is difficult, though, because the mere presence of a gene doesn't necessarily predict the appearance of a disorder. Rather, genes are often "switched on" or "switched off" by environmental triggers (Uddin et al., 2010). The genes or gene combinations that may be involved in anxiety disorders may exert their influence through their effects on the brain's neurotransmitter systems. For instance, excessive activity of norepinephrine circuits in certain parts of the brain has been linked with panic disorder, and dysregulation of serotonin has been associated with obsessive-compulsive disorder and social anxiety disorder (Lanzenberger et al., 2007). The role of these neurotransmitters is also suggested by the fact that medications that affect them are often effective in the treatment of OCD and various anxiety disorders (Bartz & Hollander, 2006).

Psychological and Environmental Factors

Biological predispositions combine with environmental stressors and psychological factors—especially cognitive processes and learning—to cause most anxiety and obsessive-compulsive disorders (e.g., Hudson & Rapee, 2009; Leppänen & Nelson, 2012; Nugent et al., 2011). Abuse or other stressful experiences in childhood are also associated with increased risk of developing an anxiety disorder, particularly panic disorder (Brook & Schmidt, 2008; Safren et al., 2002). The effects of abuse, natural disasters, war, terrorist attacks, and other extreme environmental stressors can also be seen in the appearance of *trauma- and stressor-related disorders* such as posttraumatic stress disorder (American Psychiatric Association, 2013). The impact of learning on anxiety disorders can be seen in families in which parents don't socialize much, tend to be suspicious of others, and exaggerate life's everyday dangers. These parents might unwittingly promote social anxiety in their children—especially in those with a tendency toward shyness or anxiety (Eley et al., 2010)—by being overly protective and controlling, and thus influencing them to interpret social situations as threatening (Essex et al., 2010).

Learned ways of thinking play their part, too. Many people suffering from anxiety disorders exaggerate dangers in their environment, thereby creating an unrealistic expectation that bad things are going to happen (Cisler & Koster, 2010; Lissek et al., 2014).

This expectation leads them to dwell on and be constantly on the lookout for negative events. In addition, they tend to underestimate their own capacity for dealing with threatening events, thus triggering anxiety and desperation when feared events do occur (Beck & Emery, 1985). Their lack of perceived control, in turn, can lead these people to avoid or overreact to threatening situations. Consider how panic attacks develop. They may seem to come out of nowhere, but in fact subtle symptoms of physical arousal may set the stage (Meuret et al., 2011). It is the person's sensitivity to and cognitive interpretation of those symptoms that can make an attack actually develop (Domschke et al., 2010). In fact, experiments have shown that panic attacks are less likely in panic disorder patients who believe they can control the source of their discomfort (Koerner et al., 2012). These and other research results suggest that cognitive factors play an important role in panic disorder as well as in specific phobias, social anxiety disorder, generalized anxiety disorder, and OCD.

LINKAGES Can we learn to become "abnormal"? (a link to Learning)

LINKAGES

ANXIETY AND OBSESSIVE-COMPULSIVE DISORDERS AND LEARNING

Money troubles, illness, final exams, unhappy relationships, and other problems can create worry and anxiety, especially for people who are under stress from other sources or feel incapable of dealing with their problems. As upsetting thoughts about these problems become more persistent, anxiety increases. If doing something such as cleaning the kitchen temporarily relieves the anxiety, that action may be strengthened through the process of negative reinforcement (see the chapter on learning). But cleaning can't eliminate the obsessive thoughts, so when they return, the cleaning may begin again. Eventually, cleaning or other actions may become compulsive, endlessly repeated rituals that keep the person trapped in a vicious circle of anxiety (Worden & Tolin, 2014). Based on this kind of analysis, social-cognitive theorists see obsessive-compulsive disorder as a learned pattern sparked by distressing thoughts and maintained by operant conditioning (Abramowitz et al., 2006).

They also see phobias as partly due to learning, especially to classical conditioning and observational learning. The object of the phobia becomes a conditioned aversive stimulus through association with a traumatic event that acts as an unconditioned stimulus (Olatunji, 2006; Stein, 2006). Fear of dogs, for example, may result from a dog attack. Observing or hearing about other people's bad experiences can produce the same result: most people who fear flying have never been in a plane crash. Fears can even develop after seeing scary movies or TV shows (Askew, Kessock-Philip, & Field, 2008). Once the fear is learned, avoidance of the feared object or situation prevents the person from finding out that the fear is exaggerated. This cycle of avoidance helps explain why many fears don't disappear on their own (Lovibond et al., 2009).

Biological Preparedness

TRY THIS Being predisposed to learn to fear snakes and other potentially dangerous stimuli makes evolutionary sense. Like other animals, humans who rapidly learn a fear response to objects or situations that they see frightening their parents or peers are more likely to survive to pass on their genes to the next generation. Are there things you are especially afraid of? If so, list them and make a note of how you think these fears developed. How many of them appear to have "survival value"?

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(continued)

Why are phobias involving snakes and spiders so common, even though people are seldom harmed by them? And why are there so few cases of phobias about electrical shocks, even though lots of people receive accidental shocks? The answer may be that people are *biologically prepared* to learn to fear and avoid things that had the potential to harm their evolutionary ancestors. This idea is supported by laboratory research (Hamm, Vaitl, & Lang, 1989). In one study, a group of Swedish psychologists created conditioned fear reactions to certain stimuli by associating photographs of those stimuli with electrical shocks (Öhman, Dimberg, & Öst, 1985). Their volunteer participants developed approximately equal conditioned anxiety reactions to photos of houses, human faces, and snakes. Later, however, when the participants were shown the photos alone, their conditioned reaction to snakes remained long after their response to houses and faces had faded. Similar results have also occurred in experiments with monkeys (Mühlberger et al., 2006; Zinbarg & Mineka, 1991). If a monkey sees another monkey behaving fearfully in the presence of a snake, it quickly develops a strong and persistent fear of snakes. However, if the snake is entwined in flowers, the observer monkeys come to fear only the snake, not the flowers. So the fear conditioning appears to be selective, focusing only on potentially dangerous creatures such as snakes or crocodiles (Mühlberger et al., 2006; Zinbarg & Mineka, 1991) and not on harmless objects.

Learning is obviously important in the development of fear, but learning principles alone cannot explain why exposure to certain stimuli causes anxiety disorders in some people and not in others (Field, 2006). Why is it, for example, that some survivors of the 9/11 terrorist attacks developed phobias (or posttraumatic stress disorder) and others did not? As suggested by the diathesis-stress approach, the impact of people's experiences is heightened or dampened by other factors, such as their genetic and biological vulnerability or resilience to stress, their previous experiences with frightening events, their expectations and other cognitive habits, and the social support and other conditions that follow the trauma (Bryant et al., 2010; Leyro, Zvolensky, & Bernstein, 2010; Mineka & Zinbarg, 2006; Nugent et al., 2011). In short, learning—including the learning that supports the development of anxiety and obsessive-compulsive disorders—occurs more quickly among those who are biologically and psychologically prepared for it.

SOMATIC SYMPTOM AND RELATED DISORDERS

Can mental disorder cause blindness?

A young athlete was suffering fainting spells that prevented her from competing in track and field events. Doctors found no physical problems, and it was only after a program of stress management that her symptoms disappeared and she was able to rejoin her team (Lively, 2001). Sometimes people show symptoms of a *somatic*, or bodily, disorder even though there is nothing physically wrong to cause the symptoms. When psychological problems take somatic form, they are called **somatic symptom disorders**.

One type of somatic symptom disorder called **illness anxiety disorder** (once known as *hypochondriasis*) involves a strong, unjustified fear that one has or might get cancer, heart disease, AIDS, or some other serious medical problem. This fear prompts people with illness anxiety disorder to make frequent visits to doctors, where they report numerous symptoms. Their preoccupation with illness often leads these people to become “experts” on their most feared diseases, sometimes by endlessly searching health-related websites (Taylor & Asmundson, 2008). Other people whose disorders fall in this category make dramatic but vague reports about a multitude of physical problems; some may complain of severe, often constant pain (typically in the neck, chest, or back) all with no obvious physical cause. The classic example of disorders in this category is **conversion disorder**, a condition in which a person appears to be (but is not) blind, deaf, paralyzed, or insensitive to pain in various parts of the body. (An older term for this disorder was *hysteria*.) Conversion disorders are rare; less than 1 percent of adults experience them, and they are more common in women than men (American Psychiatric Association, 2013; Feinstein, 2011). Although they can occur at any point in life, conversion disorders usually appear in adolescents or young adults.

somatic symptom disorders Psychological problems in which a person shows the symptoms of a physical disorder for which there is no physical cause.

illness anxiety disorder A strong, unjustified fear of physical illness.

conversion disorder A somatic symptom disorder in which a person appears to be (but actually is not) blind, deaf, paralyzed, or insensitive to pain.

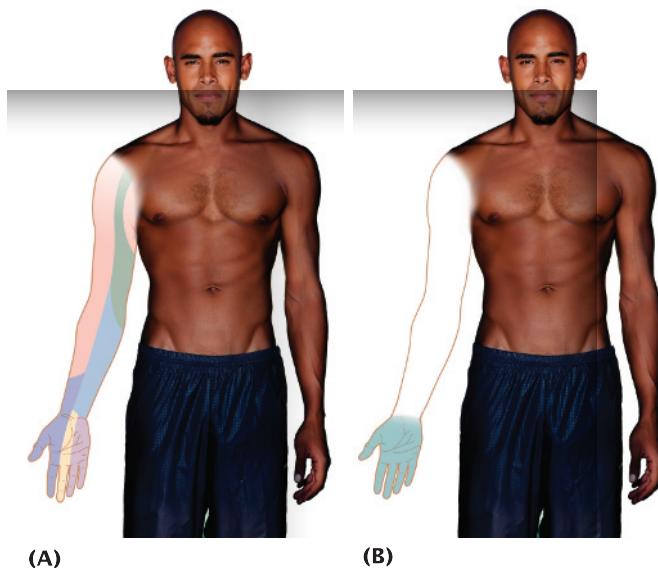


FIGURE 14.3
Glove Anesthesia

In a form of conversion disorder called *glove anesthesia*, lack of feeling stops abruptly at the wrist (Part B). But as indicated by the overlapping colors in Part A, the nerves of the hand and arm blend, so if they were actually impaired, part of the arm would also lose sensitivity. Other neurologically impossible symptoms of conversion disorder include sleepwalking at night on legs that are "paralyzed" during the day.

Dylan Ellis/The Image Bank/Getty Images

Conversion disorders differ from true physical disabilities in several ways. First, they tend to appear when a person is under severe stress. Second, they often help reduce that stress by allowing the person to avoid unpleasant situations. Third, the symptoms may be neurologically impossible or improbable, as Figure 14.3 illustrates. Finally, the person may show surprisingly little concern about what most people would think was a rather serious problem. One college student, for example, experienced visual impairment that began each Sunday evening and became total blindness by Monday morning. Her vision would begin to return on Friday evenings and was fully restored in time for weekend social activities. She expressed no particular concern over her condition (Holmes, 1991).

Can people who display a conversion disorder actually see, hear, or move, even though they act as if they cannot? Observations and experiments suggest that they can. Supposedly paralyzed people have been seen to sleepwalk, and supposedly blind or deaf people make use of sights and sounds to guide their behavior (e.g., Blake, 1998; Grosz & Zimmerman, 1970). But this does not mean that they are consciously faking. In fact, conversion disorder is diagnosed only when the symptoms are *not* being faked. Rather than destroying sensory or motor ability, the conversion process may prevent the person from being aware of information that the brain is processing (Bryant & Das, 2012).

Biological, psychological, and social factors have all been suggested as contributing to somatic symptom disorders. Some cases, for example, may be related to childhood experiences in which a person learns that symptoms of physical illness bring special attention and care (Abramowitz & Braddock, 2006; Feinstein, 2011). Others, including conversion disorder, may be triggered by severe stressors (Ovsiew, 2006). Cognitive factors come into play, too. When given information about their health, people who display illness anxiety disorder are strongly biased to focus on threat-confirming information but to ignore reassuring information (Eifert, Zvolensky, & Louis, 2008). Abnormal serotonin functioning has also been associated with illness anxiety disorder, and various combinations of neurochemical and social skill deficits appear to accompany conversion disorder and body dysmorphic disorder (Eifert, Zvolensky, & Louis, 2008).

Based on such findings, many researchers have adopted a diathesis-stress approach to explaining somatic symptom disorders. The results of their work suggest that certain people may have biological and psychological traits that make them especially vulnerable to these disorders, particularly when combined with a history of physical illness (Suls & Howren, 2012). Among these traits are self-consciousness and oversensitivity to physical sensations. If such people experience a number of long-lasting stressors, intense emotional conflicts, or severe traumas, they are more likely than others to display physical symptoms in association with negative emotional arousal (Abramowitz & Braddock, 2006; Siti, 2004).

Sociocultural factors may also shape somatic symptom disorders. In some Asian, Latin American, and African cultures, it is common for people to experience severe headaches and other physical symptoms in association with psychological or interpersonal conflicts (Weiss et al., 2009). In North America such conflicts are more likely to be accompanied by anxiety or depression (Brislin, 1993). Genetic factors appear to play only a minor role in somatic symptom disorders.

DISSOCIATIVE DISORDERS

What disorders create sudden memory loss?

Have you ever been driving all day on a boring highway and suddenly realized that you had almost no memory of what happened during the past half-hour? This common experience does not signal a mental disorder, but when disruptions in a person's

memory, consciousness, or identity are more intense and long lasting, they are known as **dissociative disorders**. These disruptions can come on gradually, but they usually occur suddenly and last from a few hours to many years. Consider the case of eighteen-year-old “Jane Doe,” who was found lying in the fetal position outside a New York City youth shelter in October 2009. She claimed to have no memory of her name, where she came from, or how she got where she was (Moore, 2009). After her picture was shown on national television, a viewer identified her as Kacie Peterson.

Kacie displayed a severe form of a disorder known as a **dissociative amnesia**, which is characterized by sudden loss of memory for (or confusion about) personal identity. In some cases, the person adopts an entirely new identity. Other forms of dissociative amnesia also involve sudden loss of memory about personal information but the person does not leave home or create a new identity. These conditions are rare, but they tend to attract intense publicity because they are so dramatic.

The most famous dissociative disorder is **dissociative identity disorder (DID)**, known in earlier editions of the DSM (and still commonly called) *multiple personality disorder (MPD)*. A person with DID appears to have more than one identity, each of which speaks and acts in a different way. Each personality seems to have its own memories, wishes, and (often conflicting) impulses. Here is a case example:

Mary, a pleasant and introverted 35-year-old social worker, was referred to a psychiatrist for hypnotic treatment of chronic pain. At an early interview she mentioned the odd fact that though she had no memory of using her car after coming home from work, she often found that it had been driven 50 to 100 miles overnight. It turned out that she also had no memory of large parts of her childhood. Mary rapidly learned self-hypnosis for pain control, but during one hypnotic session, she suddenly began speaking in a hostile manner. She told the doctor her name was Marian and that it was “she” who had been taking long evening drives. She also called Mary “pathetic” for “wasting time” trying to please other people. Eventually, six other identities emerged, some of whom told of having experienced parental abuse in childhood. (Spitzer et al., 1994)

During the 1970s, there was a minor “epidemic” of DID, as well as an increase in the number of alternative personalities per case; some patients reported over forty of them (Castelli, 2009). This upsurge in DID may have occurred because clinicians were looking for it more carefully or because the conditions leading to it became more prevalent, but it may have also been influenced by movies such as *Sybil* and by tell-all books written by people who had been diagnosed with DID (Kihlstrom, 2005). These media influences may have increased the status of DID as a socioculturally approved method of expressing distress (Hacking, 1995).

dissociative disorders Conditions involving sudden and usually temporary disruptions in a person's memory, consciousness, or identity.

dissociative amnesia A psychological disorder marked by a sudden loss of memory for one's own name, occupation, or other identifying information.

dissociative identity disorder (DID) A dissociative disorder in which a person appears to have more than one identity, each of which behaves in a different way.

There is a great deal of controversy over how dissociative disorders develop (Boysen & Van Bergen, 2014). Psychodynamic theorists see massive repression of traumatic events as the basis for creating “new personalities” who act out otherwise unacceptable impulses or recall otherwise unbearable memories (Maldonado & Spiegel, 2008; Ross, 1997). Social-cognitive theorists focus on the fact that everyone is capable of behaving in different ways depending on the circumstances (e.g., rowdy in a bar, quiet in a museum). In rare cases, they say, this variation can become so extreme that a person feels like and is perceived by others as a “different person.” Further, sudden memory loss or unusual behavior may be rewarded if they allow a person to escape unpleasant situations, responsibilities, or punishment for misbehavior (Lilienfeld & Lynn, 2003; Lilienfeld et al., 2009). Among other possible contributing factors are habitual errors in thinking and memory, difficulties in controlling attention, and problems in the daily sleep-wake cycle (Lynn et al., 2012; vander Kloet et al., 2012).

Research available so far suggests four conclusions. First, memory loss and other forms of dissociation are real phenomena that can be extreme. Second, many people displaying DID have experienced events they want to forget or avoid. Most (some clinicians



By dropping the label *multiple personality disorder*, the DSM downplayed the idea that some people harbor multiple personalities that can easily be “contacted” through hypnosis or drugs. The new label, *dissociative identity disorder*, suggests instead that a dissociation, or separation, between one’s memories and other aspects of identity can be so dramatic that people experiencing it may come to believe that they have more than one personality.

Leo Cullum/The New Yorker Collection/Cartoonbank

believe all) have suffered severe, unavoidable, persistent abuse in childhood (Foote et al., 2006; Kihlstrom, 2005). Third, like Mary, most affected people appear to be skilled at self-hypnosis, through which they can induce a trance-like dissociative state. Fourth, most found that they could escape the trauma of abuse (at least temporarily) by creating “new personalities” to deal with stress (Spiegel, 1994; van der Hart et al., 2005).

However, not all abused children display DID, and some cases of DID may indeed be triggered by media stories or by therapists who expect to see alternative personalities and use hypnosis and other methods that encourage clients to display them (McHugh, 2009; Rieber, 2006). For example, it now appears that “Sybil’s” famous story about having sixteen personalities was untrue (Nathan, 2011). This evidence has led some skeptics to question the very existence of multiple personalities (Lynn et al., 2012). They point to research showing, for example, that people who display DID may be more aware than they think they are of the memories and actions of each apparent identity (Allen, 2002; Allen & Iacono, 2001; Canaris, 2008). Even those who argue for the existence of DID concede that it is quite rare (American Psychiatric Association, 2013).

Research on the existence and effects of repressed memories (discussed in the memory chapter) is sure to have an impact on our understanding of (and the controversy over) the causes of DID. (“In Review: Anxiety, Obsessive-Compulsive, Somatic Symptom, and Dissociative Disorders” presents a summary of our discussion of these topics.)

IN REVIEW

ANXIETY, OBSESSIVE-COMPULSIVE, SOMATIC SYMPTOM, AND DISSOCIATIVE DISORDERS

Disorder	Subtypes	Major Symptoms
Anxiety Disorders	Specific Phobias	Intense, unreasonable, and disruptive fear of objects or situations.
	Generalized Anxiety Disorder	Excessive anxiety not focused on a specific situation or object; free-floating anxiety.
	Panic Disorder	Repeated attacks of intense fear involving physical symptoms such as faintness, dizziness, and nausea.
Obsessive-Compulsive and Related Disorders	Obsessive-Compulsive Disorder	Persistent ideas or worries accompanied by ritualistic behaviors performed to neutralize anxiety-driven thoughts.
	Body Dysmorphic Disorder	Rituals of thought and action associated with perceived bodily flaws.
Somatic Symptom and Related Disorders	Hoarding Disorder	Problematic retention of possessions caused by a perceived need to save them and distress associated with discarding them.
	Conversion Disorder	A loss of physical ability (e.g., vision, hearing) that is related to psychological factors.
	Illness Anxiety Disorder	Preoccupation with or belief that one has a serious illness in the absence of any physical evidence.

(continued)

ANXIETY, OBSESSIVE-COMPULSIVE, SOMATIC SYMPTOM, AND DISSOCIATIVE DISORDERS (CONT.)

Disorder	Subtypes	Major Symptoms
Dissociative Disorders	Dissociative Amnesia	Sudden loss of memory.
	Dissociative Identity Disorder (Multiple Personality Disorder)	Appearance within the same person of two or more distinct identities, each with a unique way of thinking and behaving.

In Review Questions

- Concern that it may be triggered by media stories or therapists' suggestions has made _____ the most controversial of the dissociative disorders.
- A person who sleepwalks but is not able to walk when awake is showing signs of _____.
- Panic disorder is sometimes associated with another anxiety disorder called _____.

DEPRESSIVE AND BIPOLAR DISORDERS

How common is depression?

Everyone's mood, or *affect*, tends to rise and fall from time to time. However, when people experience long periods of extreme moods such as wild elation or deep depression, when they shift from one extreme to another, and especially when their moods are not consistent with the events around them, they are said to show **depressive disorders** (sometimes also called *mood disorders* or *affective disorders*) or *bipolar disorders*.

Depressive Disorders

Depression can range from occasional, normal "down" periods to episodes severe enough to require hospitalization. A person suffering **major depressive disorder** feels sad and overwhelmed, typically losing interest in activities and relationships and taking pleasure in nothing (American Psychiatric Association, 2013). Despite the person's best efforts, anything from conversation to bathing can become an unbearable, exhausting task. Changes in eating habits resulting in weight loss or weight gain often accompany major depression. There may also be disturbed sleeping or excessive sleeping. Problems in working, concentrating, making decisions, and thinking clearly are also common, as are symptoms of an accompanying anxiety disorder or physical illness (Cuijpers et al., 2012; Suls, & Howren, 2012). In extreme cases, depressed people may express false beliefs, or **delusions**, worrying, for example, that government agents are planning to punish them. Major depression may come on suddenly or gradually. It may consist of a single episode, or of repeated periods of depression (Klein, 2010). These episodes can last weeks or months; the average length of the first episode is four to nine months (Durand & Barlow, 2006). Exaggerated feelings of inadequacy, worthlessness, hopelessness, or guilt are common in major depression (Klein, 2010). Here is a case example:

Mr. J. was a fifty-one-year-old industrial engineer.... Since the death of his wife five years earlier, he had been suffering from continuing episodes of depression marked by extreme social withdrawal and occasional thoughts of suicide.... He drank, and when thoroughly intoxicated would plead to his deceased wife for forgiveness. He lost all capacity for joy.... Once a gourmet, he now had no interest in food... and could barely

depressive disorders Conditions in which a person experiences extremes of moods for long periods, shifts from one extreme mood to another, and experiences moods that are inconsistent with events.

major depressive disorder A condition in which a person feels sad and hopeless for weeks or months, often losing interest in all activities and taking pleasure in nothing.

delusions False beliefs, such as those experienced by people suffering from schizophrenia or severe depression.

manage to engage in small talk. As might be expected, his work record deteriorated markedly. Appointments were missed and projects haphazardly started and left unfinished. (Davison & Neale, 1990, p. 221)

In other cases, the depth of depression is not so extreme (de Graaf et al., 2010). In a less severe pattern of depression called **persistent depressive disorder**, the person shows the sad mood, lack of interest, and loss of pleasure associated with major depressive disorder but less intensely and for a longer period. Mental and behavioral disruptions are also less severe.

Depressive disorders occur at some time in the lives of about 17 percent of people in North America and Europe; in any given year, about 7 percent of these populations are experiencing them (American Psychiatric Association, 2013; Cuijpers et al., 2012). Unfortunately, depression is becoming more common, both in the United States and elsewhere. The World Health Organization estimates that if current trends continue, depression will become the second leading cause of disability and premature death in developed countries (Kessler, 2012; World Health Organization, 2012). The incidence of these disorders varies considerably across cultures and subcultures, however. For example, they occur at much higher rates in urban Ireland than in urban Spain, or in China (Judd et al., 2002; Lee et al., 2007), and at higher rates in countries with the highest average incomes (Kessler, 2012). There are gender differences in some cultures, too. In North America and Europe, women are two to three times more likely than men to experience major depressive disorder (Kessler & Wang, 2008), but this difference does not appear in the less economically developed countries of the Middle East, Africa, and Asia (Ayuso-Mateos et al., 2001; World Health Organization, 2003). Depression can occur at any age, but it peaks in late adolescence or young adulthood and again in old age (American Psychiatric Association, 2013).

Depression often occurs in combination with other psychological disorders and medical conditions; it is especially likely to be diagnosed along with posttraumatic stress disorder, obsessive-compulsive disorder, and various anxiety disorders, as well as with substance-related and addictive disorders, physical disabilities, and obesity, and during recovery from heart attack (e.g., Rosen-Reynoso et al., 2011).

Suicide and Depression

Suicide is associated with a variety of psychological disorders, but it is most closely tied to depressive disorders (Balázs et al., 2006; Holma et al., 2010). In fact, thinking about suicide is a symptom of depressive disorders. When suicidal thoughts combine with hopelessness about the future, which is another depressive symptom, a suicide attempt is much more likely to occur. Indeed, the rate of suicide among those with major depressive disorder is 3.4 percent overall, but 7 percent for males and as high as 15 percent for those who have been hospitalized for depression (Pompili et al., 2008; Van Orden et al., 2010).

In 2010, the year for which the most recent data are available, more than 38,000 people in the United States committed suicide, and over 1 million people attempted it (Centers for Disease Control and Prevention, 2014). Suicide was the tenth leading cause of death in the United States that year. Compared with the United States, the suicide rate is nearly twice as high in some northern and eastern European countries and Japan and only about half as high in countries with stronger religious prohibitions against suicide, such as Greece, Italy, Ireland, and the nations of the Middle East (Ono et al., 2008; World Health Organization, 2003).

Suicide rates differ considerably depending on sociocultural factors such as age, gender, and ethnicity. In the United States, suicide is most common among people sixty-five and older, especially males (Centers for Disease Control and Prevention, 2014; Warner, 2010). However, since 1950, suicide among adolescents has tripled. And though the rate has begun to level off in the last decade (Centers for Disease Control and Prevention, 2014), it is still the third leading cause of death, after accidents and homicides, among fifteen- to

persistent depressive disorder A pattern of depression in which the person shows the sad mood, lack of interest, and loss of pleasure associated with major depressive disorder but to a lesser degree and for a longer period.

twenty-four-year-olds (Centers for Disease Control and Prevention, 2014). Suicide is the second leading cause of death among college students; about 10,000 try to kill themselves each year and about 1,000 actually do so. These figures are much higher than for young people in general but much lower than for the elderly (NIMH, 2009). Women attempt suicide three times as often as men, but men are four times as likely to actually kill themselves (Centers for Disease Control and Prevention, 2014). The gender difference is even greater among people who have been diagnosed with depressive disorders. In this group, the male suicide rate of 65 per 100,000 is ten times higher than the rate for women (Blair-West et al., 1999; Centers for Disease Control and Prevention, 1999b). The suicide rate for men who are eighty-five or older is 55 per 100,000, which is more than ten times higher than for women in this age group (Centers for Disease Control and Prevention, 2004).

Suicide rates also differ across ethnic groups. Among males in the United States, for example, the overall rate for American Indians is 15.1 per 100,000, compared with 13.9 for European Americans, 5.7 for Asian Americans, 4.9 for Hispanic Americans, and 5.0 for African Americans. The same pattern of ethnic differences appears among women, though the actual rates are much lower (NIMH, 2009).

Predicting who will commit suicide is difficult. For one thing, suicidal thoughts are common. About 3 percent of all adults and as many as 10 percent of college students report having had such thoughts during the past year (Dawe, 2008; Kessler, Berglund, Borges et al., 2005). Still, hundreds of research studies provide some predictive guidelines (Liu & Miller, 2014; Smyth & MacLachian, 2005). In the United States, at least, suicide is most likely among European American males, especially those who are older than forty-five, single or divorced, and living alone. Extended unemployment increases the suicide risk for this group (Joska & Stein, 2008; Inoue et al., 2006). The risk is also heightened among people diagnosed with a mood disorder, anxiety disorder, or schizophrenia (e.g., Khan et al., 2002; Rihmer, 2001). Among the elderly, suicide is most common in males who suffer depression over health problems (e.g., Brown, Bongar, & Cleary, 2004). The risk is higher, too, in people who have made a specific plan, given away possessions, and are impulsive (Centers for Disease Control and Prevention, 2004; Kohli et al., 2010). Certain genetic risk factors combined with a history of child abuse may further increase the likelihood of a suicide attempt (Murphy et al., 2011). A previous suicide attempt may not always be a good predictor of eventual suicide, because such attempts may have been help-seeking gestures, not failed efforts to die (Nock & Kessler, 2006). In fact, although about 10 percent of unsuccessful attempters try again and succeed, most people who commit suicide had made no prior attempts (Clark & Fawcett, 1992).

You may have heard that people who talk about suicide will never try it. This is a myth (Shneidman, 1987). In fact, those who say they are thinking of suicide are much more likely than other people to attempt suicide. Most suicides are preceded by some kind of warning, whether direct ("I think I'm going to kill myself") or vague ("Sometimes I wonder if life is worth living"). Failure to recognize or respond to warning signs is common, even among psychologists (Fowler, 2012; Valuck et al., 2007). So although not everyone who threatens suicide follows through, if you suspect that someone you know is thinking about suicide, encourage the person to contact a mental health professional or a crisis hotline. If the danger is immediate, make the contact yourself and ask for advice about how to respond. Many suicide attempts—including those triggered by other suicides in the same town or school—can be prevented by social support and other forms of help for people at high risk (Centers for Disease Control and Prevention, 2014; Mann et al., 2005). For more information, visit suicide-related websites, such as that of the American Association of Suicidology.

bipolar disorders Conditions in which a person alternates between the two emotional extremes of depression and mania.

mania An elated, active emotional state.

Bipolar Disorders

The alternating appearance of two emotional extremes, or poles, characterizes **bipolar disorders**. In these disorders, episodes of depression alternate with **mania**, which is an extremely agitated and usually elated emotional state. During periods of mania, people tend to be overly optimistic, boundlessly energetic, certain of having extraordinary

powers and abilities, and bursting with all sorts of ideas. They are irritated by anyone who tries to reason with them or “slow them down,” and they may make impulsive and unwise decisions, including spending their life savings on foolish schemes; they can even become a danger to themselves or to others (Goldberg & Burdick, 2008; Ketter, 2010).

There are two versions of bipolar disorder, known as bipolar I and bipolar II. In *bipolar I disorder*, episodes of mania may alternate with periods of depression (Ghaemi, 2008). Sometimes periods of relatively normal mood separate these extremes (Tohen et al., 2003). This pattern has also been called *manic depression*. Compared with major depressive disorder, bipolar disorder is less common. It occurs in only about 1 percent of adults, and it affects men and women about equally. Another 1 percent of adults display *bipolar II disorder*, in which major depressive episodes alternate with episodes known as *hypomania*, which are less severe than the manic phases seen in bipolar I disorder (Merikangas et al., 2007). Either version can severely disrupt a person’s ability to work or manage social relationships (American Psychiatric Association, 2013). Slightly more common is a pattern of milder mood swings known as **cyclothymic disorder**. Like depressive disorders, bipolar disorders are extremely disruptive to a person’s ability to work or maintain social relationships, and they are often accompanied by anxiety disorders or substance abuse (Andreescu et al., 2007; Ghaemi, 2008). “In Review: Depressive and Bipolar Disorders” summarizes the main types of disorders affecting mood and activity.

IN REVIEW

DEPRESSIVE AND BIPOLAR DISORDERS

Type	Typical Symptoms	Related Features
Major Depressive Disorder	Deep sadness, feelings of worthlessness, changes in eating and sleeping habits, loss of interest and pleasure.	Lasts weeks or months; may occur in repeating episodes; severe cases may include delusions.
Persistent Depressive Disorder	Similar to major depression but less severe and longer lasting.	Hospitalization usually not necessary.
Bipolar Disorder	Alternating extremes of mood from deep depression to mania and back.	Manic episodes include impulsivity, unrealistic optimism, high energy, severe agitation.
Cyclothymic Disorder	Similar to bipolar disorder but less severe.	Hospitalization usually not necessary.

In Review Questions

- The risk of suicide is associated with _____ more than with any other disorder.
- Cyclothymic disorder is a less severe version of _____.
- Women are _____ likely than men to try suicide, but men are _____ likely to succeed.

LINKAGES Are some psychological disorders inherited? (a link to Biological Aspects of Psychology)

Causes of Depressive and Bipolar Disorders

Research on the causes of depressive and bipolar disorders has focused on biological, psychological, and sociocultural risk factors. The more of these risk factors people have, the more likely they are to experience a depressive or bipolar disorder.

Biological Factors

Because some depressive disorders seem to run in families, it has long been suspected that genetic factors are involved in causing them (Gotlib, Joorman, & Foland-Ross, 2014). The role of genetics is suggested by the results of twin studies and family studies (Cuijpers

cyclothymic disorder A bipolar disorder characterized by an alternating pattern of mood swings that is less extreme than that of bipolar I or II disorder.

et al., 2012; Fullerton et al., 2010). For example, bipolar disorder is much more likely to be seen in both members of genetically identical twin pairs than in nonidentical twins (Smoller, 2008). Family studies also show that those who are closely related to people with bipolar disorder are more likely than others to develop the disorder themselves (Althoff et al., 2005; Serretti et al., 2009). Major depressive disorder, too, is more likely to occur in both members of identical twins than in both members of nonidentical twins (Kendler et al., 2009; Levinson, 2006). Findings such as these suggest that genetic influences tend to be stronger for depressive and bipolar disorders (especially for bipolar I disorder and severe, early-onset depression) than for most other disorders.

Researchers have identified certain genetic variations that affect vulnerability to depressive and bipolar disorders. These include genes on chromosome 13 that are involved in the operation of the neurotransmitter serotonin (Hariri et al., 2005; Jacobs et al., 2006; Wilhelm et al., 2006). But genetic variations alone do not cause depressive and bipolar disorders. Rather, genes appear to act along with other biological, psychological, and environmental factors. For example, a version of the serotonin transporter gene appears to increase the likelihood that high amounts of stress will trigger depression (Caspi et al., 2010). Researchers in the field of epigenetics are investigating how genes associated with depressive and bipolar disorders can be “turned on” or “turned off” by environmental factors (Butcher, Mineka, & Hooley, 2010; Levinson et al., 2007).

Other biological factors that may contribute to these disorders include dysfunction of brain regions that are involved in mood, problems with the activity of certain brain neurotransmitter systems, changes in the endocrine system, disruption of biological rhythms, and altered development in brain areas such as the frontal lobes and hippocampus (e.g., Alloy et al., 2011; Butcher et al., 2010; Nurnberger et al., 2014). All of these conditions may themselves be influenced by genetics (Caspi et al., 2010).

Many brain regions are involved in mood, including the prefrontal cortex, the hippocampus, the amygdala, and other parts of the limbic system (Blumberg et al., 2003; MacQueen et al., 2003). How these regions are involved in depressive and bipolar disorders is not yet clear (e.g., Singh et al., 2013), but some researchers expect that particular disorders will eventually be shown to reflect problems in particular brain regions (Busatto, 2013; Savitz, Price, & Drevets, 2014). Some of the same brain regions, and many of the same genes, may also be involved in anxiety disorders, which may explain why depressive and anxiety disorders often occur together (Middeldorp et al., 2005; Vialou et al., 2014).

A role for the neurotransmitters norepinephrine, serotonin, and dopamine in depressive and bipolar disorders was suggested decades ago, when scientists discovered that drugs capable of altering these substances also relieved these disorders. However, the precise nature of the relationship between neurotransmitters and depression, for example, is still not fully understood. So despite what drug companies’ advertisements might suggest, no one really knows exactly what “chemical imbalance” exists in the brains of depressed people (Sharp & Cowen, 2011).

Depressive disorders have also been related to malfunctions of the endocrine system, especially the subsystem involved in the body’s responses to stress. For example, research shows that as many as 70 percent of depressed people secrete abnormally high levels of the stress hormone cortisol (Dinan, 2001; Posener et al., 2000). Studies of identical twins also suggest that higher levels of cortisol are associated with depression (Dinan, 2001; Wichers et al., 2008). Another hormone, oxytocin, is higher in individuals with depression and bipolar disorder, though the significance of this finding is not yet clear (Turan et al., 2013).

The cycles of mood swings seen in bipolar disorders and in recurring episodes of major depressive disorder suggest that these disorders may be related to stressful triggering events (Hammen, 2005; Keller & Nesse, 2006). They may also be related to disturbances in the body’s biological clock, which is described in the chapter on consciousness (Griesauer et al., 2014; Salgado-Delgado et al., 2011). This second possibility seems especially likely in the 15 percent of depressed people who consistently experience a calendar-linked pattern



Treating SAD

Seasonal affective disorder (SAD) can often be relieved by exposure to full-spectrum light for as little as a couple of hours a day (Terman & Terman, 2005).

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of depressive episodes known as *seasonal affective disorder* (SAD). During months of shorter daylight, these people slip into severe depression, accompanied by irritability and excessive sleeping (Durand & Barlow, 2006; Vyssoki et al., 2012). Their depression tends to lift as daylight hours lengthen (Faedda et al., 1993). Disruption of biological rhythms is also suggested by the fact that many depressed people tend to have trouble sleeping, partly because during the day their biological clocks may be telling them it is the middle of the night. Resetting the biological clock through methods such as sleep deprivation or light stimulation has relieved depression in many cases (Lavoie et al., 2009).

Psychological and Social Factors

Researchers have come to recognize that the biological factors involved in depressive and bipolar disorders always operate in combination with psychological and social factors (Cuijpers et al., 2012). As mentioned earlier, the very nature of depressive symptoms can depend on the culture in which a person lives. Biopsychosocial explanations for these disorders also emphasize the impact of social isolation, anxiety, and negative thinking; other psychological and emotional responses triggered by stressful events such as trauma; and the impact of cultural factors. For example, the higher rate of depression among females—especially poor ethnic-minority single mothers—has been attributed to their greater exposure to stressors of all kinds (Nolen-Hoeksema, 2006; Siddique et al., 2012). Environmental stressors affect men, too, which may be one reason that gender differences are smaller in countries in which men and women face equally stressful lives (Bierut et al., 1999).

A number of social-cognitive theories suggest that the way that people think about stressors affects the likelihood of depressive disorders. One such theory is based on the *learned helplessness* research described in the chapter on learning. Just as animals become inactive and appear depressed when they have no control over negative events (El Yacoubi et al., 2003), humans may experience depression as a result of feeling incapable of controlling their lives, especially stressors confronting them (Alloy et al., 2008; Seligman, 1991). But most of us have limited control, so why aren't we all depressed? The ways that people learn to think about events in their lives may hold the key. For example, Aaron Beck's cognitive theory of depression suggests that depressed people develop mental habits of (1) blaming themselves when things go wrong; (2) focusing on and exaggerating the negative side of events; and (3) jumping to overly generalized, pessimistic conclusions. Such cognitive habits, says Beck, are errors that lead to depressing thoughts and other depression symptoms (Beck, 2008). Depressed people, in fact, do tend to think about significant negative events in ways that are likely to increase or prolong depression (e.g., Gotlib et al., 2004; Morris, Ciesla & Garber, 2008).

Severe, long-lasting depression is especially likely among people who blame their lack of control or other problems on a permanent, generalized lack of personal competence rather than on a temporary condition or some external cause (Seligman et al., 1988). This *negative attributional style* may be another important cognitive factor in depression (Alloy et al., 2006; Ball et al., 2008). Are depressed people's unusually negative beliefs about themselves actually helping to cause their depression or are they merely symptoms of it? To answer this question, some studies have assessed the attributional styles of large samples of nondepressed people and then kept in touch with them to see whether individuals with negative self-beliefs are more likely to become depressed when stressors occur. These longitudinal studies suggest that a negative attributional style is, in fact, a risk factor for depression, not just a result of being depressed. In one study, for example, adolescents who held strong negative self-beliefs were more likely than other youngsters to develop depression when faced with stress later in life (Lewinsohn, Joiner, & Rohde, 2001).

Social-cognitive theorists also suggest that whether depression continues or worsens depends in part on how people respond once they start to feel depressed. People who continuously dwell on negative events, on why they occur, and even on being depressed are likely to feel more and more depressed (e.g., Just & Alloy, 1997; McMurrich & Johnson, 2008). Research by Susan Nolen-Hoeksema (2012; McLaughlin & Nolen-Hoeksema,

2011) suggests that this *ruminative style* is especially characteristic of women and may help explain gender differences in the frequency of depression. She found that when men start to feel sad, they tend to use a *distracting style*, engaging in activity that distracts them from their concerns and helps bring them out of their depressed mood (Nolen-Hoeksema, 2012).

Notice that social-cognitive explanations of depression are consistent with the diathesis-stress approach (Hankin & Abramson, 2001). These explanations suggest that certain cognitive styles serve as a predisposition (or diathesis) that makes a person vulnerable to depression, which is made even more likely by stressors. As suggested in the chapter on health, stress, and coping, the depressing effects of these stressors are likely to be magnified by lack of social support, inadequate coping skills, and the presence of other stressful conditions, such as poverty (e.g., Nikulina, Widom, & Czaja, 2011; Stice, Ragan, & Randall, 2004).

Given the number and complexity of biological, psychological, social, and situational factors potentially involved in causing depressive and bipolar disorders, the diathesis-stress approach appears to be an especially appropriate guide to future research (Kendler, Gardner, & Prescott, 2006). Indeed, some researchers are integrating the various factors into predictive and causal models. For instance, Kenneth Kendler and his colleagues have described specific sets of risk factors for depression in women that appear at five developmental stages, including childhood, early adolescence, late adolescence, adulthood, and in the year preceding the diagnosis of depression (Kendler, Gardner, & Prescott, 2006).

In the final analysis, it may turn out that each subtype of depressive and bipolar disorder is caused by a unique combination of factors. The challenge for researchers is to identify these subtypes and map out their causal ingredients (American Psychiatric Association, 2013; Eshel & Roiser, 2010).

SCHIZOPHRENIA SPECTRUM AND OTHER PSYCHOTIC DISORDERS

Is schizophrenia the same as “split personality”?

Schizophrenia (pronounced “skit-so-FREE-nee-ul”) is a pattern of severely disturbed thinking, emotion, perception, and behavior that seriously impairs the ability to communicate and relate to others, and disrupts most other aspects of daily life (Green & Horan, 2010; Hooley, 2010). It appears in a wide range, or spectrum, of severity, and its designation as *psychotic* reflects the fact that its various forms are among the most severe and disabling of all mental disorders. (*Psychosis* refers to conditions that leave people “out of touch with reality” or unable to function in society.)

Schizophrenia’s core symptoms are seen virtually everywhere in the world, though in less than 1 percent of the population (American Psychiatric Association, 2013). In the United States, it appears about equally in various ethnic groups, but like most disorders, it tends to be diagnosed more frequently in economically disadvantaged populations. It is seen about equally in men and women, although in women it may appear later in life, be less severe, and respond better to treatment (Aleman, Kahn, & Selten, 2003; American Psychiatric Association, 2013).

Schizophrenia tends to develop in adolescents or young adults. In about three out of four cases, symptoms start gradually over a few years; in other cases, the onset is more rapid. Longitudinal studies suggest that about 40 percent of people diagnosed with schizophrenia improve with treatment and function reasonably well; the rest continue to show symptoms that permanently impair their functioning (Harrow & Jobe, 2005; Jobe & Harrow, 2010) and—especially for those with a drug abuse problem—may lead to homelessness (Timms, 2005). A strong predictor of treatment outcome is *premorbid adjustment*, which refers to the level of functioning a person had achieved before schizophrenia symptoms first appeared. Improvement is more likely in those who had reached

schizophrenia A pattern of severely disturbed thinking, emotion, perception, and behavior that constitutes one of the most serious and disabling of all mental disorders.

higher levels of education and employment and who had supportive relationships with family and friends (Keshavan et al., 2005; Rabinowitz et al., 2002).

As described in the next section, schizophrenia symptoms can vary widely from person to person, and the severity of symptoms can range from mild to extreme.

Symptoms of Schizophrenia

The main problems seen in people with schizophrenia relate to thinking—both how they think and what they think (Heinrichs, 2005). Indeed, the very word *schizophrenia*, or “split mind,” refers to the oddities of schizophrenic thinking, including a splitting of normally integrated mental processes, such as thoughts and feelings. So the person may giggle while talking about sad events and claiming to feel unhappy. Contrary to common usage, schizophrenia does not refer to the “split personality” seen in dissociative identity disorder (multiple personality disorder).

Schizophrenic thought and language are often disorganized, as illustrated in the following letter that arrived in the mail several years ago:

Dear Sirs:

Pertaining to our continuing failure to prosecute violations of minor's rights to sovereign equality which are occurring in gestations being compromised by the ingestion of controlled substances, ... the skewing of androgyny which continues in female juveniles even after separation from their mother's has occurred, and as a means of promulgating my paying Governor Hickel of Alaska for my employees to have personal services endorsements and controlled substance endorsements, ... the Iraqi oil being released by the United Nations being identified as Kurdishian oil, and the July, 1991 issue of the Siberian Review spells President Eltsin's name without a letter y.

People with schizophrenia may create *neologisms*, or new words, that are usually nonsensical and have meaning only to the person speaking them. The word “promulgating” in the preceding letter is one example. The letter also illustrates *loose associations*, the tendency for one thought to be logically unconnected or only loosely connected to the next. In the most severe cases, thought becomes just a jumble known as *word salad*. For example, one patient was heard to say, “Upon the advisability of held keeping, environment of the seabeach gathering, to the forest stream, reinstatement to be placed, poling the paddleboat, of the swamp morass, to the forest compensation of the dunce” (Lehman, 1967, p. 627).

The content of schizophrenic thinking is also disturbed. Often it includes a bewildering assortment of *delusions* (false beliefs), especially *delusions of persecution*. Some patients believe that space aliens or government agents are trying to steal their internal organs, and they may interpret everything from TV commercials to casual hand gestures as part of the plot. Delusions that such common events are somehow related to oneself are called *ideas of reference*. *Delusions of grandeur* may also appear; one young man was convinced that the president of the United States was trying to contact him for advice. Other types of delusions include *thought broadcasting*, in which patients believe that their thoughts can be heard by others; *thought blocking* or *thought withdrawal*, the belief that someone is either preventing thoughts or “stealing” them as they appear; and *thought insertion*, the belief that other people’s thoughts are appearing in one’s own mind. Some patients believe that their behavior is being controlled by others; in one case, a man claimed that the CIA had placed a control device in his brain. Such delusions tend to be deeply entrenched and resistant to change, no matter how strong the evidence against them (Minzenberg et al., 2008; Woodward et al., 2006).

hallucinations False or distorted perceptions of objects or events.

Hallucinations, or false perceptions that are not caused by sensory stimuli from the environment, are common in schizophrenia. Often, schizophrenic hallucinations emerge as voices. These voices may sound like an overheard conversation or they may urge the person

LINKAGES Do people perceive hallucinations as real sensory events? (a link to Sensation and Perception)

to do or not to do things. Sometimes they comment on, narrate, or (most often) criticize the person's actions. Hallucinations can also involve the experience of nonexistent sights, smells, tastes, and touch sensations. The brain areas activated during hallucinations are related to those that respond to real sights and sounds (Simons et al., 2010).

People with schizophrenia often say that they cannot focus their attention. They may feel overwhelmed as they try to attend to everything at once. Various perceptual disorders may also appear. The person may feel detached from the world and see other people as flat cutouts. The body may feel like a machine or parts of it may seem to be dead or rotting. Emotional expression is often muted—a pattern called *flat affect*. But when people with schizophrenia do display emotion, it is often exaggerated or inappropriate (Kring et al., 2011; Kring & Caponigro, 2010). For example, they may cry for no apparent reason or fly into a rage in response to a simple question.

Some people with schizophrenia are quite agitated, constantly fidgeting, grimacing, or pacing the floor in ritualized patterns. Others become so withdrawn that they move very little. Lack of motivation and poor social skills, deteriorating personal hygiene, and an inability to function in everyday situations are other common characteristics of schizophrenia.

The Schizophrenia Spectrum

Researchers have made some useful distinctions among various forms of schizophrenia. One of these distinctions involves the presence of positive versus negative symptoms. Disorganized thoughts, delusions, and hallucinations are sometimes called *positive symptoms* of schizophrenia, because they appear as undesirable *additions* to a person's mental life (Iancu et al., 2005; Smith et al., 2006). In contrast, the absence of pleasure and motivation, lack of emotion, social withdrawal, reduced speech, and other deficits seen in schizophrenia are sometimes called *negative symptoms*, because they appear to *subtract* elements from normal mental life (Batki et al., 2008). Many patients exhibit both positive and negative symptoms, but when the negative symptoms are stronger, schizophrenia generally has a more severe course, including long-term disability and relative lack of response to treatment (e.g., Kirkpatrick et al., 2006; Milev et al., 2005; Prikryl et al., 2006).

Yet another way of categorizing schizophrenia symptoms focuses on whether they are *psychotic* (e.g., hallucinations or delusions), *disorganized* (e.g., incoherent speech, chaotic behavior, or inappropriate affect), or *negative* (e.g., lack of speech or motivation). The fact that, like positive and negative symptoms, these dimensions of schizophrenia are to some extent independent from one another suggests to some researchers that each symptom cluster or dimension may ultimately be traceable to different causes that may require different treatments (Jones & Meaden, 2012).

The schizophrenia spectrum also includes other diagnoses that share features with schizophrenia. For example, people diagnosed with *schizoaffective disorder* show symptoms of both schizophrenia and depression. *Schizophreniform disorder* is characterized by schizophrenia-like symptoms that do not last as long as those typically seen in schizophrenia, and in *delusional disorder*, symptoms mainly involve a persistent pattern of false beliefs.

Causes of Schizophrenia

The search for causes of schizophrenia has been more intense than for any other psychological disorder. The findings so far confirm one thing for certain: as with other disorders, biological, psychological, and sociocultural factors combine to cause or worsen all forms of schizophrenia (Sullivan, Kendler, & Neale, 2003; Tandon, Nasrallah, & Keshaven, 2009).

Biological Factors

Research in behavioral genetics shows that schizophrenia runs in families (Gottesman et al., 2010). If one person in a family is diagnosed with schizophrenia, the risk that another family member will receive the same diagnosis increases in proportion with their

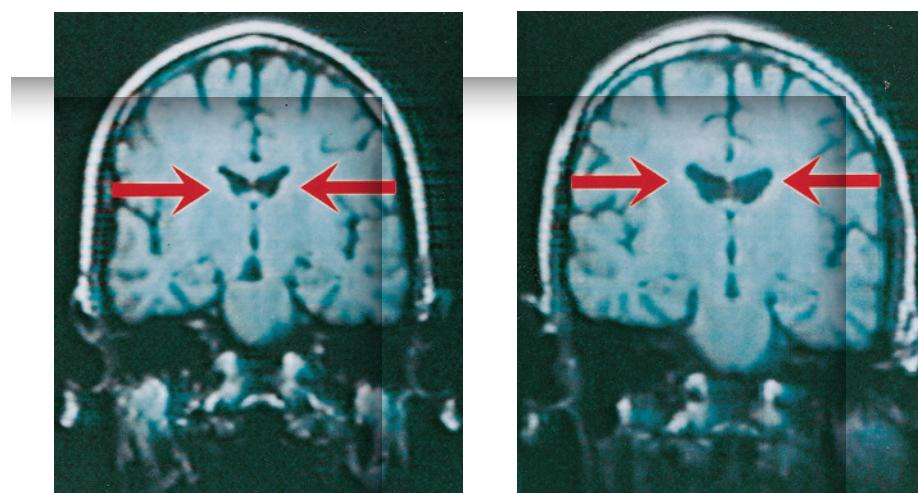
genetic similarity (Kasper & Papadimitriou, 2009). Even if they are adopted by families in which there is no schizophrenia, the children of parents with schizophrenia are ten times more likely to develop schizophrenia than adopted children whose biological parents do not have schizophrenia (Kety et al., 1994; Tienari et al., 2003). But even though identical twins have virtually identical genes, the appearance of schizophrenia in one of them does not guarantee that the other will be diagnosed as well. In fact, the rate of shared diagnosis is only about 50 percent, which suggests that genetics alone cannot explain the disorder. Further, it is unlikely that a single gene transmits schizophrenia (Plomin & McGuffin, 2003; Pogue-Geile, & Yokley, 2010). Rather, several genes on several chromosome pairs are probably involved, and probably combine with nongenetic factors to cause the disorder. Researchers in the field of epigenetics are studying how environmental factors alter the expression of genes associated with schizophrenia (Akbarian, 2010; Pogue-Geile, & Yokley, 2010).

The search for biological factors in schizophrenia also focuses on a number of abnormalities in the structure, functioning, and chemistry of the brain that tend to appear in people with schizophrenia (e.g., Grace, 2010; Lynall et al., 2010; Meyer-Lindenberg, 2010; Rasmussen et al., 2010; van Haren et al., 2012). For example, as shown in Figure 14.4, brain-imaging studies have compared schizophrenia patients with other mental patients (Salgado-Pineda et al., 2010). Many patients with schizophrenia (especially those who display mostly negative symptoms) have less tissue in areas of the brain that are involved in emotional expression, thinking, and information processing—functions that are disordered in schizophrenia (e.g., Arango et al., 2012; Goto, Yang, & Otani, 2010; Rimol, Nesvåg et al., 2012; Ursu et al., 2011). There is also evidence that worsening symptoms are associated with continued tissue loss in these areas (Ho et al., 2003). Patients with mainly positive symptoms tend to have essentially normal-looking brains (Andreasen, 1997).

Researchers are also investigating the possibility that abnormalities in brain chemistry—especially in neurotransmitter systems that use dopamine—play a role in causing or intensifying the symptoms of schizophrenia (Javitt & Kantrowitz, 2009; Tan et al., 2007). Because drugs that block the brain's dopamine receptors often reduce the hallucinations, disordered thinking, and other positive symptoms of schizophrenia, some investigators speculate that schizophrenia results from excess dopamine. Other research suggests that excessive activity in dopamine systems may be related to the appearance of these positive symptoms (Buchsbaum et al., 2006; Winterer, 2006). However, the relationship between dopamine and schizophrenia may be more complex than that. For example, it may be that changes in the ratio of dopamine to other neurochemicals, particularly in the region of the thalamus, are involved in the difficulties experienced by people with schizophrenia in distinguishing genuine sights and sounds from those produced by neural “noise” within the brain (Buchsbaum et al., 2006; Winterer, 2006).

FIGURE 14.4 Brain Abnormalities in Schizophrenia

Here is a magnetic resonance imaging (MRI) comparison of the brains of identical twins. The schizophrenic twin (photo at right) has greatly enlarged ventricles (see arrows) and correspondingly less brain tissue, including in the hippocampal area, a region involved in memory and emotion. The same results appeared in fourteen other identical-twin pairs. By contrast, no significant differences appeared between members of a seven-pair control group of normal identical twins (Suddath et al., 1990). These results support the idea that brain abnormalities are associated with schizophrenia and, because identical twins have the same genes, that such abnormalities may stem from nongenetic factors (Baare et al., 2001).



National Institute of Mental Health

Some researchers are integrating genetic and environmental explanations for schizophrenia by looking for *neurodevelopmental* abnormalities (e.g., Meyer et al., 2005; Rapoport, Addington, & Frangou, 2005). Perhaps, they say, some disorders in the schizophrenia spectrum arise from disruptions in brain development during the period from before birth through childhood, when the brain is growing and its various functions are maturing (King, St-Hilaire, & Heidkamp, 2010; Walker et al., 2010). For instance, prenatal exposure to physical trauma, flu, or other infections is associated with increased risk for developing schizophrenia (e.g., Brown & Derkits, 2010; Subotnik et al., 2006). The expression of a genetically transmitted predisposition for brain abnormality may be enhanced by environmental factors such as maternal drug use during pregnancy, oxygen deprivation or other complications during birth, or childhood malnutrition (Sørensen et al., 2003; NIMH, 2008b). For example, as mentioned earlier, smaller-than-normal prefrontal lobes and other brain structures appear to constitute an inherited predisposition for schizophrenia. However, reduced brain growth alone is not sufficient to cause the disorder. When only one member of an identical-twin pair has schizophrenia, both tend to have unusually small brains, but the schizophrenic twin's brain in each pair is the smaller of the two (Baare et al., 2001). This finding suggests that some environmental influence caused degeneration in an already underdeveloped brain, making it even more prone to function abnormally.

Psychological and Sociocultural Factors

Psychological processes and sociocultural influences can contribute to the appearance of schizophrenia and influence its course (Kealy, 2005; Vahia & Cohen, 2009). Among the factors cited are dysfunctional cognitive habits, the stress of urban living, the stigma of being labeled with a severe mental disorder, being an immigrant, and exposure to stressful family communication patterns (e.g., Henry, von Hippel, & Shapiro, 2010; Mueser & Jeste, 2009). For example, criticism by family members—sometimes called *expressed emotion*—is associated with more severe symptoms (Nomura et al., 2005; Polanczyk et al., 2010). And if individuals with schizophrenia live with relatives who are critical, unsupportive, or emotionally overinvolved, they're especially likely to relapse following initial improvement (Hooley, 2004). Family members' negative attitudes may be a source of stress that actually increases the chances that disruptive or odd behaviors will persist or worsen (Rosenfarb et al., 1995). Keep in mind, though, that the strange and often disturbing behavior of a family member with schizophrenia can place tremendous strain on the rest of the family, making it harder for them to remain helpful and supportive (Kymalainen et al., 2006; Rosenfarb, Bellack, & Aziz, 2006). In any case, patients who are helped to cope with potentially damaging family influences tend to have better long-term outcomes (Bustillo et al., 2001; Velligan et al., 2000).

Vulnerability Theory

All the causal theories of schizophrenia we have outlined are consistent with the diathesis-stress approach, which assumes that stress activates a person's predisposition for disorder (Stahl, 2007). ("In Review: Schizophrenia Spectrum Disorders" summarizes these theories, as well as the symptoms of schizophrenia.) In fact, a diathesis-stress framework forms the basis for the *vulnerability theory* of schizophrenia (Cornblatt & Erlenmeyer-Kimling, 1985; Zubin & Spring, 1977). This theory suggests that (1) vulnerability to schizophrenia is mainly biological; (2) different people have differing degrees of vulnerability; (3) vulnerability is influenced partly by genetic influences on development and partly by abnormalities that arise from environmental risk factors; and (4) psychological components, such as exposure to poor parenting, a high-stress environment, or inadequate coping skills, may help determine whether schizophrenia actually appears and may also influence its course (van Os, Kenis, & Rutten, 2010; Wearden et al., 2000).

Many different blends of vulnerability and stress can lead to schizophrenia. People whose genetic characteristics or prenatal experiences leave them vulnerable to developing schizophrenia may be especially likely to do so if they are later exposed to learning experiences, family conflicts, or other stressors that trigger and maintain schizophrenic patterns of thought and

action. Those same experiences and stressors would not be expected to lead to schizophrenia in people who are less vulnerable to developing the disorder. In other words, schizophrenia is a highly complex spectrum of related disorders (Kirkpatrick et al., 2001; Lenzenweger, McLachlan, & Rubin, 2007) whose origins appear to lie in numerous biological, psychological, and sociocultural domains, some of which are yet to be discovered (Gilmore, 2010).

IN REVIEW	
SCHIZOPHRENIA SPECTRUM DISORDERS	
Aspect	Key Features
Common Symptoms	
Disorders of thought	Disturbed content, including delusions; disorganization, including loose associations, neologisms, and word salad.
Disorders of perception	Hallucinations or false perceptions; poorly focused attention.
Disorders of emotion	Flat affect; inappropriate tears, laughter, or anger.
Possible Causes	
Biological	Genetics; abnormalities in brain structure; abnormalities in dopamine systems; neurodevelopmental problems.
Psychological and sociocultural	Learned maladaptive behavior; disturbed patterns of family communication.
In Review Questions	
1. The _____ approach forms the basis of the vulnerability theory of schizophrenia.	
2. Hallucinations are _____ symptoms of schizophrenia; lack of emotion is a _____ symptom.	
3. Patients with schizophrenia who were able to finish school are _____ likely to show improvement.	

PERSONALITY DISORDERS

Which personality disorder often leads to crime?

Personality disorders are long-standing, relatively inflexible ways of behaving that are not so much severe mental disorders as dysfunctional styles of living (McMurran, 2012). Some psychologists view these disorders as habitual interpersonal strategies (Kiesler, 1996) or as extreme, rigid, and maladaptive expressions of personality traits (Widiger, 2008). In order to be labeled as personality disorders rather than just, say, annoying or unsatisfactory lifestyles, they must be judged by a diagnostician to have reached a level of severity that affects all areas of functioning and, beginning in childhood or adolescence, create problems for those who display them and for others (American Psychiatric Association, 2013).

The ten personality disorders listed in DSM-5 are grouped into three clusters that share certain features (see Table 14.4). The *odd-eccentric* cluster (Cluster A) includes paranoid,

personality disorders Long-standing, inflexible ways of behaving that become styles of life that create problems for the person affected and/or others.

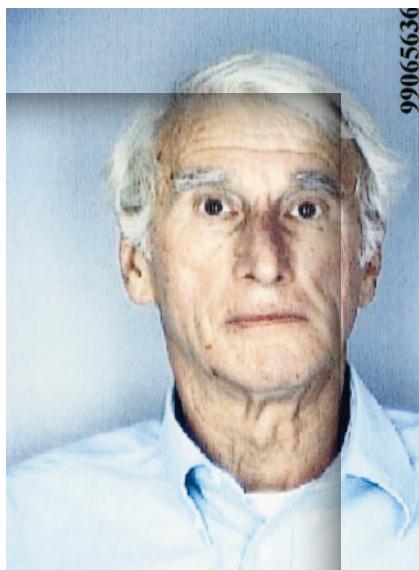
TABLE 14.4 PERSONALITY DISORDERS

Here are brief descriptions of the ten personality disorders listed in DSM-5.

Type	Typical Features
Cluster A (odd-eccentric)	Paranoid Suspiciousness and distrust of others, all of whom are assumed to be hostile.
	Schizoid Detachment from social relationships; restricted range of emotion.
	Schizotypal Detachment from and great discomfort in social relationships; odd perceptions, thoughts, beliefs, and behaviors.
Cluster B (dramatic-erratic)	Histrionic Excessive emotionality and preoccupation with being the center of attention, emotional shallowness, overly dramatic behavior.
	Narcissistic Exaggerated ideas of self-importance and achievements, preoccupation with fantasies of success, arrogance.
	Borderline Lack of stability in interpersonal relationships, self-image, and emotion; impulsivity; angry outbursts; intense fear of abandonment; recurring suicidal gestures.
	Antisocial Shameless disregard for and violation of other people's rights.
Cluster C (anxious-fearful)	Dependent Helplessness, excessive need to be taken care of, submissive and clinging behavior, difficulty in making decisions.
	Obsessive-compulsive Preoccupation with orderliness, perfection, and control.
	Avoidant Inhibition in social situations, feelings of inadequacy, oversensitivity to criticism.

schizoid, and schizotypal personality disorders. People diagnosed as having *schizotypal personality disorder*, for example, display some of the peculiarities seen in schizophrenia but are not disturbed enough to be labeled as having schizophrenia. The *dramatic-erratic* cluster (Cluster B) includes the histrionic, narcissistic, borderline, and antisocial personality disorders. The main characteristics of *narcissistic personality disorder*, for example, are an exaggerated sense of self-importance, extreme sensitivity to criticism, a constant need for attention, and a tendency to arrogantly overestimate personal abilities and achievements. Finally, the *anxious-fearful* cluster (Cluster C) includes dependent, obsessive-compulsive, and avoidant personality disorders. *Avoidant personality disorder*, for example, is similar to social anxiety disorder in the sense that people labeled with this disorder tend to be "loners" with a long-standing pattern of avoiding social situations and of being particularly sensitive to criticism or rejection.

Personality disorder diagnoses are controversial, partly because people with these diagnoses sometimes produce more distress in others than in themselves, so the role of social and moral judgment in deciding who is disordered comes into play (McMurran, 2012). In addition, the overlap among symptoms of some of the personality disorders makes diagnosis difficult (Widiger, Livesley, & Clark, 2009). Studies that use symptom checklists or other behavioral measures to diagnose these disorders, as well as those that use molecular genetic data, generally identify either three or four clusters, not always what



A Classic Case of Antisocial Personality Disorder

Alfred Jack Oakley meets women through personal ads, claiming to be a millionaire movie producer, pilot, and novelist. In reality, he is a penniless con artist who uses his smooth-talking charm to gain the women's trust so he can steal from them. In January 2000, after being convicted of stealing a Florida woman's Mercedes, Oakley complimented the prosecutor's skills and the jury's wisdom and claimed remorse. The judge appeared to see through this ploy ("I don't believe there is a sincere word that ever comes out of your mouth"), but it was still effective enough to get Oakley probation instead of jail time!

Hillsborough County Sheriff, Tampa, Florida

antisocial personality disorder A long-term, persistent pattern of impulsive, selfish, unscrupulous, even criminal behavior.

would be expected according to DSM-5 (Fossati et al., 2006; Livesley, 2005). Some critics have suggested that there is gender bias in the application of diagnoses—pointing to the fact that women are labeled as borderline much more often than men, while men are labeled as antisocial more often than women (Bjorklund, 2006; Boggs et al., 2009). Even the stability of personality disorders over the lifetime has been questioned (Durbin & Klein, 2006).

The most serious, costly, and intensively studied personality disorder is **antisocial personality disorder**. It is marked by a long-term pattern of irresponsible, impulsive, unscrupulous, and sometimes criminal behavior, beginning in childhood or early adolescence (Hare, Neumann, & Widiger, 2012; Moreira et al., 2014). In the nineteenth century, the pattern was called *moral insanity* because the people displaying it appear to have no morals or common decency. Later, people in this category were called *psychopaths* or *sociopaths* (Coid & Ullrich, 2010; Hare & Newmann, 2009). The current "antisocial personality" label used in DSM-5 more accurately portrays them as troublesome but not "insane" by the legal standards we discuss later (Skeem et al., 2011). About 3 percent of men and about 1 percent of women in the United States fall into this diagnostic category (American Psychiatric Association, 2013; Hodgins, 2007).

At their least troublesome, these people are a nuisance. They are often charming, intelligent "fast talkers" who borrow money and fail to return it; they are arrogant, selfish manipulators who "con" people into doing things for them, usually by lying and taking advantage of the decency and trust of others. At their most troublesome, people with this disorder are criminals, sometimes violent ones. Persistent violent offenders, most of whom have antisocial personality disorder, make up less than 5 percent of the male population, but they commit over 50 percent of violent crimes (Hodgins, 2007). A hallmark of those displaying antisocial personality is a lack of anxiety, remorse, or guilt, whether they have wrecked a borrowed car or killed an innocent person (Gray et al., 2003; Hare & Newmann, 2009).

No method has yet been found for permanently altering the behavior of individuals with antisocial personality disorder (Hare et al., 2012). Research suggests that the best hope for dealing with them is to identify their antisocial personalities early, before the most treatment-resistant traits are fully developed (Compton et al., 2005; Diamantopoulou, Verhulst, & van der Ende, 2010). Fortunately, these individuals tend to become less active and dangerous after about age forty (Hare et al., 2012). If, as sometimes happens, people with milder forms of antisocial personality disorder also have a certain degree of conscientiousness, they may become successful in socially acceptable roles, often in the world of politics or business (Mullins-Sweatt, et al., 2010).

You might wonder whether terrorists and suicide bombers should be classified as antisocial personalities—after all, they exhibit violent and disruptive behavior in the extreme. Some terrorists do exhibit the characteristics of antisocial personality disorder, but most do not (Martens, 2004). Acts of terrorism are probably better explained from the perspective of social and political psychology—terrorists are spurred to take extreme destructive measures by political and religious ideologies during intense group conflict (Saucier et al., 2009). In short, the psychology of group conflict and war might better explain the terrorism of today, just as it might have explained the terrifying behavior of Japanese kamikaze pilots during World War II.

There are numerous theories about the causes of antisocial personality disorder. Some research suggests a genetic predisposition (Arseneault et al., 2003; Larsson, Andershed, & Lichtenstein, 2006), possibly in the form of abnormal brain development, impaired neurological functioning, deficits in the ability to encode or recall emotional information, or chronic underarousal of both the autonomic and central nervous systems (e.g., Craig et al., 2009; Crozier et al., 2008; Raine et al., 2005; Visser et al., 2010). This underarousal may render people less sensitive to punishment and more likely to seek excitement than is normally the case (Fowles & Dindo, 2009; Gao et al., 2010). Broken homes, rejection

by parents, poor discipline, lack of good parental models, lack of attachment to early caregivers, impulsivity, conflict-filled childhoods, and poverty have all been suggested as psychological and sociocultural factors that contribute to the development of antisocial personality disorder (e.g., Caspi et al., 2004; Lahey et al., 1995; Lyman & Gudonis, 2005). The biopsychosocial approach suggests that antisocial personality disorder results when these psychosocial and environmental conditions combine with a genetic predisposition to low arousal and the sensation seeking and impulsivity associated with it (Beach, et al., 2010; Diamantopoulou, Verhulst, & van der Ende, 2010).

FOCUS ON RESEARCH METHODS

EXPLORING LINKS BETWEEN CHILD ABUSE AND ANTISOCIAL PERSONALITY DISORDER

Exploring Links between Child Abuse and Antisocial Personality Disorder

One of the most prominent environmental factors associated with the more violent forms of antisocial personality disorder is the experience of abuse in childhood (MacMillan et al., 2001). However, most of the studies that have found a relationship between childhood abuse and antisocial personality disorder have been potentially biased (Monane, Leichter, & Lewis, 1984; Rosenbaum & Bennett, 1986). People with antisocial personalities—especially those with criminal records—are likely to make up stories of abuse to shift the blame for their behavior onto others. Even if their reports were accurate, however, most of these studies didn't compare the abuse histories of antisocial people with those of a control group from similar backgrounds who did not become antisocial. This research design flaw has made it almost impossible to separate the effects of reported child abuse from the effects of poverty or other factors that might also have contributed to the development of antisocial personality disorder.

What was the researcher's question?

Can childhood abuse cause antisocial personality disorder? To help answer this question and to correct some of the flaws in earlier studies, Cathy Widom (1989) used a *prospective* research design. They first found cases of childhood abuse and then followed the affected people over time to look at the effects of that abuse on adult behavior.

How did the researcher answer the question?

Widom began by identifying 416 adults whose backgrounds included official records of their having been physically or sexually abused before the age of eleven. She then explored the stories of these people's lives as told in police and school records as well as in a two-hour diagnostic interview. To reduce experimenter bias and distorted reporting, Widom made sure that the interviewers did not know the purpose of the study and that the respondents were told only that the study's purpose was to talk to people who had grown up in an urban area of the midwestern United States in the late 1960s and early 1970s. Widom also selected a comparison group of 283 people who had no histories of abuse but who were similar to the abused sample in terms of age, gender, ethnicity, hospital of birth, schools attended, and area of residence. Her goal was to obtain a nonabused control group that had been exposed to approximately the same environmental risk factors and socioeconomic conditions as the abused children.

What did the researcher find?

First, Widom (1989) tested the hypothesis that exposure to abuse in childhood is associated with criminality and/or violence in later life. She found that 26 percent of the abused youngsters went on to commit juvenile crimes, 29 percent were arrested as adults, and 11 percent committed violent crimes. These percentages were significantly higher than the figures for the nonabused group. The correlations between criminality and abuse were higher for males

(continued)

than for females and higher for African Americans than for European Americans. And overall, victims of physical abuse were more likely to commit violent crimes as adults than were victims of sexual abuse.

Next, Widom tested the hypothesis that childhood abuse is associated with the development of antisocial personality disorder (Luntz & Widom, 1994). She found that the abused group did show a significantly higher rate of antisocial personality disorder (13.5 percent) than the comparison group (7.1 percent). The apparent role of abuse in antisocial personality disorder was particularly pronounced in men, and it remained strong even when other factors—such as age, ethnicity, and socioeconomic status—were accounted for in the statistical analyses. One other factor—failure to graduate from high school—was also strongly associated with the appearance of antisocial personality, regardless of whether childhood abuse had occurred.

What do the results mean?

Widom's research supported earlier studies in finding an association between childhood abuse and criminality, violence, and antisocial personality disorder. Further, although her study did not permit a firm conclusion that abuse alone causes antisocial personality disorder, the data from its prospective design added strength to the argument that abuse may be an important causal factor (Widom, 2000). This interpretation is supported by the results of research by other investigators (Dudeck et al., 2007; Jaffee et al., 2004; McGrath, Nilsen, & Kerley, 2011). Finally, Widom's work offers yet another reason (as if more reasons were needed) why it is so important to prevent the physical and sexual abuse of children. The long-term consequences of such abuse can be tragic not only for its immediate victims but also for those victimized by the criminal actions and antisocial behavior of some abused children as they grow up (Weiler & Widom, 1996; Widom, Czaja, & Dutton, 2008).

What do we still need to know?

Widom's results suggest that child abuse can have a broad range of effects, all of which can derail normal childhood development. It is not yet clear, though, how abuse combines with other risk factors such as genetics or differences in neurocognitive functioning. More research is obviously needed to discover whether antisocial personality disorder stems from abuse itself, from one of the factors accompanying it, or from some specific combination of known and still-unknown risk factors (Beach et al., 2010). The importance of combined and interacting risk factors is suggested by the fact that abuse is often part of a larger pool of experiences, such as exposure to deviant models, social rejection, and poor supervision. For instance, child abuse might increase the likelihood of encountering stressful events later in life (Horwitz et al., 2001), thus creating a general vulnerability to a variety of psychological disorders, including antisocial personality disorder (Scott, Smith, & Ellis, 2010). Until we understand how all these potentially causal pieces fit together, we will not fully understand the role childhood abuse plays in the chain of events leading to antisocial personality disorder.

We need to know more, too, about why such a small percentage of the abused children in Widom's sample displayed violence, criminal behavior, and antisocial personality disorder. These results raise the question of which genetic characteristics or environmental experiences serve to protect children from at least some of the devastating effects of abuse (Flores, Cicchetti, & Rogosch, 2005; Rind, Tromovitch, & Bauserman, 1998). As described in the chapter on human development, some clues have already been found, but a better understanding of what these protective elements are might go a long way toward the development of programs to prevent antisocial personality disorder.

SOME ADDITIONAL PSYCHOLOGICAL DISORDERS

How do children's disorders differ from adults' disorders?

The disorders described so far represent some of the most common and socially disruptive psychological problems. Several others are mentioned in other chapters. In the chapter on consciousness, for example, we discuss insomnia, apnea, night terrors, and other sleep-wake disorders; intellectual disability is covered in the chapter on intelligence; and

posttraumatic stress disorder is described in the chapter on health, stress, and coping. Here we consider two other significant psychological problems: neurodevelopmental disorders and substance-related and addictive disorders.

Neurodevelopmental Disorders

The physical, cognitive, emotional, and social changes that occur in childhood—and the stress associated with them—can create or worsen psychological disorders in children. Stress can do the same in adults, but the neurodevelopmental disorders seen in childhood are not just miniature versions of adult psychopathology. Because children's development is still incomplete and because their capacity to cope with stress is limited, children are often vulnerable to special types of disorders. The DSM lists many neurodevelopmental disorders seen in infants, children, and adolescents, but the majority of them can be placed in two broad categories: externalizing disorders and internalizing disorders (Phares, 2014).

Externalizing Disorders

The *externalizing*, or *undercontrolled*, category includes behaviors that disturb people in the child's environment. Lack of control shows up as *conduct disorders* in about 2 to 9 percent of children and adolescents, mostly boys, and appears most frequently at around eleven or twelve years of age (Merikangas et al., 2010; Nock et al., 2006). Conduct disorders are characterized by a relatively stable pattern of aggression, disobedience, destructiveness, inappropriate sexual activity, academic failure, and other problematic behaviors (Frick & Nigg, 2012; Petitclerc & Tremblay, 2009). Often these behaviors involve criminal activity, pursued without remorse or empathy for victims, and they may signal the development of antisocial personality disorder (Lahey et al., 2005; Pardini, Frick, & Moffitt, 2010).

There may be a genetic predisposition toward externalizing disorders. For example, many children who display conduct disorder have parents who display antisocial personality disorder (Gelhorn et al., 2005). Children who are temperamentally inclined toward high activity levels and lack of concern for other people's feelings are at greater risk for externalizing disorders (Anastassiou-Hadjicharalambous & Warden, 2008; Pardini et al., 2010). There is no doubt, though, that parental and peer influences as well as academic problems at school combine with genetic factors to shape the antisocial behavior of these children (e.g., Brody et al., 2011; Giles et al., 2011; Jaffee et al., 2012; Lahey et al., 2011; Weitzman, Rosenthal, & Liu, 2011).

Another kind of externalizing problem, *attention deficit hyperactivity disorder (ADHD)*, is seen in up to 8 percent of children and in about 4 percent of adults, mainly boys and men (Bloom & Cohen, 2007; Merikangas et al., 2010). An ADHD diagnosis is given to children who are more impulsive, more inattentive, or both, than other children their age (Feldman & Reiff, 2014). Many of these children also have great difficulty sitting still or otherwise controlling their physical activity. They appear to be less able than other children to recognize emotions in others and to regulate their own emotions (Da Fonseca et al., 2009; Musser et al., 2011). Their impulsiveness and lack of self-control contribute to significant impairments in learning and to an astonishing ability to annoy and exhaust those around them. Children diagnosed with ADHD also tend to perform poorly on tests of attention, memory, decision making, and other information-processing tasks. As a result, ADHD is being increasingly viewed as more than just "bad behavior" (Halperin & Schulz, 2006; Krain & Castellanos, 2006).

Like so many other disorders, ADHD appears to result from the interaction of a genetic predisposition and environmental influences. The genes involved may be those that regulate dopamine, a neurotransmitter important in the functioning of the attention system (Bush, 2010; Gilden & Marusich, 2009; Waldman & Gizer, 2006). Other factors, such as brain damage, poisoning from lead or other household substances, and low birth weight may also play causal roles (Hudziak et al., 2005; Nigg, 2010; Nikolas & Burt, 2010). In some cases, problems in parenting may increase the risk for ADHD (Clarke et al., 2002). Exactly how all these factors might combine is still not clear.



Active or Hyperactive?

TRY THIS Normal behavior for children in one culture might be considered hyperactive in other cultures. Do people in the same culture disagree on what is hyperactive? To find out, ask two or three friends to join you in observing a group of children at a playground, a schoolyard, a park, or some other public place. Ask your friends to privately identify which children they would label as "hyperactive" and then count how many of their choices agree with yours and with others in your group.

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Also uncertain is exactly what constitutes hyperactivity. Cultural standards about acceptable activity levels in children vary, so a "hyperactive" child in one culture might be considered merely "active" in another. In fact, when mental health professionals from four cultures used the same rating scale to judge hyperactivity in a videotaped sample of children's behavior, the Chinese and Indonesians rated the children as significantly more hyperactive than did their U.S. and Japanese colleagues (Jacobson, 2002; Mann et al., 1992). And as mentioned earlier, there is evidence that African American children are diagnosed with ADHD only about two-thirds as often as European American children even when they have at least as many symptoms (Miller, Nigg, & Miller, 2009). Such findings remind us that sociocultural factors can be important determinants of what is expected or acceptable and thus what is considered abnormal.

Internalizing Disorders

The second broad category of child behavior problems involves *internalizing*, or *overcontrol*. Children in this category experience significant distress, especially depression and anxiety, and may be socially withdrawn (Luby, 2010). Those displaying *separation anxiety disorder*, for example, constantly worry that they will be lost, kidnapped, or injured or that some harm may come to a parent, usually the mother (Orgilés et al., 2009, 2011). The child clings desperately to the parent, and becomes upset or sick at the prospect of separation (Brand et al., 2011; Kossowsky et al., 2012). Refusal to go to school, sometimes called "school phobia," is often the result (Bahali, & Tahiroğlu, 2010; Iwata, Hazama, & Nakagome, 2012). Children who are temperamentally shy or withdrawn are at higher risk for internalizing disorders, but these disorders are also associated with environmental factors, including rejection or bullying by peers, and (especially for girls) being raised by a single parent (Phares, 2014).

Autism Spectrum Disorder

A few childhood disorders, including *autism spectrum disorder*, do not fall into either the externalizing or internalizing category. Children diagnosed with this disorder show deficits in communication and impaired social relationships. They also often show repetitive patterns of behavior (such as spinning objects) and unusual preoccupations and interests (American Psychiatric Association, 2013). This disorder is conceptualized as a spectrum disorder, such that some individuals are able to function relatively well and others show severe impairments (American Psychiatric Association, 2013). Estimates of the prevalence of autism spectrum disorder are consistently around 1 percent (American Psychiatric Association, 2013). It is diagnosed four times as often in boys than in girls (Kogan et al., 2009).

The children who show severe levels of impairment would have received a diagnosis of *autistic disorder* in DSM-IV. The earliest signs of severe autism spectrum disorder usually occur within the first thirty months after birth; these babies show little or no evidence of forming an attachment to their caregivers. Language development is seriously disrupted in most of these children; half of them never learn to speak at all. Individuals who display higher functioning or a less severe autism spectrum disorder would have been diagnosed with *Asperger's disorder* with DSM-IV. These individuals are able to function adaptively and, in some cases, independently as adults (Pexman et al., 2011).

Possible biological roots of autism spectrum disorder include genetic factors (e.g., Hallmayer et al., 2011; Sandin et al., 2014; St. Pourcain et al., 2010) or neurodevelopmental abnormalities that affect language and communication (Baron-Cohen, Knickmeyer, & Belmonte, 2005; Minshew & Williams, 2007). Researchers studying these biological factors are especially interested in the activity of *mirror neurons* in the brain. As described in the chapter on biological aspects of psychology, these neurons are activated when we see other people's actions, such as smiling, frowning, or showing disgust. Because they are in the areas of our own brain that control these same actions, activity in mirror neurons helps us to understand how the other person might be feeling and to empathize with those feelings. The functioning of mirror neurons appears disturbed in people with autism,

which may help explain why these individuals seem to operate with little appreciation for what others might be thinking or feeling (Welsh et al., 2009; Williams et al., 2006). This explanation has not been confirmed, however, (Yang-Teng et al., 2010), and other possible causal factors are also being investigated, including the effects of drugs, environmental chemicals, and infectious agents. Hypotheses that autism spectrum disorder is caused by cold and unresponsive parents or by vaccinations have been rejected by the results of scientific research (Dietert, Dietert, & DeWitt, 2011; Doja & Roberts, 2006).

Neurodevelopmental disorders seen in childhood differ from adult disorders not only because the patterns of behavior are distinct but also because their early onset disrupts development. To take just one example, children whose separation anxiety causes spotty school attendance may not only fall behind academically but also may fail to form the relationships with other children that promote normal social development (Wood, 2006). Some children never make up for this deficit. They may drop out of school and risk a life of psychiatric disorders, poverty, crime, and violence (Bahali, & Tahiroğlu, 2010; Doobay, 2008). Moreover, children depend on others to get help for their psychological problems, but all too often those problems may go unrecognized or untreated. For some, the long-term result may be adult forms of mental disorder. This is particularly tragic because early diagnosis and appropriate intervention can lead to significant improvement in childhood disorders (Ingersoll, 2011; Kurita, 2012).

Substance-Related and Addictive Disorders

Childhood disorders, especially externalizing disorders, often lead to substance-related disorders in adolescence and adulthood. The DSM-5 defines **substance-related disorders** as the use of alcohol or other psychoactive drugs for months or years in ways that harm the user or others. These disorders create major political, economic, social, and health problems worldwide. The substances involved most often are alcohol and other depressants (such as barbiturates), opiates (such as heroin), stimulants (such as cocaine or amphetamines), hallucinogenic drugs (such as LSD), and tobacco. About half of the world's population uses at least one psychoactive substance, and about two-thirds of people in the United States report that alcohol or drug addiction has affected them, their families, or their close friends (Leamon, Wright, & Myrick, 2008; Swendsen et al., 2012).

One effect of using some substances (including alcohol, heroin, and amphetamines) is **addiction** (also known as *dependence*), a physical need for the substance. Even when people with a substance use disorder do not become addicted, some may overuse, or *abuse* a drug, because it may give temporary self-confidence, enjoyment, or relief from tension. In other words, people can become psychologically dependent on psychoactive drugs without becoming physiologically addicted to them. But people who are psychologically dependent on a drug often have problems that are at least as serious as those of people who are addicted and that may be even more difficult to treat.

In the consciousness chapter, we describe how consciousness is affected by a wide range of psychoactive drugs. Here, we focus more specifically on the problems associated with the use and abuse of alcohol, heroin, and cocaine.

Alcohol Use Disorder

According to national surveys in the United States, 3.1 percent of the adult population abuse alcohol or are dependent on it in any given year, and 14 percent of adults have had these problems at some time in their lives (Kessler & Wang, 2008; Leamon, Wright, & Myrick, 2008). In previous versions of the DSM, *alcohol abuse* (a pattern of continuous or intermittent drinking with negative consequences) was distinguished from *alcohol dependence* (an addiction that almost always causes severe social, physical, and other problems). In DSM-5, the disorders of alcohol abuse and alcohol dependence were combined into an overarching diagnosis of *alcohol use disorder* (American Psychiatric Association, 2013). Males outnumber females in this category three to one, but the problem is on the rise among women and teenagers of both genders (Grucza et al., 2008). Alcohol use disorder

substance-related disorders Problems involving the use of psychoactive drugs for months or years in ways that harm the user or others.

addiction Development of a physical need for a psychoactive drug.

is greater among European Americans and American Indians than among African Americans and Hispanics; it is lowest among Asians (Substance Abuse and Mental Health Services Administration, 2007). Prolonged overuse of alcohol can result in life-threatening liver damage, impaired cognitive abilities, vitamin deficiencies that can lead to severe and permanent memory loss, and a host of other physical ailments (Reid et al., 2012).

Alcohol use disorder, commonly referred to as **alcoholism**, is a serious problem that is implicated in 40 to 50 percent of all automobile accidents, murders, and rapes (Butcher et al., 2010). Alcohol use disorder also figures prominently in child abuse and in elevated rates of hospitalization and absenteeism from work (Freisthler, 2011; Lawder et al., 2011; Lidwall & Marklund, 2011). Children growing up in families in which one or both parents abuse alcohol are more likely than other children to develop a host of psychological disorders, including substance-related disorders (Jones, 2007; Odgers et al., 2008). And as described in the chapter on human development, children of mothers who abused alcohol during pregnancy may be born with fetal alcohol syndrome. In short, alcohol use disorder carries a huge cost in personal suffering, medical expenditures, lost productivity, and shortened lifespans.

The biopsychosocial approach suggests that alcohol use disorder stems from a combination of genetically influenced characteristics (including inherited aspects of temperament such as impulsivity, a taste for novelty, and emotionality) and what people learn in their social and cultural environments. For example, the children of people with alcoholism are more likely than others to develop alcoholism themselves, and if the children are identical twins, both are at increased risk for alcoholism, even when raised apart (Reid et al., 2012). It is still unclear just what might be inherited or which genes are involved. One possibility involves inherited abnormalities in the brain's neurotransmitter systems or in the body's metabolism of alcohol (Reid et al., 2012). Males with alcoholism do tend to be less sensitive than other people to the effects of alcohol—a factor that may contribute to greater consumption (Graham et al., 2011; Vetter-O'Hagen, Carlinskaya, & Spear, 2009). Now that the human genome has been decoded, researchers are focusing on specific chromosomes as the possible location of genes that predispose people to—or protect them from—the development of alcoholism (e.g., Bierut et al., 2012). However, the genetics of addiction are highly complex; there is probably not a single gene for alcoholism (Reid et al., 2012). As with other disorders, alcoholism arises as many genes interact with each other and with environmental events, including parental influences. For example, one study found that boys whose fathers had alcoholism were at elevated risk for alcoholism, but not if the father's genetically identical *twin* had alcoholism (Jacob et al., 2003). In these cases, something in the boys' nonalcoholic family environment had apparently moderated whatever genetic tendency toward alcoholism they might have inherited.

Youngsters typically learn to drink by watching parents and peers (Abar, 2012). Their observations help shape their expectations, such as that alcohol will make them feel good and help them to cope with stressors (Schell et al., 2005). But alcohol use becomes a problem if drinking is a person's main coping strategy (National Institute on Alcohol Abuse and Alcoholism, 2001). The importance of learning is supported by evidence that alcoholism is more commonly reported among ethnic and cultural groups in which frequent drinking tends to be socially approved, such as the Irish and English, than among religious or ethnic groups in which all but moderate drinking tends to be discouraged, such as Jews, Italians, and Chinese (Koenig, Haber, & Jacob, 2011; Ryan & Hout, 2011; Schwartz et al., 2011). Moreover, different forms of social support for drinking can result in different consumption patterns within a cultural group (Biron, Banberger, & Noyman, 2011; McKay et al., 2011). For example, one study found significantly more drinking among Japanese men living in Japan (where social norms for male drinking are most permissive) compared with Japanese men living in Hawaii or California, where excessive drinking is less strongly supported (Kitano et al., 1992). Learning may also help explain why rates of alcoholism are higher than average among bartenders, cocktail servers, and others who work where alcohol is available and drinking is socially reinforced or even expected (Fillmore & Caetano, 1980). (Of course, it is also possible that attraction to alcohol led some of these people into such jobs in the first place.)

alcoholism A pattern of drinking that may lead to addiction and that almost always causes severe social, physical, and other problems.

Heroin Use Disorder and Cocaine Use Disorder

Like people with alcoholism, those who develop a substance-related disorder involving heroin or cocaine suffer many serious health problems as a result of both the drugs themselves and the poor eating and health habits related to use of those drugs. The risk of death from overdose, contaminated drugs, AIDS (contracted through shared needles), or suicide is also always present. Drug dependence tends to be more prevalent among males, especially young males (Compton et al., 2007; Reid et al., 2012).

Continued use or overdoses of cocaine can cause problems ranging from nausea and hyperactivity to paranoid thinking, sudden depressive “crashes,” and even death. Cocaine use has been on the decline since 1985, but it is still a serious problem. Surveys indicate that 7.7 percent of high school seniors in the United States have used cocaine at some time in their lives, and millions more teens and adults still use it on occasion (Johnston et al., 2004). The widespread availability of crack, a powerful and relatively cheap form of cocaine, has made it one of the most dangerous and addicting of all drugs. Pregnant women who use cocaine are much more likely than nonusers to lose their babies through spontaneous abortion, placental detachment, early fetal death, or stillbirth.

Addiction to heroin and cocaine appears in about 4 percent of the adult population in the United States (Compton et al., 2005) and is mainly a biological process brought about by the physical effects of the drugs (Kalivas & Volkow, 2005; Phillips et al., 2003). Explaining why people first use these drugs is more complicated. Beyond the obvious and immediate pleasure these drugs provide, the causes of initial drug use are less well established than the reasons for alcohol abuse. Some research has identified structural abnormalities in the brains of people who become addicted to stimulant drugs (Ersche et al., 2012). Another line of research suggests that there might be a genetic tendency toward behavioral compulsions that predisposes some people to abuse many kinds of drugs (Fernández-Serrano et al., 2012; Koob & Volkow, 2010; Reid et al., 2012). One study supporting this idea found a link between alcoholism in biological parents and drug abuse in the sons they had given up for adoption (Cadoret et al., 1995). The same study also found a link between antisocial personality traits in biological parents and antisocial acts—including drug abuse—in the sons they had put up for adoption.

A number of psychological and environmental factors have been proposed as promoting initial drug use (Vedel & Emmelkamp, 2012). These include seeing parents use drugs, being abused in childhood, using drugs to cope with stressors or to ease anxiety or depression, associating drug use with pleasant experiences, seeking popularity, caving in to peer pressure, and thrill seeking (Ferguson & Meehan, 2011; García-Montes et al., 2009; Rudolph et al., 2011; Tucker et al., 2011). Research has not yet established why continued drug use occurs in some people and not in others, but, again, it is likely that a biological predisposition interacts with psychological processes and stressors that play out their roles in specific social and cultural contexts.

MENTAL ILLNESS AND THE LAW

Can insanity protect criminals from punishment?

Have you wondered why the word *insanity* doesn't appear in our definition of *mental disorder* or in the DSM-5 categories we have described? The reason is that *insanity* is a legal term, not a medical diagnosis or psychological term (Torry & Billick, 2010). For example, John Hinckley, Jr., was found *not guilty by reason of insanity* for his attempted assassination of President Ronald Reagan in 1981. This verdict reflected U.S. laws and rules that protect people with severe psychological disorders when they are accused of crimes (Cassel & Bernstein, 2007). Many other countries around the world have similar laws (Goldstein, Morse, & Packer, 2013).

This protection takes two forms. First, under certain conditions, people designated as mentally ill may be protected from criminal prosecution. If at the time of trial individuals accused of crimes are unable to understand the proceedings and charges against them or



Assessment of Mental Competence

Andrea Yates admitted to drowning her five children in the bathtub of her Houston, Texas, home in 2001. She had twice tried to kill herself in previous years, and she was reportedly depressed at the time of the murders. Accordingly, she pleaded not guilty by reason of insanity. The first legal step in deciding her fate was to confine her in a mental institution to assess her mental competency to stand trial. Following the testimony of psychologists who examined her, she was found competent and ultimately sentenced to life in prison. Her conviction was overturned on appeal, though, and at a second trial in 2006, she was found not guilty by reason of insanity and committed to a mental hospital.

AP Images/Brett Coomer, Pool

help their attorneys to prepare a defense, they are declared *mentally incompetent* to stand trial. When that happens, defendants are sent to a mental institution for treatment until they are judged to be mentally competent (Zapf & Roesch, 2011). If they are still not competent after some specified period—two years, in many cases—defendants may be ruled permanently ineligible for trial and either committed to a mental institution or released. Release is rare, however, because most defendants who are unable to meet competency standards have mental disorders that are serious enough to pose a danger to themselves or others.

Second, the mentally ill may be protected from punishment. In most U.S. states, defendants may be judged not guilty by reason of insanity if at the time of the crime mental illness prevented them from (1) understanding what they were doing; (2) knowing that what they were doing was wrong; and (3) resisting the impulse to do wrong. The first two of these criteria relate to a person's ability to think clearly and are called the *M'Naghten rule*, for the defendant in the 1843 case that established it. The third criterion, which relates to

the defendant's emotional state during a crime, is known as the *irresistible impulse test*. All three criteria were combined in a rule proposed by the American Law Institute in 1962—a rule that is now followed in about one-third of U.S. states: "A person is not responsible for criminal conduct if at the time of such conduct as a result of mental disease or defect he lacks substantial capacity either to appreciate the criminality (wrongfulness) of his conduct or to conform his conduct to the requirements of law" (p. 66).

After the Hinckley verdict, the U.S. Congress passed the Insanity Defense Reform Act, which eliminated the irresistible impulse criterion from the definition of insanity in federal cases. About 75 percent of the U.S. states have passed similar or related reform laws (Giorgi-Guarnieri et al., 2002); in about half the states, these laws require the use of some version of the narrower M'Naghton rule (American Psychiatric Association, 2003). Whatever criteria are used, when defendants plead insanity, judges and juries must decide whether these people should be held responsible for criminal acts. Defendants who are judged not guilty by reason of insanity and who still display a psychological disorder are usually required to receive treatment, typically through commitment to a hospital, until judged to be cured or no longer dangerous. Thirteen U.S. states have laws allowing jurors to find defendants *guilty but mentally ill*. These defendants are supposed to receive treatment while in prison, though they seldom do (Cassel & Bernstein, 2007). A second reform already noted is that federal courts no longer use the irresistible-impulse criterion in defining insanity. Third, federal courts and some state courts now require defendants to prove that they were insane at the time of their crime, rather than requiring the prosecution to prove that the defendants were sane.

Critics of insanity rules complain that these rules allow criminals to "get away with murder." Actually, such outcomes are rare. Insanity pleas occur in only 1 out of every 200 felony cases in the United States, and they are successful in only 2 of every 1,000 attempts (American Psychiatric Association, 2003). Even the few defendants found not guilty by reason of insanity in the United States may be hospitalized for at least as long as they would have spent in prison had they been found guilty (Roesch, Zapf, & Hart, 2010). Those with the most severe disorders may never be released. John Hinckley, Jr., has been in Saint Elizabeth's Hospital in Washington, D.C., since 1982, and in spite of his annual efforts to be released and court approval for longer visits with his mother outside the hospital, he is unlikely to be freed anytime soon.

In summary, society is constantly seeking the proper balance between protecting the rights of defendants and protecting society from dangerous criminals. In the process, the sociocultural values that shape our views about what is abnormal also influence judgments about the extent to which abnormality should relieve people of responsibility for criminal behavior (O'Connell, 2011).

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of how mental disorders might be learned illustrates just one way that the topic of this chapter, psychological disorders, is linked to the subfield of learning, which is discussed in the chapter by that name. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 14 Psychological Disorders



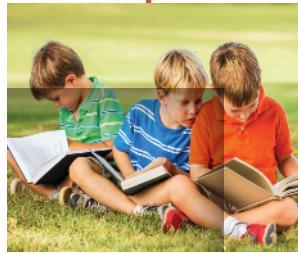
LINKAGES

Are some psychological disorders inherited?



CHAPTER 3
Biological Aspects
of Psychology

Can we learn to become abnormal?



CHAPTER 5
Learning

Can personality tests be used to diagnose mental disorders?



CHAPTER 13
Personality

SUMMARY

Psychopathology involves patterns of thinking, feeling, and behaving that are maladaptive, disruptive, or distressing, either for the person affected or for others.

Defining Psychological Disorders

How do psychologists define abnormal behavior?

Some psychological disorders show considerable similarity across cultures, but the definition of abnormality is largely determined by social and cultural factors. The criteria for judging abnormality include deviance (statistical infrequency and norm violations), distress (personal suffering), and dysfunction. Each of these criteria is flawed to some extent. The practical approach, which considers the content, context, and consequences of behavior, emphasizes the question of whether individuals show impaired functioning in fulfilling the roles appropriate for particular people in particular settings, cultures, and historical eras.

Explaining Psychological Disorders

What causes abnormality?

At various times and places, abnormal behavior has been attributed to the action of gods or the devil. Mental health professionals in Western cultures rely on a **biopsychosocial approach**, which attributes mental disorders to the interaction of biological, psychological, and **sociocultural factors**. Biological factors, such as brain chemistry, are highlighted by the medical or **neurobiological model** of disorder. The **psychological model** focuses on processes such as inner conflicts, maladaptive learning experiences, or blocked personal growth. The **sociocultural perspective** helps explain disorder by focusing on the social relations, social support, and cultural and subcultural factors that form the context of abnormality. The **diathesis-stress model** suggests that biological, psychological, and sociocultural characteristics create predispositions for disorder that are translated into symptoms in the face of sufficient amounts of stress.

Classifying Psychological Disorders

How many psychological disorders have been identified?

The dominant system for classifying abnormal behavior in North America is the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* of the American Psychiatric Association. It includes more than 300 specific categories of mental disorder. Diagnosis helps identify the features, causes, and most effective methods of treating various psychological disorders. Research on the reliability and validity of the DSM shows that it is a useful but not perfect classification system.

Anxiety Disorders

What is a phobia?

Long-standing and disruptive patterns of anxiety characterize **anxiety disorders**. The most prevalent type of anxiety disorder is **phobia**, a category that includes **specific phobias**, **social anxiety disorder (social phobia)**, and **agoraphobia**. Other anxiety disorders are **generalized anxiety disorder**, which involves nonspecific anxiety, and **panic disorder**, which brings unpredictable attacks of intense anxiety.

Obsessive-Compulsive and Related Disorders

What are obsessive rituals?

Obsessive-compulsive disorder (OCD) is characterized by uncontrollable repetitive thoughts called **obsessions** and ritualistic actions called **compulsions**. Obsessional jealousy and **body dysmorphic disorder** also fall in this category.

The most influential explanations of anxiety and obsessive-compulsive disorders suggest that they may develop when a biological predisposition for strong anxiety reactions combines with fear-enhancing thought patterns and learned anxiety responses. Many anxiety disorders appear to develop in accordance with the principles of classical and operant conditioning and with those of observational learning. People may be biologically prepared to learn fear of certain objects and situations.

Somatic Symptom and Related Disorders

Can mental disorder cause blindness?

Somatic symptom disorders appear as physical problems that have no apparent physical cause or as intense preoccupation with physical illness or deformity. They include **conversion disorder**, which involves problems such as blindness, deafness, and paralysis that have no apparent physical cause, as well as **illness anxiety disorder**, an unjustified concern over being or becoming ill.

Dissociative Disorders

What disorders create sudden memory loss?

Dissociative disorders involve rare conditions such as **dissociative amnesia**, which involves sudden and severe memory loss, and **dissociative identity disorder (DID)**, or multiple personality disorder, in which a

person appears to have two or more identities. There is considerable controversy about the origins of dissociative identity disorder.

Depressive and Bipolar Disorders

How common is depression?

Depressive disorders are quite common and involve extreme moods that may be inconsistent with events. **Major depressive disorder** is marked by feelings of inadequacy, worthlessness, and guilt; in extreme cases, **delusions** may also occur. **Persistent depressive disorder** includes similar but less severe symptoms that persist for a long period. Suicide is often related to these disorders.

Alternating periods of depression and **mania** characterize **bipolar disorders**; there are more intense manic phases in bipolar I disorder than in bipolar II disorder. These disorders are also known as manic depression. **Cyclothymic disorder**, an alternating pattern of less extreme mood swings, is a slightly more common variant.

Depressive and bipolar disorders have been attributed to biological causes such as genetic inheritance, disruptions in neurotransmitter and endocrine systems, and irregularities in biological rhythms. These factors interact with stressors and psychological factors such as maladaptive patterns of thinking. A predisposition toward some of these disorders may be inherited, although their appearance is probably determined by a diathesis-stress process.

Schizophrenia Spectrum and Other Psychotic Disorders

Is schizophrenia the same as "split personality"?

Schizophrenia is perhaps the most severe and puzzling disorder of all. Among its symptoms are problems in thinking, perception (often including **hallucinations**), attention, emotion, movement, motivation, and daily functioning. Positive symptoms of schizophrenia include hallucinations or disordered speech; negative symptoms can include withdrawal, immobility, and the absence of affect.

Genetic influences, neurotransmitter problems, abnormalities in brain structure and functioning, and neurodevelopmental abnormalities are biological factors implicated in schizophrenia. Psychological factors such as maladaptive learning experiences and disturbed family interactions can affect the severity and course of this disorder. Diathesis-stress explanations, including vulnerability theory, provide a promising framework for research into the multiple causes of schizophrenia.

Personality Disorders

Which personality disorder often leads to crime?

Personality disorders are long-term patterns of maladaptive behavior that create discomfort for the person with the disorder and/or other peoples. These include odd-eccentric types (paranoid, schizoid, and schizotypal personality disorders), anxious-fearful types (dependent, obsessive-compulsive, and avoidant personality disorders), and dramatic-erratic types (histrionic, narcissistic, borderline, and antisocial personality disorders). **Antisocial personality disorder** is marked by impulsive, irresponsible, and unscrupulous behavior patterns that often begin in childhood. Childhood abuse may be related to the appearance of this potentially dangerous personality disorder.

Some Additional Psychological Disorders

How do children's disorders differ from adults' disorders?

Neurodevelopmental disorders seen in childhood can be categorized as externalizing conditions (such as conduct disorders or attention deficit hyperactivity disorder) and internalizing disorders, in which children show overcontrol and experience distress (as in separation anxiety disorder). Some childhood disorders do not fall into either category. In autism spectrum disorder, which can be the most severe of these, children show limitations in their social connections and their use of language.

Substance-related disorders involving alcohol and other drugs affect millions of people. **Addiction** to and psychological dependence on these substances contribute to disastrous personal and social problems, including physical illnesses, accidents, and crime. Genetic factors probably create a predisposition for **alcoholism**, but learning, cultural traditions, and other nonbiological processes

are also important. Stress reduction, imitation, thrill seeking, and social maladjustment have been proposed as important factors in drug addiction, as has genetic predisposition; but the exact causes of initial use of these drugs are unknown.

Mental Illness and The Law

Can insanity protect criminals from punishment?

"Insanity" is a legal term, not a psychiatric diagnosis. Current rules protect people accused of crimes from prosecution or punishment if they are declared mentally incompetent at the time of their trials or if they were legally insane at the time of their crimes. Defendants judged not guilty by reason of insanity and who still display a psychological disorder are usually required to receive treatment until they are judged to be cured or no longer dangerous. Those found guilty but mentally ill are supposed to receive treatment in prison.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. According to the statistics on psychopathology, _____ percent of people in the United States experience a mental disorder in their lifetimes.
 - a. less than 5 percent
 - b. approximately 25 percent
 - c. almost 50 percent
 - d. over 75 percent
2. Babette, a successful opera singer, believes that aliens could snatch her at any time if she isn't wearing her lucky charm. She is constantly worried and insists that the stage be rimmed with foil to ward off evil spirits. According to which criterion of abnormality would Babette *not* be considered abnormal?
 - a. Statistical
 - b. Norm violation
 - c. Practical
 - d. Personal suffering
3. Herman murdered a man who bumped into him in a bar. In order to be found not guilty by reason of insanity, the jury would have to find that he _____.
 - a. was under the influence of alcohol when he committed the crime
 - b. is currently insane
 - c. was insane when he committed the crime
 - d. knew the crime was wrong but did it anyway
4. Roberta and Rhonda are identical twins who inherited identical predispositions for depression. Roberta has lived an easy life and has not developed any depressive symptoms. Rhonda, who has been divorced and lost several jobs over the years, has been diagnosed with major depression. The difference between these twins is most consistent with the _____ approach to abnormality.
 - a. neurobiological
 - b. psychological
 - c. sociocultural
 - d. diathesis-stress
5. Dr. Kramer, an American psychiatrist, is evaluating a patient who came to a hospital for treatment. In his report he indicates that the patient meets all the standard criteria for major depressive disorder. Dr. Kramer is probably using _____ to evaluate the patient.
 - a. the M'Naghten rule
 - b. norm violation criteria
 - c. insanity criteria
 - d. DSM-5
6. Kat stopped going to classes because of worry that she will embarrass herself by saying something silly. She takes her meals to her dorm room so that no one will see her eat. According to the DSM-5, Kat is probably displaying _____.
 - a. agoraphobia
 - b. simple phobia
 - c. generalized anxiety disorder
 - d. social anxiety disorder
7. Terraba had a difficult time driving to work. Every time she went over a bump she had to drive back around to make sure that she had not run over anything. This occurred ten or twelve times each day, so Terraba was always late for everything. Terraba appears to be suffering from _____.
 - a. specific phobia
 - b. panic attacks
 - c. obsessive-compulsive disorder
 - d. generalized anxiety disorder
8. Conversion disorder is characterized by _____.
 - a. impairment of movement or sensory ability with no apparent physical cause
 - b. severe pain with no apparent physical cause
 - c. fear of becoming seriously ill
 - d. frequent, vague complaints of physical symptoms

9. Tomas has been suffering severe back pain for several weeks, but extensive medical tests reveal no physical problem. Tomas appears to be displaying _____.
a. a somatic symptom disorder
b. schizophrenia
c. body dysmorphic disorder
d. obsessive-compulsive disorder
10. When Jennifer, a newspaper reporter, disappeared while covering a crime story that put her under constant threat, everyone assumed she had been kidnapped. But she was found several months later, now married and calling herself Emily, working as a waitress in a city 1,000 miles from her home. She had no memory of her previous life, even after being reunited with her parents. Jennifer would most likely be diagnosed as displaying _____.
a. dissociative amnesia
b. dissociative identity disorder
c. paranoia
d. schizophrenia
11. Over the past three months, Barb has been feeling very sad; she has been sleeping as much as fifteen hours a day and has gained thirty pounds. Debbie, too, feels very low, but she can barely sleep and has lost both her appetite and fifteen pounds. Both Barb and Debbie have symptoms of _____.
a. obsessive-compulsive disorder
b. depression
c. bipolar disorder
d. illness anxiety disorder
12. Suicide is closely tied to depression. Studies of suicide in the United States have found that _____.
a. people who talk about suicide typically don't attempt suicide
b. older males who are living alone are the most likely to commit suicide
c. suicide rates are about the same across ethnic groups and gender
d. depressed women almost never actually attempt suicide
13. Carlisle has been very depressed. He can't face his responsibilities and often spends days at a time in bed. A psychologist who adopts the social-cognitive approach would be most likely to see this depression as caused by Carlisle's _____.
a. attributional style
b. brain chemicals
c. unconscious conflicts
d. blocked growth tendencies
14. As you sit down next to a messy-looking man on a bus, he says, "Ohms vibrate orange and dishwrings obvious dictionary." As he continues talking in this manner, you begin to suspect that he is displaying _____, a _____ symptom of _____.
a. anxiety; negative; obsessive-compulsive disorder
b. delusion; positive; schizophrenia
c. delusion; negative; schizophrenia
d. flat affect; negative; depression
15. Juan can't explain why, but he worries constantly that something terrible is going to happen to him. This vague feeling of impending doom is associated with a diagnosis of _____.
a. conversion disorder
b. specific phobia
c. social phobia
d. generalized anxiety disorder
16. Forty-year-old Richard believes that he was ordered by God to save the world. He is suspicious of other people because he thinks they want to prevent him from fulfilling his mission. He is unable to keep a job because he is angry and argumentative most of the time. Richard would most likely be diagnosed as displaying _____.
a. persistent depressive disorder
b. dissociative identity disorder
c. schizophrenia
d. body dysmorphic disorder
17. Al is charming and intelligent, but he has always been irresponsible, impulsive, and unscrupulous. None of his girlfriends knows he is dating other women. He borrows money from friends and doesn't pay them back. He doesn't care about anyone else, including his family. Al would probably be diagnosed as displaying _____ personality disorder.
a. antisocial
b. narcissistic
c. passive-aggressive
d. inadequate
18. Cathy Widom's research study, discussed in the Focus on Research Methods section of this chapter, found that there was a relationship between antisocial personality disorder and _____.
a. narcissistic personality disorder
b. schizophrenia
c. high intelligence
d. being abused in childhood
19. Angelo drinks alcohol until he passes out. Unable to hold a job or take care of himself, Angelo is diagnosed as having a substance-related disorder. Research on alcoholism suggests that Angelo's problems are caused by _____.
a. a single inherited gene
b. a culture that did not tolerate drinking
c. having parents with alcoholism
d. a combination of genetic and environmental factors
20. Aaron is an infant who shows no signs of attachment to his parents. He dislikes being held and doesn't smile or laugh. Aaron's symptoms are most consistent with _____.
a. infantile schizophrenia
b. autism spectrum disorder
c. antisocial personality disorder
d. an externalizing disorder of childhood

Treatment of Psychological Disorders



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Preview

In old Hollywood movies, such as *The Dark Past* or *The Three Faces of Eve*, troubled people find instant cures when a psychotherapist helps them discover an unconscious memory that holds the key to their psychological disorder. Somewhat more realistic versions of psychotherapy have been presented in movies and television shows such as *Good Will Hunting*, *The Sopranos*, and *In Treatment*. Yet even these portrayals do not convey what psychotherapy is really like, and even the best of them tell only part of the story of how psychological disorders can be treated. In this chapter, we describe a wide range of treatment options, including methods based on psychodynamic, humanistic, behavioral, and biological theories of psychological disorders. We also consider research on the effectiveness of treatment and methods for preventing disorders.

In the chapter on psychological disorders, we described José, an electronics technician who had to take medical leave from his job because of his panic attacks. After four months of diagnostic testing turned up no physical problems, José's physician suggested that he see a psychologist. José resisted at first, insisting that his condition was not "just in his head," but he eventually began psychological treatment. Within a few months, his panic attacks had ceased and José had returned to all his old activities. After the psychologist helped him reconsider his workload, José decided to take early retirement from his job in order to pursue more satisfying work at his home-based computer business.

José's case is common. During any given year in the United States alone, about 15 percent of adults and about 21 percent of children and adolescents are receiving some form of treatment for psychological disorders, including substance use problems (Costello, Copeland, & Angold, 2011; McGorry et al., 2011). In fact, you probably know someone who has received treatment for a psychological disorder (Connor-Greene, 2001). Treatment can be expensive in the short run but saves money in the long run because it typically reduces a person's need for later mental and physical health services (Lambert, 2013). The most common targets of treatment in adults are problems involving anxiety, mood, impulse control, substance abuse, or some combination of these (Kessler & Ustun, 2011). Many people also seek treatment for problems that are not officially diagnosed as disorders, such as relationship conflicts or difficulties associated with grief, divorce, retirement, or other life transitions. The most common treatment targets in children are hyperactivity, oppositional behavior, anxiety, and affective disorders (Phares, 2014).

BASIC FEATURES OF TREATMENT

What features do all treatment techniques have in common?

Psychotherapy is the treatment of psychological disorders through psychological methods. All types of psychotherapy share certain basic features. These common features include a *client* or *patient*, a professionally trained *therapist* or other agent who works to help the client, and a *special therapeutic relationship* between the client and the therapist. In addition, all forms of treatment are based on some *theory* about the causes of the client's problems (Antony & Barlow, 2010). The presumed causes can range from magic spells to infections, and everything in between (Corey, 2008). These theories form the basis of *treatment procedures* for dealing with the client's problems. So traditional healers combat supernatural forces with ceremonies and prayers, medical doctors treat chemical imbalances with medications, and psychologists focus on altering psychological processes through psychotherapy.

People can receive treatment as inpatients or outpatients. *Inpatients* are treated while living in a hospital or other institution. They enter these institutions—voluntarily or

psychotherapy The treatment of psychological disorders through talking and other psychological methods.

Medieval Treatment Methods

Methods used to treat psychological disorders have always been related to the presumed causes of those disorders. In medieval times, when abnormal behavior was associated with demonic possession, physician-priests tried to make the victim's body an uncomfortable place for evil spirits. In this depiction, demons are shown fleeing as an afflicted person's head is placed in an oven.

Stock Montage



involuntarily—because their impairments are severe enough to create a threat to their own well-being or that of others. Depending on their level of functioning, inpatients may stay in the hospital for a few days or weeks or (in rare cases) several years. Their treatment almost always includes prescription medication. *Outpatients* receive psychotherapy and/or prescription medications while living in the community. Outpatients tend to have fewer and less severe symptoms than inpatients and function better in social and occupational situations (Hybels et al., 2008; Pottick et al., 2008).

Those who provide psychological treatment are a diverse group (Robiner, 2006). **Psychiatrists** are medical doctors who complete specialty training in the treatment of mental disorders. Like other physicians, they are authorized to prescribe medication for the relief of psychological problems. **Psychologists** who offer psychotherapy have usually completed a doctoral degree in clinical or counseling psychology, often followed by additional specialized training. Except in Louisiana and New Mexico, and in the U.S. military and the Indian Health Service, psychologists in the United States are not legally authorized to prescribe medication (Heiby, DeLeon, & Anderson, 2008). Other therapy providers include *clinical social workers*, *marriage and family therapists*, and *licensed professional counselors*, all of whom typically hold master's degrees in their respective fields. They provide treatment in many settings, including hospitals, clinics, and private practice. *Psychiatric nurses*, *substance abuse counselors*, members of the clergy working as *pastoral counselors*, and a host of *paraprofessionals* also provide therapy services, often as part of a hospital or outpatient treatment team (Kramer, Bernstein, & Phares, 2014).

The overall goal of treatment is to help troubled people change their thinking, feelings, and behavior in ways that relieve discomfort, promote happiness, and improve functioning as parents, students, employees, and the like. More specific goals and the methods chosen to reach them are included in a treatment plan that the therapist and client develop together. The details of this plan depend on the nature of the client's problems, preferences, financial circumstances, and the time available for treatment (Johnson, 2003). They also depend on the therapist's training and qualifications, theoretical leanings, methodological preferences, and the degree to which the therapist is guided by the results of experimental research on treatment. Let's consider several forms of

psychiatrists Medical doctors who have completed special training in the treatment of mental disorders.

psychologists Among therapists, those with advanced training in clinical or counseling psychology.



Freud's Consulting Room

During psychoanalytic sessions, Freud's patients lay on this couch, free associating or describing dreams and events in their lives, while he sat in the chair behind them. (The couch is now on display at the Freud Museum in London, which you can visit online at www.freud.org.uk.) According to Freud, even apparently trivial actions may carry messages from the unconscious. Forgetting a dream or missing a therapy appointment might reflect a client's unconscious resistance to treatment. Even accidents may be meaningful. Freud might have said that a waiter who spilled hot soup on an older male customer was acting out unconscious aggressive impulses against a father figure.

Geraint Lewis/Alamy

psychotherapy, each of which is based on psychodynamic, humanistic, behavioral, or cognitive behavioral explanations of mental disorder.

Although we describe different approaches in separate sections, keep in mind that the majority of mental health professionals describe themselves as *eclectic* therapists. In other words, they might lean toward one set of treatment methods, but when working with particular clients or particular problems they may employ other methods as well (Lambert, 2013).

PSYCHODYNAMIC PSYCHOTHERAPY

How did Freud get started as a therapist?

The field of formal psychotherapy began in the late 1800s when, as described in the personality chapter, Sigmund Freud established the psychodynamic approach to personality and mental disorders. Freud's method of treatment, **psychoanalysis**, was aimed at understanding unconscious conflicts and how they affect people. Almost all forms of psychotherapy reflect some of Freud's ideas, including (1) his one-to-one treatment method; (2) his search for relationships between an individual's life history and current problems; (3) his emphasis on thoughts, emotions, and motivations in treatment; and (4) his focus on the patient-therapist relationship. We'll describe Freud's original methods first and then consider some more recent treatments that are rooted in his psychodynamic approach.

Classical Psychoanalysis

Classical psychoanalysis developed mainly out of Freud's medical practice. He was puzzled by people who came to him suffering from "hysterical" ailments, such as blindness, paralysis, or other disabilities that had no physical cause (see our discussion of *conversion disorders* in the chapter on psychological disorders). Freud tried to cure these individuals with hypnotic suggestions, but he found this method to be only partially and temporarily successful. Later, he asked hypnotized patients to recall events that might have caused their symptoms. Eventually, however, he stopped using hypnosis and merely had patients lie on a couch and report whatever thoughts, memories, or images came to mind. Freud called this process *free association*.

Freud's "talking cure" produced surprising results. He was struck by how many patients reported memories of childhood sexual abuse, usually by a parent or other close relative (Esterson, 2001). Although these allegations were probably accurate (DeMause, 1987), Freud eventually concluded that his patients' memories of abuse were actually unconscious childhood wishes and fantasies that resulted in hysterical symptoms.

As a result, Freud's psychoanalysis came to focus on an exploration of the unconscious and the conflicts raging within it. Classical psychoanalytic treatment aims first to help troubled people gain *insight* into their problems by recognizing unconscious thoughts and emotions. Then they are encouraged to discover, or *work through*, the many ways in which those unconscious elements continue to motivate maladaptive thinking and behavior in everyday life. The treatment may require as many as three to five sessions per week, usually over several years. Generally, the psychoanalyst is compassionate but emotionally neutral as the patient slowly develops an understanding of how past conflicts influence current problems (Gabbard, 2004).

To gain glimpses of the unconscious—and of the sexual and aggressive impulses he believed reside there—Freud looked for meaning in his patients' free associations, their dreams, their everyday behaviors, and their relationship with him. He believed that hidden beneath the obvious or *manifest content* of dreams is *latent content* that reflects the wishes, impulses, and fantasies that the dreamer's defense mechanisms keep out of consciousness during waking hours. He focused also on what have become known as "Freudian slips" of the tongue and other seemingly insignificant but potentially meaningful behaviors. So if

psychoanalysis A method of psychotherapy that seeks to help clients gain insight into and work through unconscious thoughts and emotions presumed to cause psychological problems.



A Play Therapy Session

Modern versions of psychodynamic treatment include fantasy play and other techniques that make the approach more useful with children. A child's behavior and comments while playing with puppets representing family members, for example, are seen as a form of free association that the therapist hopes will reveal important unconscious material, such as fear of abandonment (Booth & Lindaman, 2000; Carlson, Watts, & Maniacci, 2006). Some therapists encourage child clients to play video games during therapy sessions. This allows them to observe the children's behaviors, draw inferences about their attitudes, and enhance the therapeutic relationship (Ceranoglu, 2010a, 2010b).

AMELIE-BENOIST / BSIP / Alamy

a patient mistakenly used the name of a former girlfriend while talking about his wife, Freud might wonder if the patient unconsciously regretted his marriage. Similarly, when patients expressed dependency, hostility, or even love toward him, Freud saw it as an unconscious process in which childhood feelings and conflicts about parents and other significant people were being transferred to the therapist. Analysis of this *transference*, this “new edition” of the patient’s childhood conflicts and current problems, became another important psychoanalytic method (Gabbard, 2004). Freud believed that focusing on the transference allows patients to see how old conflicts haunt their lives and helps them resolve these conflicts.

Contemporary Variations on Psychoanalysis

Classical psychoanalysis is still practiced, but not as much as it was several decades ago (Kaner & Prelinger, 2007; Wolitzky, 2011). This decline is due in part to the growth of several alternative forms of treatment, including several variations on classical psychoanalysis developed by neo-Freudian theorists (Barber et al., 2013). As noted in the personality chapter, these theorists placed less emphasis than Freud did on the past and on unconscious impulses driven by the id. They focused instead on the role played by social relationships in people’s problems and on how the power of the ego can be harnessed to solve them (Gray, 2005). Psychotherapists who adopt various neo-Freudian treatment methods tend to take a much more active role than classical analysts do, in particular by directing a patient’s attention to evidence of certain conflicts in social relationships.

Many of these methods have come to be known as *short-term psychodynamic psychotherapy* because they aim to provide benefits in far less time than is required in classical psychoanalysis (Levenson, 2003; Messer & Kaplan, 2004; Rawson, 2006). However, virtually all modern psychodynamic therapies still focus attention on unconscious as well as conscious aspects of mental life, on the impact of internal conflicts, and on transference analysis as key elements in treatment (Safran, 2012). In a particularly popular short-term psychodynamic approach known as *object relations therapy*, the powerful need for human contact and support takes center stage (Greenberg & Mitchell, 2006). Object relations therapists believe that most of the problems for which people seek treatment ultimately stem from their relationships with others, especially their mothers or other early caregivers. (The term *object* usually refers to a person who has emotional significance for the client.) Accordingly, these therapists work to create a nurturing relationship in which a person’s problems can be understood and corrected (Kahn & Rachman, 2000; Wallerstein, 2002). This relationship provides a “second chance” to receive the support that might have been missing in infancy and to counteract some of the consequences of maladaptive early attachment patterns. For example, object relations therapists take pains to show that they will not abandon their clients, as might have happened to these people in the past. *Interpersonal therapy* is rooted partly in neo-Freudian theory as well (Sullivan, 1954). Often used in cases of depression, it focuses on helping people explore and overcome the problematic effects of interpersonal events that occur after early childhood, such as the loss of a loved one, conflicts with a parent or a spouse, job loss, or social isolation (e.g., Weissman, Markowitz, & Kierman, 2007).

With their focus on interpersonal relationships rather than instincts, their emphasis on people’s potential for self-directed problem solving, and their reassurance and emotional supportiveness, contemporary variants on classical psychoanalysis have helped the psychodynamic approach retain its influence among some mental health professionals (Barber et al., 2013; Safran, 2012).

HUMANISTIC PSYCHOTHERAPY

Why won't some therapists give advice?

Whereas some therapists revised Freud's ideas, others developed radical new therapies based on the humanistic approach to personality, which we described in the personality chapter. *Humanistic psychologists*, sometimes called *phenomenologists*, view people as capable of consciously controlling their own actions and taking responsibility for their decisions (Schneider & Langle, 2012). Most humanistic therapists believe that human behavior isn't motivated by inner conflicts but by an innate drive toward growth that is guided by the way people perceive their world. Disordered behavior, they say, reflects a blockage in natural growth brought on by distorted perceptions or lack of awareness about feelings. Accordingly, humanistic therapy operates on the following assumptions:

1. Treatment is an encounter between equals, not a "cure" given by an expert. It's a way to help clients restart their natural growth and feel and behave in more genuine ways.
2. Clients will improve on their own, given the right therapeutic conditions. These ideal conditions promote clients' awareness, acceptance, and expression of their feelings and perceptions.
3. Ideal conditions in therapy can best be established through a therapeutic relationship in which clients are made to feel accepted and supported as human beings, no matter how problematic or undesirable their behavior may be. The client's experience of this relationship brings beneficial changes. (Notice that this assumption is shared with object relations and some other forms of brief psychodynamic therapy.)
4. Clients must remain responsible for choosing how they will think and behave.

Of the many humanistically oriented treatments in use today, the most influential are *client-centered therapy*, developed by Carl Rogers (1951), and *Gestalt therapy*, developed by Frederick and Laura Perls.

Client-Centered Therapy

Carl Rogers was trained in psychodynamic therapy methods during the 1930s, but he soon began to question their value. He especially disliked being a detached expert whose task is to "figure out" the client. Eventually convinced that a less formal approach would be more effective, Rogers allowed his clients to decide what to talk about, and when, without direction, judgment, or interpretation by the therapist (Raskin & Rogers, 2005). This approach, now called **client-centered therapy** or **person-centered therapy**, relies on the creation of a relationship that reflects three intertwined therapist attitudes: unconditional positive regard, empathy, and congruence.

Unconditional Positive Regard

The attitude Rogers called **unconditional positive regard** consists of treating the client as a valued person, no matter what. This attitude is communicated through the therapist's willingness to listen without interrupting and to accept what is said without evaluating it. The therapist doesn't have to approve of everything the client says or does but must accept it as reflecting that client's view of the world. Because Rogerian therapists trust clients to solve their own problems, they rarely give advice (Merry & Brodley, 2002). Doing so, said Rogers, would send clients an unspoken message that they are incompetent, making them less confident and more dependent on help.

Empathy

In addition, client-centered therapists try to see the world as the client sees it. In other words, the therapist tries to develop **empathy**, an emotional understanding of what the

client-centered therapy (person-centered therapy) A type of therapy in which the client decides what to talk about, and when, without direction, judgment, or interpretation from the therapist.

unconditional positive regard In client-centered therapy, the therapist's attitude that expresses caring for and acceptance of the client as a valued person.

empathy In client-centered therapy, the therapist's attempt to appreciate how the world looks from the client's point of view.



Client-Centered Therapy

Carl Rogers believed that people in successful client-centered therapy become more self-confident, more aware of their feelings, more accepting of themselves, more comfortable and genuine with other people, more reliant on self-evaluation than on the judgments of others, and more effective and relaxed.

Bettmann/Corbis

client might be thinking and feeling. Like other skillful interviewers, they engage in active listening—making eye contact with the client, nodding in recognition as the client speaks, and giving other signs of careful attention. They also use *reflection*, a paraphrased summary of the client’s words that emphasizes the feelings and meanings that appear to go along with them. Reflection confirms that the therapist has understood what the client has said, conveys the therapist’s interest in hearing it, and helps the client to be more aware of the thoughts and feelings being expressed. Here is an example:

Client: This has been such a bad day. I’ve felt ready to cry any minute, and I’m not even sure what’s wrong!

Therapist: You really do feel so bad. The tears just seem to well up inside, and I wonder if it is a little scary to not even know why you feel this way.

Notice that, in rephrasing the client’s statements, the therapist reflected back not only the obvious feelings of sadness but also the fear in the client’s voice. Most clients respond to empathic reflection by elaborating on their feelings. This client went on to say, “It is scary, because I don’t like to feel in the dark about myself. I have always prided myself on being in control.”

Empathic listening tends to be so effective in promoting self-understanding and awareness that it is used across a wide range of therapies (Corsini & Wedding, 2005). Even beyond the realm of therapy, people who are thought of as easy to talk to are usually “good listeners” who reflect back the important messages they hear from others.

Congruence

Rogerian therapists also try to convey **congruence** (sometimes called *genuineness*) by acting in ways that are consistent with their feelings during therapy. For example, if they are confused by what a client has said, they say so instead of trying to pretend that they always understand everything. When the therapist’s unconditional positive regard and empathy are genuine, the client is able to see that relationships can be built on openness and honesty. Ideally, this experience will help the client become more congruent, or genuine, in other relationships.

Gestalt Therapy

Another form of humanistic treatment was developed by Frederick S. (Fritz) Perls and his wife, Laura Perls. A European psychoanalyst, Frederick Perls was greatly influenced by Gestalt psychology, which focused on the idea that people actively organize their perceptions of the world. As a result, he believed that (1) people create their own versions of reality; and (2) people’s natural psychological growth continues only as long as they perceive, remain aware of, and act on their true feelings. Growth stops and symptoms of mental disorder appear, said Perls, when people are not aware of all aspects of themselves (Perls, 1969; Perls, Hefferline, & Goodman, 1951).

Like client-centered therapy, **Gestalt therapy** seeks to create conditions in which clients can become more unified, self-aware, and self-accepting and thus ready to grow again. However, Gestalt therapists use more direct and dramatic methods than do Rogerians. Often working with groups, Gestalt therapists prod clients to become aware of feelings and impulses that they have disowned and to discard feelings, ideas, and values that are not really their own. For example, the therapist or other group members might point out inconsistencies between what clients say and how they behave. Gestalt therapists pay particular attention to clients’ gestures and other forms of “body language” that appear to conflict with what the clients are saying (Kepner, 2001). The therapist may also ask clients to engage in imaginary dialogues with other people, with parts of their own personalities, and even with objects (Elliott, Watson, & Goldman, 2004a, 2004b). Like a shy person who can be socially outgoing only while at a costume party, clients often find that these dialogues help them get in touch with and express their feelings (Woldt & Toman, 2005).

congruence In client-centered therapy, a consistency between the way therapists feel and the way they act toward clients.

Gestalt therapy An active form of humanistic treatment that seeks to create conditions in which clients can become more unified, more self-aware, and more self-accepting.



Existential Therapy

Additional forms of humanistic therapy were developed by Rollo May (1969), Viktor Frankl (1963), and Irwin Yalom (1980). Their methods were based on existential philosophy, which highlights such uniquely human concerns as our freedom to choose our actions, being responsible for those actions, feeling alone in the world, trying to find meaning and purpose in our lives, and confronting the prospect of death (Yalom, 2002). *Existential therapy* is designed to help people accept and deal with these concerns head-on rather than to continue ignoring or avoiding them. Because people can feel lost, alone, and unsure of life's meaning without displaying serious behavior problems, existential therapists consider their approach as applicable to anyone, whether officially diagnosed with some form of mental disorder or not.

Ziggy Kaluzny/Stone/Getty Images

Over the years, client-centered and other forms of humanistic therapy have declined in popularity (Watson, 2011), but Carl Rogers's contributions to psychotherapy remain significant and influential (Cook, Biyanova, & Coyne, 2009). In particular, many other treatment approaches have incorporated his emphasis on the importance of the therapeutic relationship in bringing about change (Elliott et al., 2013). Gestalt therapy, too, remains on the therapy scene; some psychologists now combine Perls's techniques with concepts from Eastern philosophy to help clients develop greater self-awareness and self-acceptance (Barnard & Curry, 2011; Schanche et al., 2011).

BEHAVIOR THERAPY AND COGNITIVE BEHAVIOR THERAPY

Can we learn to conquer fears?

Psychodynamic and humanistic approaches to therapy assume that if clients gain insight or self-awareness about underlying problems, the symptoms created by those problems will disappear. Behavior therapists emphasize a different kind of self-awareness: they help clients think about psychological problems as *learned behaviors* that can be changed without first searching for hidden meanings or unconscious causes (Miltenberger, 2011; Spiegler & Guevremont, 2009). For example, suppose you have a panic attack every time you leave home and find relief only when you return. Making excuses when friends invite you out temporarily eases your anxiety but does nothing to solve the problem. Could you reduce your fear without first searching for its underlying meaning? Behavior therapists say yes. So instead of focusing on the possible meaning of your anxiety, they would begin by helping you identify the learning principles that have served to create and maintain it. They would then guide you in learning more adaptive responses in anxiety-provoking situations.

These goals are based on the behavioral approach to psychology in general and on the social-cognitive approach to personality and disorder in particular. As described in the personality chapter, social-cognitive theorists see learning as the basis of both normal personality and most behavior disorders. According to this perspective, disordered behavior and thinking are examples of the maladaptive actions and thoughts that the client has developed through the processes described in the chapter on learning. For example, behavior therapists believe that fear of being in open spaces, in crowds, or away from home (agoraphobia) stems from classically conditioned associations between being away from home and having panic attacks. The problem is partly maintained, they say, through operant conditioning: Staying home and making excuses for doing so is rewarded by reduced anxiety.

Some behavior therapists also emphasize that fears and other problems are maintained by what we think about situations and about ourselves. As discussed later, these *cognitive behavior* therapists focus their treatment efforts on changing maladaptive thoughts as well as problematic behaviors. In short, behavior therapists believe that if problems can be created through prior learning experiences, they can be eliminated through new learning experiences. So whether phobias and other problems are based on events in childhood or were learned more recently, behavior therapists address them by arranging for their clients to have beneficial new experiences.

The notion of applying learning principles in order to change troublesome overt behavior has its roots in the work of John B. Watson, Ivan Pavlov, and others who studied the learned nature of fear in the 1920s. It also stems from B. F. Skinner's research on the impacts of reward and punishment on behavior. In the late 1950s and early 1960s, researchers began to use classical conditioning, operant conditioning, and observational learning techniques in a systematic way to create treatment programs designed to eliminate fears, improve the behavior of disruptive schoolchildren and mental patients, and deal with many other problems (Fishman, Rego, & Muller, 2011). By 1970, behavioral treatment had

become a popular alternative to psychodynamic and humanistic methods (Miltenberger, 2011). The most notable features of behavioral treatment include the following:

1. Development of a productive therapist-client relationship. As in other therapies, this relationship enhances clients' confidence that change is possible and makes it easier for them to speak openly and to cooperate in and benefit from treatment (Emmelkamp, 2013).
2. A careful listing of the behaviors and thoughts to be changed (Umbreit et al., 2006). This assessment and the establishment of specific treatment goals sometimes replace the formal diagnosis used in some other therapy approaches. So, instead of treating "depression" or "obsessive-compulsive disorder," behavior therapists work to change the specific thoughts, behaviors, and emotional reactions that lead people to receive these diagnostic labels.
3. A therapist who acts as a teacher/assistant by providing learning-based treatments, giving "homework" assignments, and helping the client make specific plans for dealing with problems rather than just talking about them (Kazantzis et al., 2010).
4. Continuous monitoring and evaluation of treatment, and constant adjustments to any procedures that do not seem to be effective (Farmer & Nelson-Gary, 2005). Because ineffective procedures are soon altered or abandoned, behavioral treatment tends to be one of the briefer forms of therapy.

Behavioral treatment can take many forms. By tradition, those that rely mainly on classical conditioning principles are usually referred to as **behavior therapy**. Those that focus on operant conditioning methods are usually called **behavior modification**, or *applied behavior analysis* (Miltenberger, 2011). Behavioral treatment that focuses on changing thoughts as well as overt behaviors is called **cognitive behavior therapy**. These methods, especially cognitive behavior therapy, have become increasingly influential in recent years (Hollon & Beck, 2013; Schueller, Muñoz, & Mohr, 2013). Newer cognitive behavior therapies, such as *acceptance and commitment therapy (ACT)* and *mindfulness training*, have a history in alternative medicine and are supported by a strong evidence base (Dimidjian & Linehan, 2009; Hayes & Lillis, 2014; Swain et al., 2013).

Techniques for Modifying Behavior

LINKAGES Can people learn their way out of a disorder? (a link to Learning)

behavior therapy Treatments that use classical conditioning principles to change behavior.

behavior modification Treatments that use operant conditioning methods to change behavior.

cognitive behavior therapy Learning-based treatment methods that help clients change the way they think as well as the way they behave.

systematic desensitization therapy A behavioral method for treating anxiety in which clients visualize a graduated series of anxiety-provoking stimuli while remaining relaxed.

The most commonly used behavioral treatment methods include *systematic desensitization therapy*, *modeling*, *positive reinforcement*, *extinction*, *aversion conditioning*, and *punishment*.

Systematic Desensitization Therapy

Joseph Wolpe (1958) developed one of the first behavioral methods for helping clients to overcome phobias and other forms of anxiety. In his **systematic desensitization therapy**, the client remains relaxed while visualizing a series of anxiety-provoking stimuli. Wolpe believed that this process gradually weakens the learned association between anxiety and the feared object until the fear disappears.

Wolpe first helped his clients learn to relax, often using the *progressive relaxation training* procedures described in the chapter on health, stress, and coping. While relaxed, clients would be asked to imagine the easiest item on a *desensitization hierarchy*, a list of increasingly fear-provoking situations. As treatment progressed, clients imagined each item in the hierarchy, one at a time, moving to a more difficult item only after learning to imagine the previous one without distress. For example, a client who feared flying might begin by imagining airline ads in the newspaper, then imagine people on a TV show boarding an airliner, then imagine boarding a flight, being seated during takeoff, and so on. Wolpe found that once clients could remain calm as they imagined being in feared situations, they were better able to deal with those situations in real life later on.



Virtual Desensitization

This client fears spiders. She is wearing a virtual reality display that, under the therapist's careful control, creates the visual experience of seeing spiders of various sizes at varying distances. After learning to tolerate these realistic images without anxiety, clients are better able to fearlessly face the situations they once avoided.

Thierry Berrod/Mona Lisa Production/Science Source

It turns out, though, that desensitization can be especially effective when it slowly and carefully presents clients with real, rather than imagined, hierarchy items (e.g., Choy, Fyer, & Lipsitz, 2007; Tryon, 2005). This *in vivo*, or “real life,” desensitization was once difficult to arrange or control, especially in treating fear of heights, highway driving, or flying, for example. Today, however, *virtual reality graded exposure* makes it possible for clients to “experience” vivid, precisely graduated versions of feared situations without actually being exposed to the real thing. In one early study of this approach, clients who feared heights wore a virtual reality helmet that gave the impression of standing on bridges of gradually increasing heights, on outdoor balconies on higher and higher floors, and in a glass elevator as it slowly rose forty-nine stories (Rothbaum et al., 1995). The same virtual reality technology has been used successfully in the treatment of fears caused by

spiders, dentistry, air travel, social interactions, public speaking, and posttraumatic stress disorder (e.g., North, North, & Burwick, 2008; Powers et al., 2010; Rothbaum, 2006; Safir & Wallach, 2012; Winerman, 2005).

Modeling

In **modeling** treatments, clients learn important skills by watching other people perform desired behaviors (Bidwell & Rehfeldt, 2004). For example, modeling can teach fearful clients how to respond fearlessly and confidently. In one case study, a therapist showed a spider-phobic client how to calmly kill spiders with a fly swatter and then assigned her to practice this skill at home with rubber spiders (MacDonald & Bernstein, 1974). This combination of fearless demonstrations and firsthand practice, called *participant modeling*, is one of the most powerful treatments for fear (e.g., Bandura, Blanchard, & Ritter, 1969; Zimbarg & Griffith, 2008).

Modeling is also a major part of *assertiveness training* and *social skills training*, which help clients learn how to deal with people more comfortably and effectively. Social skills training has been used to help children interact more effectively with peers, to help social-phobic singles make conversation on dates, to reduce loneliness in adults, and to help rebuild mental patients' ability to have normal conversations with people outside a hospital setting (e.g., Lin et al., 2008; Masi et al., 2011). In **assertiveness training**, the therapist helps clients learn to express their feelings and stand up for their rights in social situations (Alberti & Emmons, 2008). So instead of sheepishly agreeing to be seated at an undesirable restaurant table, clients learn to be comfortable making “I-statements,” such as “I would rather sit over there, by the window.” Notice that *assertiveness* does not mean aggressiveness; instead, it involves clearly and directly expressing both positive and negative feelings and standing up for one's own rights while respecting the rights of others (Alberti & Emmons, 2008; Patterson, 2000). Assertiveness training is often done in groups and involves both modeling and role playing of specific situations (Duckworth, 2009). For example, group assertiveness training has helped wheelchair-bound adults and students with learning disabilities to more comfortably handle the socially awkward situations in which they sometimes find themselves (Eamon, 2008).

Positive Reinforcement

Behavior therapists also use **positive reinforcement** to alter problematic behaviors and teach new skills in cases ranging from childhood tantrums and juvenile delinquency to schizophrenia and substance abuse (Lussier et al., 2006; Virués-Ortega, 2010). Employing operant conditioning principles, they set up *contingencies*, or rules, that specify the behaviors to be strengthened through reinforcement. In one pioneering study, children with autistic disorder, who typically speak very little, were given grapes, popcorn, or other

modeling A behavior therapy method in which desirable behaviors are demonstrated for clients.

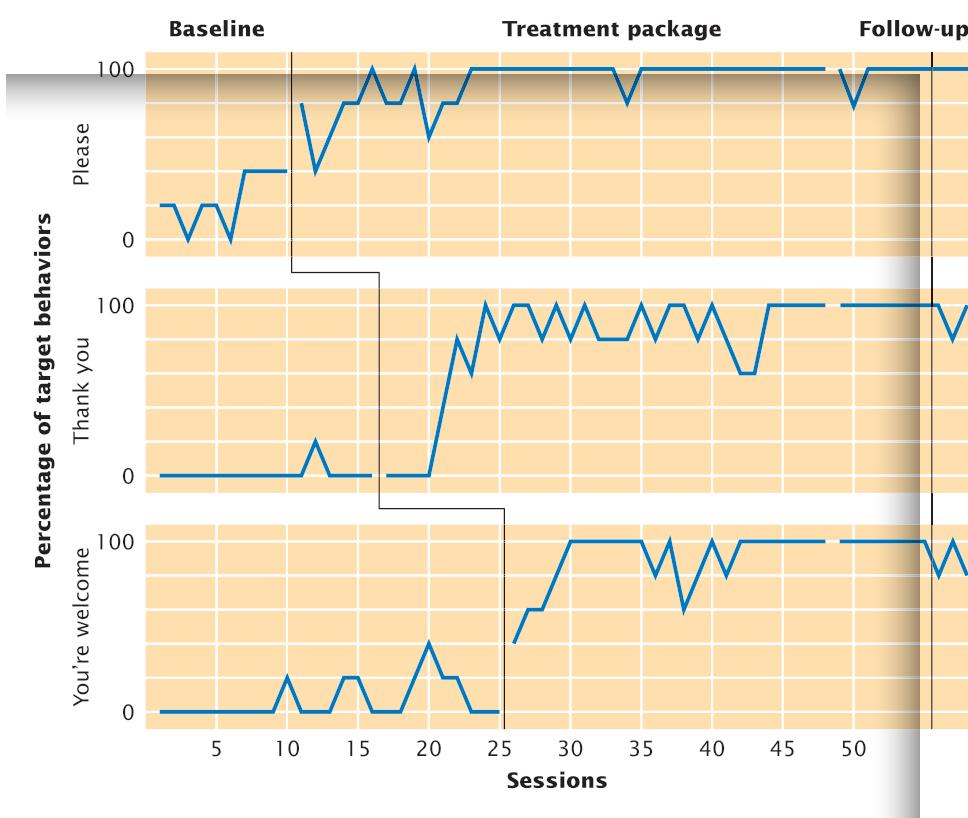
assertiveness training A set of methods for helping clients learn to express their feelings and stand up for their rights in social situations.

positive reinforcement Presenting a positive reinforcer (reward) after a desired response.

FIGURE 15.1

Positive Reinforcement for a Child with Autistic Disorder

During each pretreatment baseline period, a child with autistic disorder rarely said “please,” “thank you,” or “you’re welcome,” but he began to make such statements once the therapist demonstrated them, then reinforced the child for saying them. Did modeling and reinforcement actually cause the change? Probably, because each type of response did not start to increase until the therapist began demonstrating it.



items they liked in return for saying “please,” “thank you,” and “you’re welcome” while exchanging crayons and blocks with a therapist. After the therapist modeled the desired behavior by saying the appropriate words at the appropriate times, the children began to say these words on their own. Their use of language also began to appear in other situations, and, as shown in Figure 15.1, the new skills were still evident six months later (Matson et al., 1990).

When working with severely disturbed or intellectually disabled clients in institutions or with juveniles who display emotional or behavioral disorders in residential facilities, behavior therapists sometimes establish a **token economy program**, which is a system for reinforcing desirable behaviors with points or coinlike tokens that can be exchanged later for snacks, access to television, or other rewards (Kazdin, 2008; Matson & Boisjoli, 2009). The goal is to shape more adaptive behavior patterns that will continue outside the institution (Miltenberger, 2011).

Extinction

Just as reinforcing desirable behaviors can make them more likely to occur, failing to reinforce undesirable behaviors can make them less likely to occur, a process known as **extinction**. Treatment methods that use extinction change behavior slowly but offer a valuable way of reducing inappropriate behavior in children and adolescents and in intellectually disabled or seriously disturbed adults (Xue et al., 2012). For example, a client who gets attention by disrupting a classroom, damaging property, or violating hospital rules might be placed in a quiet, boring “time out” room for a few minutes to eliminate reinforcement for misbehavior (Kaminski et al., 2008; Kazdin, 2008).

Extinction can also reduce some learned fears (e.g., Liu et al., 2014), forming the basis of a fear-reduction treatment called **flooding**, in which clients are kept in a feared but harmless situation and are not permitted to use their normally rewarding escape strategies (O’Donohue, Fisher, & Hayes, 2003). **Implosive therapy** is a related method in which the therapist helps the client to vividly imagine being in the feared situation

token economy program A system for improving the behavior of clients in institutions by rewarding desirable behaviors with tokens that can be exchanged for various rewards.

extinction The gradual disappearance of a conditioned response.

flooding An exposure technique for reducing anxiety that keeps a client in a feared but harmless situation.

implosive therapy An exposure technique in which clients are helped to imagine being kept in a feared but harmless situation.



Treating Fear through Flooding

Flooding is designed to extinguish anxiety by allowing it to occur without the harmful consequences the person dreads. These clients' fear of flying is obvious here, just before takeoff, but it is likely to diminish during and after an uneventful flight. Like other behavioral treatments, flooding is based on the idea that phobias and other psychological disorders are learned and can thus be "unlearned." Some therapists prefer more gradual exposure methods similar to those of in vivo desensitization, which start with situations that are lower on the client's fear hierarchy (Back et al., 2001; Fava et al., 2001).

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by describing it at length and in great detail. A client undergoing flooding or implosive therapy might be overwhelmed with fear at first, but after an extended period of exposure to the feared stimulus (a frog, say) without experiencing pain, injury, or any other dreaded result, the association between the feared stimulus and the fear response gradually weakens and the conditioned fear response is extinguished (Hauner et al., 2012; Öst et al., 2001; Powers et al., 2010). In one early study, twenty clients who feared needles were exposed for two hours to the sight and feel of needles, including by having mild finger pricks, harmless injections, and blood samplings (Öst, Hellström, & Kåver, 1992). Afterward, all but one of these clients were able to have a blood sample drawn without experiencing significant anxiety.

Because they continuously expose clients to feared stimuli, flooding and other similar methods are also

known as *exposure techniques*. Although often highly effective, these methods do cause considerable distress, much like immediately exposing a fearful client to the most difficult item on a desensitization hierarchy. Therefore, some therapists prefer more gradual exposure therapy methods, especially when treating fear that is not focused on a specific stimulus (Berry, Rosenfield, & Smits, 2009).

Aversion Therapy

Some unwanted behaviors, such as excessive gambling or using addictive drugs, can become so habitual and temporarily rewarding that they must be made less attractive if a client is to have any chance of giving them up. Methods for reducing the appeal of certain stimuli are known as *aversion therapy*. The name reflects the fact that these methods rely on a classical conditioning process called **aversion conditioning** to associate shock, nausea, or other physical or psychological discomfort with undesirable stimuli, thoughts, or actions (e.g., Bordnick et al., 2004).

Because aversion conditioning is unpleasant and uncomfortable, because it may not work with all clients (Flor et al., 2002), and because its effects are often temporary, most behavior therapists use this method relatively rarely, only when it is the best treatment choice, and only long enough to allow the client to learn more appropriate alternative behaviors.

Punishment

Sometimes the only way to eliminate a dangerous or disruptive behavior is to punish it with an unpleasant but harmless stimulus, such as a shouted "No!" or a mild electric shock. Unlike aversion conditioning, in which the unpleasant stimulus occurs along with the behavior that is to be eliminated (a classical conditioning approach), **punishment** is an operant conditioning technique; it presents the unpleasant stimulus *after* the undesirable behavior occurs.

Before using electric shock or other forms of punishment, behavior therapists are required by ethical and legal guidelines to ask themselves several important questions: Have all other methods failed? Would the client's life be in danger without treatment? Has an ethics committee reviewed and approved the procedures? Has the adult client or a child client's parent or guardian agreed to the treatment (Kazdin, 2008)? When the answer to these questions is yes, punishment can be an effective, sometimes life-saving, treatment—as in the case illustrated in Figure 5.12 in the chapter on learning. Like extinction and aversion conditioning, though, punishment works best when it is used just long enough to eliminate undesirable behavior and is combined with other behavioral methods designed to reward more appropriate behavior (Hanley et al., 2005).

aversion conditioning A method for reducing unwanted behaviors by using classical conditioning principles to create a negative response to some stimulus.

punishment The presentation of an aversive stimulus or the removal of a pleasant one following some behavior.

Cognitive Behavior Therapy

Like psychodynamic and humanistic therapists, most behavior therapists recognize that depression, anxiety, and many other behavior disorders can stem from how clients think about themselves and the world. And like other therapists, most behavior therapists try to change clients' troublesome ways of thinking, not just their overt behavior. Unlike other therapists, however, behavior therapists rely on learning principles to help clients change the way they think. Their methods are known collectively as *cognitive behavior therapy* (Hollon & Beck, 2013). Suppose, for example, that a client has good social skills but suffers intense anxiety around other people. In a case like this, social skills training would obviously be unnecessary. Instead, the behavior therapist would use cognitive behavioral methods designed to help the client identify habitual thoughts (such as "I shouldn't draw attention to myself") that create awkwardness and discomfort in social situations. Once these cognitive obstacles are brought to light, the therapist describes new and more adaptive ways of thinking and encourages the client to learn and practice them. As these cognitive skills develop (e.g., "I have as much right to give my opinion as anyone else"), it becomes easier and more rewarding for clients to let these new thoughts guide their behavior (Beck, 2005). Cognitive behavior therapy approaches such as these are increasingly common and influential in psychological treatment (Hollon & Beck, 2013; Hayes & Lillis, 2014).

Rational-Emotive Behavior Therapy

A prominent form of cognitive behavior therapy is **rational-emotive behavior therapy (REBT)**, developed by Albert Ellis (1962, 2014). REBT aims first at identifying unrealistic and self-defeating thoughts, such as "I must be loved or approved of by everyone" or "I must always be competent to be worthwhile." After the client learns to recognize such thoughts and to see how they can cause problems, the therapist uses suggestions, encouragement, and logic to help the client replace maladaptive thoughts with more realistic and beneficial ones. The client is then given "homework" assignments to try these new ways of thinking in everyday situations. Here is part of an REBT session with a woman who suffered from panic attacks. She has just said that it would be "terrible" if she had an attack in a restaurant and that people "should be able to handle themselves!"

Therapist: The reality is that ... "shoulds" and "musts" are the rules that other people hand down to us, and we grow up accepting them as if they are the absolute truth, which they most assuredly aren't.

Client: You mean it is perfectly okay to, you know, pass out in a restaurant?

Therapist: Sure!

Client: But ... I know I wouldn't like it to happen.

Therapist: I can certainly understand that. It would be unpleasant, awkward, inconvenient. But it is illogical to think that it would be terrible, or ... that it somehow bears on your worth as a person.

Client: What do you mean?

Therapist: Well, suppose one of your friends calls you up and invites you back to that restaurant. If you start telling yourself, "I might panic and pass out and people might make fun of me and that would be terrible," ... you might find you are dreading going to the restaurant, and you probably won't enjoy the meal very much.

Client: Well, that is what usually happens.

Therapist: But it doesn't have to be that way.... The way you feel, your reaction ... depends on what you choose to believe or think, or say to yourself. (Masters et al., 1987)

Cognitive behavior therapists use many techniques related to REBT to help clients learn to think in more adaptive ways (e.g., Lang et al., 2012; Lau et al., 2011;

rational-emotive behavior therapy (REBT) A treatment designed to identify and change illogical, self-defeating thoughts that lead to anxiety and other symptoms of disorder.



Albert Ellis

Rational-emotive behavior therapy (REBT) focuses on altering the self-defeating thoughts that Ellis believed underlie people's behavior disorders. Ellis argued, for example, that students do not get upset because they fail a test but because they have learned to believe that failure is a disaster that indicates they are worthless. Many of Ellis's ideas have been incorporated into various forms of cognitive behavior therapy, and they helped Ellis himself to deal rationally with the health problems he encountered prior to his death in 2007 (Ellis, 1997).

Jim Kahnweiler/jimkphotographics.com

Macleod & Mathews, 2012). Techniques aimed at replacing upsetting thoughts with alternative thinking patterns are described by behaviorists as *cognitive restructuring* (Dobson & Hamilton, 2009). They help clients plan calming thoughts to use during exams, tense conversations, and other anxiety-provoking situations. These thoughts might include "OK, stay calm, you can handle this. Just focus on the task, and don't worry about being perfect." Sometimes, these techniques are expanded to include *stress inoculation training*, in which clients imagine being in a stressful situation and then practice newly learned cognitive skills to remain calm (Meichenbaum, 2009; Sheehy & Horan, 2004).

Beck's Cognitive Therapy

Behavior therapists seek a different kind of cognitive restructuring when they use Aaron Beck's **cognitive therapy** (Beck, 1976, 1995, 2005, 2011; Clark & Beck, 2012). Beck's treatment approach is based on the idea that certain psychological problems—especially those related to depression and anxiety but also those related to personality disorders and schizophrenia (Beck et al., 2007; Beck et al., 2008)—can be traced partly to errors in logic and false beliefs. These include *catastrophizing* (e.g., "If I fail my driver's test the first time, I'll never pass it, and that'll be the end of my social life"), *all-or-none thinking* (e.g., "Everyone ignores me"), and *personalization* (e.g., "I know those people are laughing at me"). Beck refers to these errors and beliefs as *cognitive distortions* (Beck, Freeman, & Davis, 2007). They occur so quickly and automatically that the client never stops to consider that they might not be true (see Table 15.1).

Cognitive therapy takes an active, organized, problem-solving approach in which therapists first help clients learn to identify the errors in logic, false beliefs, and other cognitive distortions that precede anxiety, depression, conduct problems, eating disorders, and other psychological problems (Hollon & Beck, 2013). Then, much as in the five-step critical thinking system illustrated throughout this book, these thoughts and beliefs are considered as hypotheses to be tested, not as "facts" to be uncritically accepted (Hollon & DiGiuseppe, 2011). In other words, the therapist and client become a team of "investigators" as they plan ways to test beliefs such as "I'm no good around the house." For example, they might agree on tasks that the client will attempt as "homework"—such as cleaning the basement, hanging a picture, or cutting the grass. Success at accomplishing even one of these tasks provides concrete evidence to challenge a false belief about incompetence that has supported feelings of depression or anxiety, thus helping to reduce them (Beck et al., 1992; Mullin, 2000).

As described in the chapter on psychological disorders, however, depression, anxiety, and some other disorders may not entirely be due to specific thoughts or beliefs about specific situations. Sometimes they stem from a more general cognitive style that leads

TABLE 15.1 SOME EXAMPLES OF NEGATIVE THINKING

TRY THIS

cognitive therapy An organized problem-solving approach in which the therapist actively collaborates with clients to help them notice how certain negative thoughts precede anxiety and depression.

Here are a few examples of the kinds of thoughts that cognitive behavior therapists believe underlie anxiety, depression, and other behavior problems. After reading this list, try writing an alternative thought that clients could use to replace each of these ingrained cognitive habits. Then jot down a "homework assignment" that you would recommend to help clients challenge each maladaptive statement and thus develop new ways of thinking about themselves.

"I shouldn't draw attention to myself."
 "I will never be any good at this."
 "It will be so awful if I don't know the answer."
 "Everyone is smarter than I am."
 "Nobody likes me."
 "I should be able to do this job perfectly."
 "What if I panic?"
 "I'll never be happy."
 "I should have accomplished more by this point in my life."



A Circle of Friends

Some of the advantages of group therapy are also applied in *self-help* groups for problems such as alcohol and drug addiction, childhood sexual abuse, cancer, overeating, overspending, bereavement, compulsive gambling, and schizophrenia (Humphreys, 2004; Kurtz, 2004). Hundreds of thousands of local chapters enroll 10 to 15 million participants in the United States and about half a million in Canada (Harwood & L'Abate, 2010). Some participants meet solely on the Internet (Tan, 2008; Tillfors et al., 2008).

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people to expect that the worst will always happen to them and to assume that negative events occur because they are completely and permanently incompetent and worthless (Beck & Alford, 2009). So cognitive behavior therapists also work with clients to develop more generally optimistic ways of thinking and to reduce their tendency to blame themselves for negative outcomes (Persons, Davidson, & Tompkins, 2001). In some cases, cognitive restructuring is combined with skill training, techniques for managing anxiety, and practice in using logical thinking, all of which are designed to help clients experience success and develop confidence in situations in which they had previously expected to fail (Bryant et al., 2008).

Some cognitive therapists have also encouraged clients to use traditional Eastern practices such as meditation (see the chapter on consciousness) to help monitor problematic thoughts. This combined approach is called *mindfulness-based cognitive therapy* (Hofmann et al., 2010; Ma & Teasdale, 2004). It has been helpful in cases of depression (Meadows et al., 2014) and in helping to prevent relapse in people battling substance use disorders (Bowen et al., 2014; Witkiewitz et al., 2014). Research in the field of positive psychology suggests that the effects of cognitive behavior therapy may be enhanced through exercises designed to promote positive emotions—such as identifying and using personal strengths and making a list of things that have gone well each day (Seligman, Berkowitz, et al., 2005; Seligman, Rashid, & Parks, 2006).

GROUP, FAMILY, AND COUPLES THERAPY

How does group psychotherapy differ from individual therapy?

The one-on-one methods of psychodynamic, humanistic, and behavioral treatment we have described are often adapted for use with groups of clients or with family units (Burlingame, Strauss, & Joyce, 2013; Kaslow, 2011).

Group Psychotherapy

Group psychotherapy refers to the treatment of several clients under the guidance of a therapist who encourages helpful interactions among group members. Many groups are organized around one type of problem (such as alcoholism) or one type of client (such as adolescents). In most cases, six to twelve clients meet with their therapist at least once a week for about two hours. All group members agree to hold confidential everything that occurs within these sessions.

Group psychotherapy offers features that are not found in individual treatment (Burlingame, Strauss, & Joyce, 2013). First, it allows the therapist to observe clients interacting with one another. Second, groups encourage their members to talk about themselves and explore their feelings. As they listen to each other, clients often feel less alone because they realize that other people are struggling with difficulties they can relate to as well. This realization tends to raise each client's expectations for improvement, a factor that is important in all forms of treatment. Third, group members can boost one another's self-confidence and self-acceptance as they come to trust and value one another. Fourth, clients learn from one another. They share ideas for solving problems and give one another honest feedback about their attitudes and behavior. Fifth, perhaps through mutual modeling, the group experience makes clients more sensitive to other people's needs, motives, and messages. Finally, group psychotherapy allows clients to try out new skills in a supportive environment. So although the procedures and techniques employed in group psychotherapy may reflect one or more of the theoretical orientations we have described in relation to individual therapy (Burlingame, Strauss, & Joyce, 2013), the impact of the treatment is thought to be enhanced by the nature and strength of the group itself.

group psychotherapy Psychotherapy involving six to twelve unrelated individuals.

family therapy A type of treatment involving two or more clients from the same family.

couples therapy A form of therapy that focuses on improving communication between partners.



- Always begin with something positive when stating a problem.
- Maintain a focus on the present or the future; don't review all previous examples of the problem or ask "why" questions such as "Why do you always...?"
- Talk about observable events; don't make inferences about them (e.g., say "I get angry when you interrupt me" rather than "Stop trying to make me feel stupid").

FIGURE 15.2
Some "Rules for Talking" in Couples Therapy

TRY THIS Many forms of couples therapy help partners improve communication by establishing rules such as the ones listed here. Think about your own experience in relationships or your observations of heterosexual or homosexual couples as they interact, and then write down some rules you would add to this list. Why do you think it would be important for couples to follow the rules on your list?

Nancy Sheehan / Photo Edit

Family and Couples Therapy

As its name implies, **family therapy** involves treatment of two or more individuals from the same family. One of these, often a troubled adolescent or child, is the initially identified client. Whether family therapy is based on psychodynamic, humanistic, or cognitive behavioral approaches, the family is usually considered as a functioning unit known as a *family system*. As with group psychotherapy, the family therapy format gives the therapist a chance to see how the initially identified client interacts with others, thus providing a basis for discussion of topics that are important to each family member. And as with group psychotherapists, family therapists usually have special training that helps them understand how the problems of individual family members affect and are affected by problems in the complex interactions taking place within the family system as a whole (Kaslow, 2011; Sexton et al., 2013). Ultimately, the client in family therapy is the family itself, and treatment involves as many members as possible (Doherty & McDaniel, 2014). In fact, the goal of family therapy is not just to ease the identified client's problems but also to create greater harmony and balance within the family by helping each member understand family interaction patterns and the problems they create (Blow & Timm, 2002).

In **couples therapy**, improving communication between partners is one of the most important targets of treatment (Long & Andrews, 2011). Discussions in couples therapy sessions typically focus on identifying the miscommunication or lack of communication that interferes with the couples' happiness and intimacy (Sexton et al., 2013). Often the sessions revolve around learning to abide by certain "rules for talking" (see Figure 15.2). For some therapists, helping couples become closer also means helping them express emotions more honestly and be more accepting of one another (Gurman, 2011). One version of couples therapy focuses on strengthening the bond between partners by teaching them how to deal with their unsolvable problems and recover from their fights by making at least five times as many positive statements as negative ones (Gottman, Driver, & Tabares, 2002). Some therapists even offer preventive treatment to couples who are at risk for relationship problems (Gottman, Gottman, & Shapiro, 2010). ("In Review: Approaches to Psychological Treatment" summarizes key features of the main approaches to treatment that we have discussed so far.)

APPROACHES TO PSYCHOLOGICAL TREATMENT

IN REVIEW

Dimension	Classical Psychoanalytic	Contemporary Psychodynamic	Humanistic	Behavioral/Cognitive Behavioral
Nature of the human being	Driven by sexual and aggressive urges	Driven by the need for human relationships	Has free will, choice, and capacity for self-actualization	Is a product of social learning and conditioning; behaves on the basis of experience
Therapist's role	Neutral; helps client explore meaning of free associations and other material from the unconscious	Active; develops relationship with client as a model for other relationships	May be active or nondirective; facilitates client's growth	Active, action oriented; teacher/trainer helps client replace undesirable thoughts and behaviors
Focus	Unresolved unconscious conflicts from the distant past	Understanding the past but focusing on current relationships	Here and now; focus on immediate experience	Current behavior and thoughts; may not need to know original causes to create change

(continued)

APPROACHES TO PSYCHOLOGICAL TREATMENT (CONT.)

Dimension	Classical Psychoanalytic	Contemporary Psychodynamic	Humanistic	Behavioral/Cognitive Behavioral
Goals	Psychosexual maturity through insight; strengthening of ego functions	Correcting effects of early attachment failures; developing satisfying intimate relationships	Expanded awareness; fulfillment of potential; self-acceptance	Changes in thinking and behavior in particular classes of situations; better self-management
Typical methods	Free association; dream analysis, analysis of transference	Analysis of interpersonal relationships, including the client-therapist relationship	Reflection-oriented interviews convey unconditional positive regard, empathy, and congruence; exercises to promote self-awareness	Systematic desensitization, flooding, implosive therapy, modeling, assertiveness and social skills training, positive reinforcement, extinction, aversion conditioning, punishment, cognitive restructuring

In Review Questions

- Object relations therapy and interpersonal therapy are both contemporary examples of the _____ approach to psychological treatment.
- Imagining increasingly fear-provoking stimuli while relaxed is a treatment method called _____.
- Reflection is an interviewing technique associated mainly with the _____ approach to treatment.

EVALUATING PSYCHOTHERAPY

How effective is psychotherapy?

Twenty years ago, a consumer magazine's survey suggested that most clients believe that psychotherapy is effective (Consumer Reports, 1995; Seligman, 1996), but confirming that effectiveness through scientific research has been challenging and controversial.

LINKAGES Can therapy change personality? (a link to Personality)

The value of psychotherapy was first widely questioned in 1952, when British psychologist Hans Eysenck reviewed studies in which thousands of clients had received either traditional psychodynamic therapy, various other therapies, or no treatment. To the surprise and dismay of many therapists, Eysenck (1952) found that the percentage of clients who improved following any kind of psychotherapy was actually lower than among people who received no treatment.

Critics argued that Eysenck was wrong (e.g., Bergin, 1971; de Charms, Levy, & Wertheimer, 1954; Luborsky, 1972). They claimed that he had ignored studies supporting the value of psychotherapy and had misinterpreted the data. In fact, when some of these critics reviewed treatment successes and failures themselves, they concluded that psychotherapy tends to be *more* helpful than no treatment (e.g., Bergin, 1971).

Debate over Eysenck's findings and the contradictory reports that followed them highlight several reasons why it is so hard to answer the apparently simple question of whether psychotherapy works. For one thing, there is the problem of how to measure improvement in psychotherapy. Should we focus on psychological test results, behavioral observations, interviews, or a combination of all three? Different measurements may tell somewhat different stories about improvement, making it difficult for researchers to

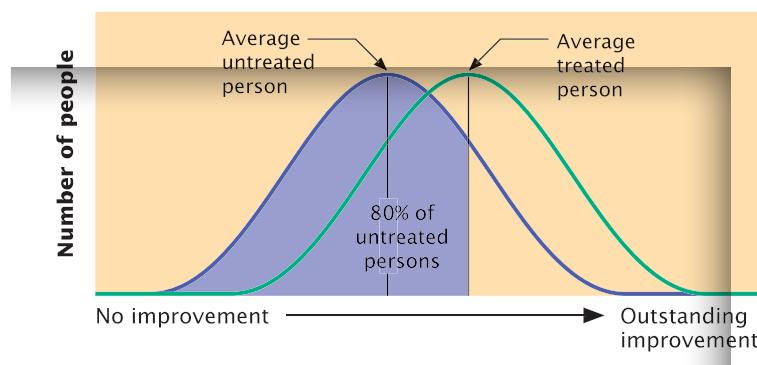


FIGURE 15.3
An Analysis of Psychotherapy's Effects

These curves show the results of a large-scale analysis of the effects of psychotherapy. Notice that on average, people who received therapy were better off than 80 percent of troubled people who did not. The overall effectiveness of psychotherapy has also been confirmed in an analysis of 90 treatment outcome studies (Shadish et al., 2000) and in other research reviews (Nathan & Gorman, 2007; Weisz & Kazdin, 2010).

compare or combine the results of different studies and draw conclusions about the overall effectiveness of treatment (Achenbach, 2011; De Los Reyes, 2011; Wampold et al., 2011).

The question of effectiveness is further complicated by the broad range of clients, therapists, and treatments involved in psychotherapy. Clients differ in the problems they present, in their motivation to solve those problems, and in the amount of stress and social support present in their environments (Petrie & Weinman, 2012; Price & Anderson, 2012). Therapists differ, too, not only in skill, experience, and personality but also in which of the hundreds of available treatment procedures they

decide to use and for how long (Barkham et al., 2006; Norcross, Beutler, & Levant, 2005; Owen, 2013; Tracey et al., 2014). In addition, differences in the nature and quality of the client-therapist relationship from one case to another can significantly alter the course of treatment, the clients' belief in the procedures, and their willingness to cooperate (Bohart & Wade, 2013). Because clients' responses to psychotherapy can be influenced by all of these factors, results from any particular treatment evaluation study might not tell us much about how well different therapists using different methods would do with other kinds of clients and problems (Lambert, 2013).

In short, the question of whether psychotherapy "works" is difficult (if not impossible) to answer scientifically in a way that applies to all therapies for all disorders. However, several research reviews (e.g., Antony & Barlow, 2010; Lambert, 2013; Norcross, 2011; Weisz & Kazdin, 2010) have suggested that, in general, psychotherapy does work (see Figure 15.3).

THINKING CRITICALLY

ARE ALL FORMS OF THERAPY EQUALLY EFFECTIVE?

As you might imagine, most therapists agree that psychotherapy is effective, and most believe that the theoretical approach and treatment methods *they* use work better than those of other therapists (Mandelid, 2003).

What am I being asked to believe or accept?

They can't all be right, of course, and some researchers claim that all of them are wrong. These researchers argue that the success of psychotherapy doesn't have much to do with theories about the causes of behavior disorder, or even with the specific treatment methods used in treatment. All approaches, they say, are equally effective. This has been called the "Dodo Bird Verdict," named after the *Alice in Wonderland* creature who when called on to judge who had won a race answered, "Everybody has won and all must have prizes" (Duncan, 2002; Luborsky, Singer, & Luborsky, 1975).

What evidence is available to support the assertion?

Evidence exists to suggest that there are no significant differences in the overall effectiveness of psychodynamic, humanistic, and behavioral therapies. Statistical analyses that combine the results of a large number of therapy studies show that the three approaches are associated with about the same degree of success (e.g., Keefe et al., 2014; Luborsky, Rosenthal, & Diguer, 2003; Shadish et al., 2000; Weisz, McCarty, & Valeri, 2006).

Are there alternative ways of interpreting the evidence?

Those who question the Dodo Bird Verdict say that evidence in its favor is based on statistical methods that cannot detect genuine differences among treatments (Barlow, 2010). Statistical

(continued)

analyses that average the results of many different studies might not reveal important differences in the impact of particular treatments for particular problems (Ehlers et al., 2010). Suppose, for example, that Therapy A works better than Therapy B in treating anxiety but that Therapy B works better than Therapy A in cases of depression. If you combined the results of treatment studies with both kinds of clients, the average effects of each therapy would be about the same, making it appear that the two treatments are about equally effective. Differences among the effects of specific treatment procedures might also be overshadowed by the beneficial *common factors* shared by almost all forms of therapy—such as the support of the therapist, the hope and expectancy for improvement that therapy creates, and the trust that develops between client and therapist (Laska, Gurtman, & Wampold, 2013). Therapists whose personal characteristics can motivate clients to change might promote that change no matter what specific therapeutic methods they use (Owen, 2013).

What additional evidence would help evaluate the alternatives?

Debate is likely to continue over whether, on average, all forms of psychotherapy are about equally effective, but to many researchers, this is the wrong question. They argue that it's pointless to compare the effects of psychodynamic, humanistic, and behavioral methods in general. It is more important, they say, to address what Gordon Paul called the "ultimate question" about psychotherapy: "What treatment, by whom, is most effective for this individual with that specific problem, under what set of circumstances?" (Paul, 1969).

What conclusions are most reasonable?

Statistical analyses show that various treatment approaches appear about equally effective overall. But this does not mean that every psychotherapy experience will be equally helpful. Potential clients must realize that the success of their treatment can still be affected by how severe their problems are, by the quality of the therapeutic relationship they form with a therapist, by their motivation to change, and by the appropriateness of the therapy methods chosen for their problems (Haque & Waytz, 2012; Hatfield et al., 2010).

Like those seeking treatment, many clinical psychologists are eager for more specific scientific evidence about the effectiveness of particular therapies for particular kinds of clients and disorders. These empirically oriented clinicians are concerned that, all too often, therapists' choices of therapy methods depend more heavily on personal preferences or current fads and trends rather than on objective evidence of effectiveness (Lambert, 2013; Lilienfeld et al., 2013). Empirically oriented psychotherapists believe that advocates of any treatment—whether it is object relations therapy or systematic desensitization—must demonstrate that its benefits are the result of the treatment itself and not just of the passage of time, the effects of repeated assessment, the client's motivation and personal characteristics, or other confounding factors (Chambless & Hollon, 1998). In other words, these clinicians advocate **evidence-based practice**, in which practitioners make decisions about which methods to use based mainly on the results of empirical evidence about the effectiveness of those methods. A movement to use evidence-based practice has also appeared in the medical and dental professions (Diamond, 2014; Richards, 2013; Sniderman et al., 2013).

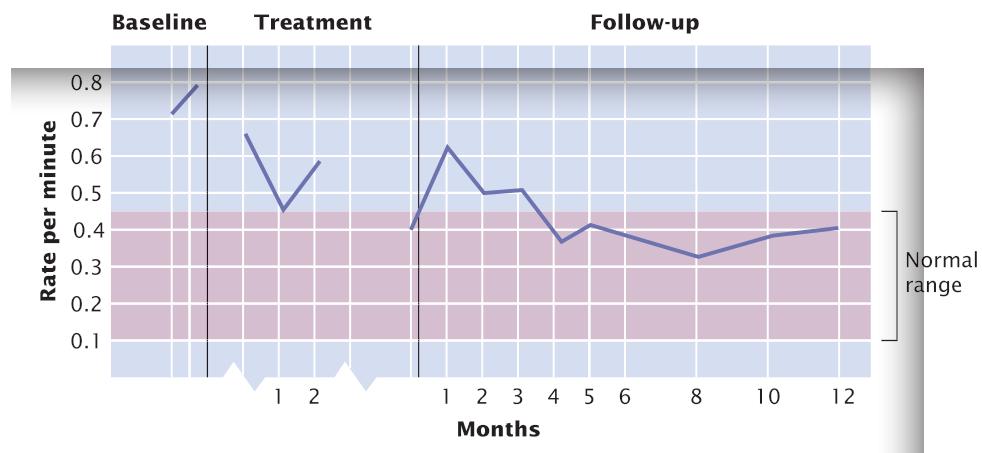
Empirically oriented clinicians also want to see evidence that the benefits of treatment are clinically significant. To be *clinically significant*, therapeutic changes must be great enough to make the feelings and actions of treated clients similar to those of people who have not experienced these clients' disorders (Crits-Christoph et al., 2008; Kazdin, 2011). For example, a reduction in treated clients' scores on an anxiety test might be *statistically significant*, but the change would not be clinically significant unless those clients now feel and act more like people without an anxiety disorder (see Figure 15.4). The need to demonstrate clinical significance has become more important than ever as increasingly cost-conscious clients and their health insurance companies decide whether and how much to pay for various psychotherapy services. The most scientific way to evaluate treatment effects is through studies in which clients are randomly assigned to various treatments or control conditions and their progress is measured objectively.

evidence-based practice The selection of treatment methods based mainly on empirical evidence of their effectiveness.

FIGURE 15.4
Clinical Significance

Evaluations of psychological treatments must consider the clinical, as well as statistical, significance of observed changes. The shaded area of this graph shows the range of deviant behaviors per minute displayed at home by normal boys. The solid line shows the average rate of deviant behaviors for boys in an operant conditioning treatment for severe behavior problems. The improvement following reinforcement of appropriate behavior was not only statistically significant (compared with the pretreatment baseline) but also clinically significant, in as much as the once-deviant behavior came to resemble that of normal boys.

Source: G.R. Patterson. "Intervention for Boys with Conduct Problems: Multiple Settings, Treatments, And Criteria". *Journal Of Consulting And Clinical Psychology*, vol. 42, p. 476. American Psychological Association.



FOCUS ON RESEARCH METHODS

WHICH THERAPIES WORK BEST FOR WHICH PROBLEMS?

To help clinicians select treatment methods on the basis of this kind of empirical evidence, the Society of Clinical Psychology (a division of the American Psychological Association) created a task force in 1993, called the Task Force on Promotion and Dissemination of Psychological Procedures.

What was the researchers' question?

The question addressed by this task force was "What therapies have proven themselves most effective in treating various kinds of psychological disorders?"

How did the researchers answer the question?

Working with other empirically oriented clinical psychologists, this task force examined thousands of studies that evaluated the psychotherapy methods used for treating mental disorders, marital distress, and health-related behavior problems in children, adolescents, and adults.

What did the researchers find?

The task force found that a number of treatments—known as **empirically supported therapies**, or **ESTs**—had been validated by controlled experimental research (Chambless & Ollendick, 2001; DeRubeis & Crits-Christoph, 1998; Kendall & Chambless, 1998; Norcross, 2001, 2002). These therapies were called "efficacious and specific" and "well-established" if they had been found superior to no treatment or to some alternative treatment in at least two randomized clinical trials (RCTs). RCTs are experiments in which clients are randomly assigned to different treatment or control conditions. Also included in this "well established" category were treatments supported by scientific measures in a large number of carefully conducted case studies. Treatments were called "probably efficacious" if they had been supported by at least one RCT or by a smaller number of rigorously evaluated case studies. Finally, treatments were labeled "possibly efficacious" if they had been supported only by a mixture of data from single-case studies or other nonexperimental designs (Chambless & Ollendick, 2001).

Years later, another APA task force was asked to update experimental research on treatment effectiveness and to integrate that knowledge with what clinical expertise can tell us about treating people from various sociocultural backgrounds in real-world treatment

(continued)

empirically supported therapies (ESTs) Treatments for psychological disorders whose effectiveness has been validated by controlled experimental research.

settings. The goal was to seek consensus among researchers and clinicians about which specific treatments, and which specific clinical practices, are most likely to lead to improvements in mental health. The result was the establishment of guidelines for *evidence-based practice (EBP) in psychology* (APA Presidential Task Force on Evidence-Based Practice, 2006). Table 15.2 contains some examples of what the EBP task force found.

What do the results mean?

The authors of the original report on empirically supported therapies, the authors of the more recent EBP guidelines, and psychologists who support their efforts argue that by relying on analysis of experimental research and other high-quality clinical studies, they have scientifically evaluated various treatments. They have generated a list of methods from which consumers—and clinicians who want to conduct an evidence-based practice—can choose with confidence when dealing with specific disorders (e.g., Kazdin, 2011; Lambert, 2013). They also suggest that many of the *treatment manuals* that guided therapists in psychotherapy outcome experiments can help other clinicians deliver evidence-based therapies exactly as they were intended (e.g. Beintner, Jacobi, & Schmidt, 2014).

Not everyone agrees with the conclusions or recommendations of the two APA task forces (see Norcross, 2011). Critics note, first, that treatments missing from the latest list of effective therapies haven't necessarily been discredited. Some of those treatments might not yet have been studied thoroughly enough or validated in relation to the efficacy criteria selected by the task force (Lantz, 2004; Westen & Morrison, 2001). These critics also have doubts about the value of some of those criteria. They point to research showing that had the first task force used different outcome criteria, it might have reached different (and perhaps less optimistic) conclusions about the value of some empirically supported treatments (Bradley et al., 2005; Thompson-Brenner, Glass, & Westen, 2003). Critics argue further that the first list of effective therapies was based on research that may not be relevant to clinicians working in the real world of clinical practice. They note that experimental studies of psychotherapy have focused mainly on relatively brief treatments for highly specific disorders, even though most clients' problems tend to be far more complex (Westen & Bradley, 2005). These studies also focused on the therapeutic procedures used rather than on the characteristics and interactions of therapists and clients (Bohart & Wade, 2013). This emphasis on procedure is a problem, critics say, because the outcome of therapy in these experiments might have been strongly affected by client-therapist factors, such as whether the random pairing of clients and therapists resulted in a match or a mismatch on certain personal characteristics. In real clinical situations, clients and therapists are not usually paired up at random (Goldfried & Davila, 2005; Hill, 2005). Finally, because therapists participating in experimental research were required to follow standard treatment manuals, they were not free to adapt treatment methods to the needs of particular clients, as they normally would do (Lambert, 2013). Perhaps, say critics, when there is less experimental control over the treatment situation, all therapies really are about equally effective, as suggested by the statistical analyses of outcome research we mentioned earlier (Shadish et al., 2000; Smith, Glass, & Miller, 1980). In short, these critics reject the idea of creating lists of effective therapies as useful guides.

The APA's evidence-based task force was created partly in response to these concerns, and its practice guidelines are based on results not just from randomized clinical trials but also from less-rigorous studies of therapy and the therapeutic relationship and from clinicians' experiences in real-world treatment settings (Norcross, 2011).

What do we still need to know?

The effort to develop evidence-based practice in clinical psychology represents an important step in responding to Paul's (1969) "ultimate question" about psychotherapy: "What treatment, by whom, is most effective for this individual with that specific problem, under what set of circumstances?" We still have a long way to go to answer all aspects of this question, but empirically oriented clinical psychologists are determined to do so (e.g., Karlin & Cross, 2014; Youn, Kraus, & Castonguay, 2012).

There remains a significant divide, though, between those who would base treatment decisions mainly on the outcome of controlled experimental research and those who feel that the guidance provided by research results must be interpreted and adjusted in light of clinical judgment and experience. The work of the evidence-based task force

shows that clinical researchers and clinical practitioners are looking for common ground. It remains to be seen if they will be able to bridge the gap between them in a way that makes the best use of both domains of knowledge in the service of clients' welfare (Grossman & Walisch, 2014).

TABLE 15.2 EXAMPLES OF EVIDENCE-BASED PRACTICE THERAPIES THAT WORK FOR SELECTED DISORDERS

Treatments listed here as having "strong" research support are those that meet the criteria originally defined as "well established" in the original APA Task Force Report (Chambless et al., 1998). Those listed as having "modest" research support are comparable to those defined earlier as "probably efficacious." Therapies appear in the "controversial research support" column either because outcome research on them has produced mixed results or because the reason that they work is still uncertain. For more information on evidence-based practice and research-supported psychological treatments, visit the website of the Society of Clinical Psychology. Information on evidence-based therapies for children and adolescents can be found by searching the Internet for "effective child therapy." There are also reviews of empirical research aimed at identifying potentially harmful therapies (Barlow, 2010; Lilienfeld, 2007; Norcross, et al., 2010).

Problem	Strong Research Support	Modest Research Support	Controversial Research Support
Major depression	Behavior therapy/behavior activation Cognitive behavior therapy Cognitive therapy Interpersonal therapy Problem-solving therapy	Acceptance and commitment therapy Short-term psychodynamic therapy Behavioral couples therapy	
Specific phobia	Exposure therapies Cognitive behavior therapy		Psychoanalytic treatment
Panic disorder			Applied relaxation
Generalized anxiety disorder	Cognitive and behavior therapies		
Obsessive-compulsive disorder	Exposure and response prevention Cognitive therapy	Acceptance and commitment therapy	
Posttraumatic stress disorder	Prolonged exposure Cognitive processing therapy Present-centered therapy	Stress inoculation	Eye movement desensitization and reprocessing (EMDR)
Schizophrenia	Social skills training Cognitive behavior therapy Assertive community treatment Family psychoeducation Social learning/token economy programs Cognitive remediation	Cognitive adaptation training Illness management and recovery Acceptance and commitment therapy	
Alcohol use disorder	Motivational interviewing Motivational enhancement therapy (MET) MET plus cognitive behavior therapy Behavioral couples therapy	Moderate drinking therapy Prize-based contingency management	
Mixed substance use disorders	Motivational interviewing Motivational enhancement therapy (MET) MET plus cognitive behavior therapy Prize-based contingency management Seeking safety	Friends care program Guided self-change	
Borderline personality disorder	Dialectical behavior therapy	Mentalization-based treatment Schema-focused therapy	Transference-focused therapy

Source: <http://www.div12.org/PsychologicalTreatments/index.html>.

Though the combinations of treatment methods and therapist and client characteristics that are best suited to solving particular psychological problems have not yet been mapped out, a few notable trends have emerged. For example, when differences in the effectiveness of different treatments occur in comparative studies of adult psychotherapy, they tend to reveal a small to moderate advantage for behavioral and cognitive behavioral methods—especially in the treatment of phobias and certain other anxiety disorders (e.g., Antony & Barlow, 2010; Chaker, Hofmann, & Hoyer, 2010; Craske & Barlow, 2008; Hollon, Stewart, & Strunk, 2006; Houben, Wiers, & Jansen, 2011; Mochizuki-Kawai et al., 2010; Tolin, 2010), and in the prevention and treatment of eating disorders (Hendricks & Thompson, 2005; Wilson et al., 2010). The same overall trend holds true in the treatment of child and adolescent clients (Carr, 2009; Kazak et al., 2010; Kendall et al., 2008). Cognitive methods appear to be less effective, however, at dealing with severe disorders such as schizophrenia (Morrison et al., 2012). Psychodynamic methods are still quite controversial. As shown in Table 15.2, interpersonal therapy and short-term psychodynamic therapy have received strong and modest support, respectively, for the treatment of depression, but some studies have found this approach no more effective overall than placebo or other methods (Shedler, 2010; Smit et al., 2012).

The client-therapist relationship seems to play a significant role in the success of many forms of treatment (e.g., Norcross, 2011; Zuroff & Blatt, 2006). Certain people seem to be particularly effective in forming productive human relationships. Even without formal training, these people can sometimes be as helpful as professional therapists because of personal qualities that are inspiring, healing, and soothing to others (Hill & Lent, 2006; Ronnestad & Ladany, 2006). These qualities may help account for the success of many kinds of therapy.

In summary, the Dodo Bird Verdict is probably incorrect, and it is certainly incomplete. Although different treatments can be equally effective in addressing some disorders, empirical research shows that for other disorders, certain therapies are more effective than others. That research provides valuable guidelines for matching treatments to disorders, but it doesn't guarantee success. The outcome of any given case will also be affected by characteristics of the client, characteristics of the therapist, and the nature of the therapeutic relationship that develops between them (Baldwin & Imel, 2013; Bohart & Wade, 2013). The challenge now is to combine research on empirically supported therapy methods with research on the common factors they share and create a picture of the effectiveness of psychotherapy methods that is based on both sets of data (Messer, 2004; Westen & Bradley, 2005). Such a comprehensive view would be a useful guide for clinicians practicing today and an ideal training model for the clinicians of tomorrow.

Given what is known so far, potential clients should choose a treatment approach and a therapist based on (1) suggestions from empirical research about the best treatment for their particular problem; (2) the treatment approach, methods, and goals the person finds most comfortable and appealing; (3) information about the potential therapist's "track record" of clinically significant success with a particular method for treating problems similar to those the person faces; and (4) the likelihood of forming a productive relationship with the therapist. This last consideration assumes special importance when the client and the therapist do not share similar social or cultural backgrounds.

Sociocultural Factors in Therapy

Sociocultural differences between clients and therapists—in religious faith, gender, age, ethnicity, sexual orientation, socioeconomic background, and the like—can sometimes create miscommunication or mistrust (Seeley, 2006). If it does, their working relationship and the clients' motivation to change may both be impaired (Vasquez, 2007; Wintersteen, Mensinger, & Diamond, 2005). Suppose, for example, that a therapist suggests that a client's insomnia is a reaction to stress, but the client is sure that it comes as punishment for having offended a long-dead ancestor. That client may not easily accept a treatment based on the principles of stress management (Wohl, 1995). Similarly, a therapist who believes that people should



Preparing for Therapy

Special pretreatment orientation programs may be offered to clients who, because of sociocultural factors, are unfamiliar with the rules and procedures of psychotherapy. These programs provide a preview of what psychotherapy is, how psychotherapy can help, and what the client is expected to do to make it more effective (Reis & Brown, 2006; Swartz, Zuckoff et al., 2007).

Rhoda Sidney/PhotoEdit

Meredith & Baker, 2007; Rogers & Molina, 2006; Vasquez & Jones, 2006). Also, some U.S. states require clinical psychologists to take courses on how culture affects therapy in order to qualify for their licenses (Rehm & DeMers, 2006). Cultural diversity training is also required for graduate students in clinical and counseling psychology training programs accredited by the American Psychological Association (Commission on Accreditation, 2008; Smith, Constantine et al., 2006). Such training helps clinicians appreciate, for example, that it may be considered impolite in some cultures to make eye contact with a stranger. Armed with this information, a therapist is more likely to realize that people from those cultures are not necessarily depressed, lacking in self-esteem, or overly submissive just because they look at the floor during an interview. In the meantime, many minority clients are likely to encounter a therapist from a differing background, so researchers are examining the value of matching therapeutic techniques with clients' culturally based expectations and preferences (Meyer, Zane, & Cho, 2014).

There is no guarantee that cultural diversity training for therapists improves treatment results (Shin et al., 2005), but it can help (Sue & Sue, 2012). Though all therapists will not be equally effective with clients of all sociocultural backgrounds, cultural diversity training offers a way to improve therapists' *cultural competence*, an extension of Carl Rogers's concept of empathy. When therapists appreciate the client's view of the world, it is easier for them to set goals that are in harmony with that view (Comas-Diaz, 2014). Minimizing misunderstanding and miscommunication is one of the many ethical obligations that therapists assume when working with clients (Tomes, 1999). Let's consider some others.

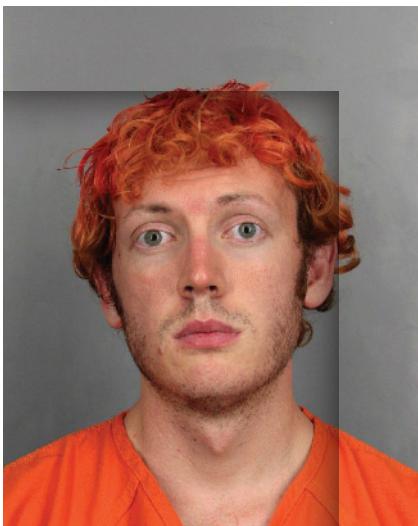
Rules and Rights in the Therapeutic Relationship

Psychotherapy can be an intensely emotional experience, and the relationship established with a therapist can profoundly influence a client's life. Professional ethics and common sense require the therapist to ensure that this relationship does not harm the client. For example, the American Psychological Association's *Ethical Principles of Psychologists and Code of Conduct* forbids a sexual relationship between therapist and client during treatment and for at least two years afterward because of the harm it can cause the client (American Psychological Association, 2002b; Sonne, 2012). Even after two years have passed, therapists may not ethically pursue a sexual relationship with a former client unless they can demonstrate that the relationship is not exploitative or otherwise harmful to that client. Laws in some U.S. states prohibit therapists from ever having a sexual relationship with a former client.

The APA's ethical standards also require therapists to keep strictly confidential everything a client says in therapy. Confidentiality is one of the most important features of a successful therapeutic relationship. It allows the client to reveal unpleasant or embarrassing

confront and overcome life's problems might run into trouble when treating people whose cultural or religious training encourages the calm acceptance of these problems (Sue et al., 2009). In such cases, the result may be much like two people singing a duet using the same music but different lyrics (Martinez et al., 2005; Martinez-Taboas, 2005).

In the United States, cultural clashes may contribute to the underuse of mental health services by new immigrants and several minority populations (Comas-Diaz, 2014; Thurston & Phares, 2008). Accordingly, there are efforts being made to ensure that sociocultural differences do not deprive people of treatment they may need (Cabral & Smith, 2011; Richards & Bergin, 2000). For example, virtually all mental health training programs in North America seek students from traditionally underserved minority groups, in hopes of maintaining a diverse workforce of psychotherapists (e.g.,



Rights of the Mentally Ill

On July 20, 2012, James Holmes, a former graduate student at the University of Colorado, fired several weapons in a local movie theater, killing twelve people and injuring seventy others. A university psychiatrist who had been treating him had previously notified campus police that he could be a threat to other people, but the danger was apparently not clear enough to hospitalize him. Cases such as his are frustrating to mental health professionals, who must always balance the rights of patients against those of the public.

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impulses, behaviors, or events without fear that this information will be repeated to anyone else. Professionals do sometimes consult with one another about a client, but each is required not to reveal information to outsiders (including members of an adult client's family) without the client's consent. The APA's code of ethics even includes standards for protecting confidentiality for the growing number of clients who seek psychological services via *telehealth* or *e-health* channels, which include telephone, Skype, FaceTime, e-mail, or online links (Aguilera & Munoz, 2011; Ragusea, 2012; Slone, Reese, & McClellan, 2012; Yuen et al., 2012). One of these standards requires therapists to inform clients that others might be able to gain access to their electronic communication and that no formal client-therapist relationship exists in e-mail exchanges (Van Allen & Roberts, 2011).

Professional standards about confidentiality are backed up in most U.S. states and in federal courts by laws that recognize that information revealed in therapy—like information given to a priest, a lawyer, or a physician—is privileged communication. This means that a therapist can refuse—even in court—to answer questions about a client or to provide personal notes or recordings from therapy sessions (Fisher, 2012). In special circumstances therapists may be legally required to violate confidentiality (Donner et al., 2008), including when (1) a client is so severely disturbed or suicidal that hospitalization is needed; (2) a client uses his or her mental condition and history of therapy as part of a defense in a courtroom trial; (3) the therapist must defend against a client's charge of malpractice; (4) a client reveals information about sexual or physical abuse of a child; and (5) the therapist believes a client may commit a violent act against a specific person.

Several U.S. states now have laws that make a therapist liable for failing to take steps to protect those who are threatened with violence by the therapist's clients (Bersoff, 2008; Werth, Welfel, & Benjamin, 2009). Other states allow therapists more discretion in warning or protecting potential victims (Carson & Bull, 2003).

Other laws protect people in the United States from being committed to mental hospitals without good cause (Lareau, 2013). Before people can be forcibly committed, the state must provide "clear and convincing" evidence that they are not only mentally ill but also gravely disabled or an "imminent danger" to themselves or others. While hospitalized, patients have the right to receive treatment, but they also have the right to refuse certain forms of treatment (Carson & Bull, 2003). These rules are designed to protect hospitalized mental patients from abuse, neglect, or exploitation, but the right to refuse treatment does not extend to hospitalized patients who pose a danger to themselves or others (Manahan, 2004).

Hospitalized patients who do not pose such dangers—including those whose dangerous impulses are being suppressed by prescription medications—have the right to be subjected to minimal restriction of their freedom (Bell, 2005). Accordingly, they are released from mental hospitals, usually with a supply of medication that they are to take on their own. Unfortunately, not all these patients follow doctors' orders. Andrew Goldstein was not considered dangerous as long as he took his antipsychotic medication, but after being released from a New York City mental hospital in December 1998, he stopped doing so. About two weeks later, Goldstein pushed Kendra Webdale to her death under the wheels of a subway train (Perlin, 2003). Cases such as these put the staff at mental health facilities in a bind—they worry about being sued if they keep patients unnecessarily confined or if someone is harmed by a patient they have released too soon (Bonta, Blaise, & Wilson, 2014). In an effort to strike a balance between the rights of mental patients and those of the public, several states now have laws requiring outpatient treatment for people who are dangerous when not medicated. The New York statute is known as Kendra's Law (Appelbaum, 2005).

BIOLOGICAL TREATMENTS

Is electric shock still used to treat psychological disorders?

So far, we have described psychological approaches to the treatment of mental disorders. But there are also biological treatments, primarily offered by psychiatrists and other medical doctors, who often work in cooperation with psychologists. Today, biological



Hospital Restraints

Here are examples of the chains, straitjackets, belts, and covered bathtubs that were used to restrain disruptive patients in North American and European mental hospitals in the 1800s and well into the 1900s. These devices were gentle compared with some of the methods endorsed in the late 1700s by Benjamin Rush. Known as the father of American psychiatry, Rush advocated curing patients by frightening or disorienting them—for example, by placing them in a coffin-like box that was then briefly immersed in water.

The Medical History Museum of the University of Zürich

psychosurgery Surgical procedures that destroy tissue in small regions of the brain in an effort to treat psychological disorders.

electroconvulsive shock therapy (ECT) A brief electric shock administered to the brain, usually to reduce severe depression that does not respond to medication treatments.

treatments for psychological problems mainly involve prescription medications. As late as the mid-1900s, however, the most common biological treatments for severe psychological disorders were brain surgery and electric shock.

Psychosurgery

Psychosurgery involves treating mental disorders by using procedures that destroy brain tissue. Among the first to try these procedures was a Portuguese neurosurgeon, António Egas Moniz. In 1935, he developed a technique, called *prefrontal lobotomy*, in which small holes are drilled in the front of the skull and a sharp instrument is inserted and moved from side to side to cut connections between the prefrontal cortex and the rest of the brain (Freeman & Watts, 1942; Moniz, 1948). Moniz's theory was that emotional reactions in disturbed people become exaggerated due to neural processes in the frontal lobes, and he believed that the lobotomy disrupts these processes. During the 1940s and 1950s, psychosurgery became almost routine in the treatment of schizophrenia, depression, anxiety, aggressiveness, and obsessive-compulsive disorder (Valenstein, 1980). However, brain surgery carries a risk of complications and is sometimes fatal. Further, its benefits are uncertain, and some problems it can create, including epilepsy, may be irreversible (Balon, 2004). Today, psychosurgery is performed rarely, when all else has failed, and it focuses on much smaller brain areas than those involved in lobotomies (Helmes & Velamoor, 2009; Mathern & Miller, 2013).

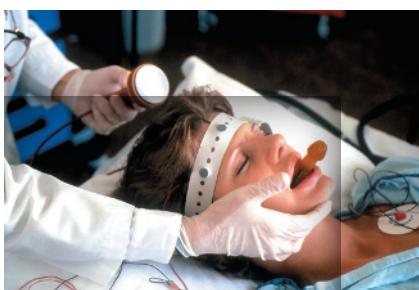
A different type of brain surgery is performed as part of *deep brain stimulation (DBS)*. This procedure places electrodes in the brain to provide pulses of electricity to specified target areas (Oluigbo, Salma, & Rezai, 2012). The amount of electricity delivered is adjusted over time, based on how a person responds to treatment. DBS was first used to treat movement disorders such as Parkinson's disease (Yu & Neimat, 2008), but it has also proven helpful in people whose severe depression or obsessive-compulsive disorder did not respond to other therapies (Mohr et al., 2011; Williams & Okun, 2013).

In yet another surgical procedure, called *vagal nerve stimulation (VNS)*, a pacemaker-like device is implanted in the upper chest and attached by thin wires to the vagus nerve in the neck (Christancho et al., 2011). Signals from this stimulated nerve are carried into the brain, where they are effective not only in reducing seizures in patients with epilepsy (Patel et al., 2013) but also in treating some forms of depression (Mohr et al., 2011).

Electroconvulsive Shock Therapy

Another form of biological treatment is based on work in the 1930s by a Hungarian physician named Ladislaus von Meduna. He used a drug to induce convulsions in people with schizophrenia. He believed—incorrectly—that because schizophrenia and epilepsy sometimes (though rarely) occur in the same person, epileptic-like seizures might combat schizophrenia. In 1938, Italian physicians Ugo Cerletti and Lucio Bini created seizures by passing an electric current through the brains of patients with schizophrenia. During the next twenty years or so, this procedure, called **electroconvulsive shock therapy (ECT)**, became a routine treatment for schizophrenia, depression, and sometimes mania. Many patients improved at first, but their problems often reappeared. The benefits of ECT also had to be weighed against side effects such as memory loss, confusion, speech disorders, and, in some cases, death due to cardiac arrest (Lickey & Gordon, 1991; Shiach, Reid, & Carmody, 2001).

Today, ECT is given mainly to people with severe depression (and occasionally mania) who do not respond to medication (de Macedo-Soares et al., 2005; Payne & Prudic, 2009; Weiner & Falcone, 2011). It can be quite effective (e.g., Martínez-Amorós et al., 2012), though a high percentage of patients experience a return of depression after a few months (Huuhka et al., 2012). They sustain benefits longer if their course of ECT is followed by psychotherapy (Brakemeier et al., 2013). Although the use of ECT is less common now than it was in the 1950s in the United States (Case et al., 2013), it is given more frequently



Electroconvulsive Shock Therapy (ECT)

Approximately 100,000 individuals in the United States receive ECT each year (Payne & Prudic, 2009). ECT remains a controversial treatment (Breggin, 2007). Critics point to fears of possible brain damage, but proponents say the benefits of ECT for certain patients outweigh its potential dangers.

Will McIntyre/Science Source

than coronary bypass operations, appendectomies, and tonsillectomies (Mathew, Amiel, & Sackeim, 2005). This is despite the fact that scientists are still unsure why ECT works (e.g., Perrin et al., 2012; Shorter & Healy, 2007) and that there is still uncertainty about the degree to which repeated ECT causes lasting effects on the brain or on cognitive functions (Abbott et al., 2014; Bergsholm et al., 2012).

In an effort to minimize ECT side effects, doctors today give patients an anesthetic so that they are unconscious before the shock is delivered, along with a muscle relaxant to prevent bone fractures during convulsions. Also, the shock now lasts only about half a second and is usually delivered to only one side of the brain (Magid et al., 2013). In contrast to the dozens of treatments administered decades ago, patients now receive only about six to twelve shocks, one approximately every two days (Shorter & Healy, 2007).

Magnetic seizure therapy (MST) may offer an even safer option than ECT because it induces seizures through timed pulses of magnetic energy, not electrical shocks (Zyss et al., 2010). MST appears effective in treating depression, but its effects may not be as long-lasting as those of traditional ECT (Allan & Ebmeier, 2011; Kayser et al., 2011). A newer procedure called *repetitive transcranial magnetic stimulation (rTMS)*, manages to excite brain cells without causing a seizure. In this technique, a strong magnet is placed on specific regions of the head, creating an electrical field that activates brain cells beneath the magnet. Research suggests that the use of rTMS over certain brain areas can result in some improvement in depression, auditory hallucinations, and posttraumatic stress disorder (Karsen, Watts, & Holtzheimer, 2014; Ren et al., 2014). It is still unclear, however, if there are any harmful side effects of rTMS (Muller, Pascual-Leone, & Rotenberg, 2012), so it is not yet widely available for use.

Psychoactive Medications

The use of ECT declined after the 1950s, in part because psychoactive medications had begun to emerge as more convenient and effective treatment alternatives. In the chapters on biological aspects of psychology and on consciousness, we discuss the effects of psychoactive drugs on neurotransmitter systems, autonomic activity, emotions, thinking, and behavior. Here, we describe their role in combating schizophrenia, depression, mania, and anxiety.

Antipsychotic Medications

Antipsychotics reduce the intensity of psychotic symptoms such as hallucinations, delusions, paranoid suspiciousness, disordered thinking, and confused speech in many mental patients, especially those with schizophrenia. A widely used category of antipsychotics is known as the *phenothiazines* (pronounced “fee-noh-THIGH-uh-zeens”). The first of these, chlorpromazine (marketed as Thorazine in the United States and as Largactil in Canada and the United Kingdom), was especially popular. Another antipsychotic, haloperidol (Haldol), is about as effective as the phenothiazines but creates less sedation (Julien, 2005) and is used frequently today (Joy, Adams, & Lawrie, 2006). Patients who do not respond to one medication may respond to another (Schatzberg, Cole, & DeBattista, 2007). Between 60 and 70 percent of psychiatric patients receiving these medications show improvement, though fewer than 30 percent respond well enough to live successfully on their own (Rothschild, 2010). Together, haloperidol and the phenothiazines are sometimes referred to as *neuroleptics*.

In some people, neuroleptics cause side effects, ranging from dry mouth and sedation to symptoms similar to those of Parkinson’s disease, including muscle rigidity, tremors, and slowed movement. Some of these side effects can be treated with medication, but not always. Some people who take neuroleptics develop an often irreversible movement disorder, called *tardive dyskinesia (TD)* (Blumberger et al., 2014). The symptoms of TD include uncontrollable, repetitive actions, often involving twitching of the face, thrusting of the tongue, and sometimes flailing of the arms and legs (Aquino & Lang, 2014).

antipsychotics Medications that relieve the symptoms of schizophrenia and other severe psychological disorders.



A Natural Cure?

St. John's wort, an herbal remedy, has become a popular nonprescription treatment for depression. One of its active ingredients, *hypericin*, may affect neurotransmitters in the brain, much as do psychoactive medications such as Prozac or Zoloft. One double-blind, placebo-controlled study showed St. John's wort to be no more effective than a placebo for treating major depression (Hypericum-Depression Trial Study Group, 2002), though others have suggested that it helps in cases of milder depression (e.g., Hamerness, Basch, & Ulbricht, 2003; Szegedi et al., 2005). Final conclusions about the safety and effectiveness of St. John's wort must await the results of further research.

Mario Tama/Getty Images

Most of the newer antipsychotic medications are known as *atypical antipsychotics*. Examples include clozapine, olanzapine, quetiapine, risperidol, ziprasidone, and aripiprazole. They are called *atypical* mainly because they are less likely to cause movement disorders (Forand, DeRubeis, & Amsterdam, 2013). Although probably no more effective overall than the neuroleptics, atypical antipsychotics are often better tolerated and so are considered a “first line” antipsychotic medication choice (Meltzer, 2013). Atypical antipsychotics have helped many patients who did not respond to neuroleptics (Rothschild, 2010). Unfortunately, some of their possible side effects require the treating doctor to monitor patients carefully, sometimes with blood tests and other studies (Meyer, 2007; Stöllberger, Huber, & Finsterer, 2005).

Antidepressant Medications

Soon after antipsychotics appeared, they were joined by **antidepressants**, a class of medications that is now widely used to relieve the symptoms of depression (Forand et al., 2013). There are several types of antidepressants. The *monoamine oxidase inhibitors (MAOIs)* were used to treat depression, especially when accompanied by anxiety and panic (Julien, 2008). Medications in another category, the *tricyclic antidepressants (TCAs)*, were prescribed even more often than MAOIs because they worked better with fewer side effects.

Today, however, there are newer options that are tolerated even better (Undurraga & Baldessarini, 2012). The most popular of these are *selective serotonin reuptake inhibitors (SSRIs)*, of which fluoxetine (Prozac) was the first example. Introduced in 1986, fluoxetine quickly became the most widely used antidepressant medication in North America (Brambilla et al., 2005). Its popularity was because it is as effective as older medications but in most cases has fewer and milder side effects—mainly weight gain, sexual dysfunction, and gastrointestinal problems (e.g., Magni et al., 2013). Many other SSRIs are in common use now as well (Deshauer et al., 2008), and even newer examples of antidepressants have been developed (Stahl et al., 2013), including venlafaxine (Effexor), desvenlafaxine (Pristiq), duloxetine (Cymbalta), bupropion (WellButrin), mirtazapine (Remeron), and trazodone (Desyrel).

There is some debate about the benefits of antidepressants (Davis et al., 2011; Ioannidis, 2008). For example, whereas about 50 to 70 percent of patients who take antidepressant drugs experience improved mood, greater physical activity, increased appetite, and better sleep, others do not (Baghai, Möller, & Rupprecht, 2006; Craighead & Dunlap, 2014). And drug trials comparing their effects to those of placebos have shown a shrinking advantage for these medications over the last thirty years (Khin et al., 2011; Undurraga & Baldessarini, 2012). Does this mean that the newer antidepressants do not work as well as the older ones? Not necessarily. True, depressed people who received placebo treatment have been doing better in more recent drug trials than in previous ones (Schalkwijk et al., 2014), but more research will be needed to determine whether this change might reflect changes in the research designs and statistical analyses used in the newer studies.

Unfortunately, only about 10 to 20 percent of people suffering the most severe psychotic depression show good improvement with antidepressant medication alone (Fournier et al., 2010). An analysis of pharmaceutical companies' clinical trial data submitted to the U.S. Food and Drug Administration by the makers of six widely prescribed antidepressant medications showed that in 57 percent of the trials, antidepressant medications did only a little better than placebo at relieving severe depression (Kirsch et al., 2002; Kirsch, Scoboria, & Moore, 2002). A more recent study found similar results when comparing the effects of newer antidepressants and placebos (Kirsch, 2009). Final conclusions must await better research, though, because there are far too few well-designed placebo controlled studies on medications for the most severe forms of depression (Wijkstra et al., 2013). For now, defenders of antidepressant medications argue that even relatively small effects are better than none (e.g., Baldwin, 2011), whereas critics contend that those effects are too small to

antidepressants Medications that reduce symptoms of depression.

matter, especially when viewed in light of these drugs' high cost and potential side effects (Ioannidis, 2008). Fortunately, some antipsychotic medications appear to help people with depression, even severe psychotic depression, when they do not respond to antidepressant medication alone (e.g., Gabriel, 2013; Nelson et al., 2014; Thase, 2011, 2013).

Lithium and Anti-Seizure Medications

The mineral salt lithium carbonate, when taken regularly, prevents both the depression and the mania associated with bipolar disorder in some people (Rybakowski, 2014). Without lithium, the typical person with bipolar disorder has a manic episode about every fourteen months and a depressive episode about every seventeen months (American Psychiatric Association, 2000); with lithium, attacks of mania occur as rarely as every nine years (Geddes et al., 2004; Ketter, 2010). Lithium may be particularly valuable in lowering the risk of suicide in people with bipolar disorder (Cipirani et al., 2013). The lithium dosage must be carefully controlled, however, because taking too much can cause vomiting, nausea, tremor, fatigue, slurred speech, and, with severe overdoses, coma or death (Johnson, 2002).

In recent years, some antiseizure medications (such as divalproex [Depakote] or lamotrigine [Lamictal]) have emerged as effective alternatives to lithium in treating bipolar disorder (Selle et al., 2014; Vieta & Valentí, 2013). For some individuals, these medications may be better tolerated, less dangerous at higher doses, and easier to regulate than lithium (Ketter, 2010; Schatzberg et al., 2007).

Tranquilizing Medications (Anxiolytics)

During the 1950s, a new class of medications called **tranquilizers** was shown to reduce mental and physical tension and the symptoms of anxiety. The first of these, meprobamate (Miltown or Equanil), acts somewhat like barbiturate sleeping pills, meaning that overdoses can cause sleep and even death. Because they do not pose this danger, the *benzodiazepines*—particularly chlordiazepoxide (Librium) and diazepam (Valium)—became a popular worldwide choice for anxiety (Stevens & Pollack, 2005). Over time, these and other anti-anxiety medications, also called **anxiolytics** (pronounced “ang-zee-oh-LIT-ix”), became the most widely prescribed and used of all legal drugs (Stevens & Pollack, 2005). Anxiolytics (whose name means “breaking anxiety apart”) have an immediate calming effect and so can help reduce the symptoms of generalized anxiety and posttraumatic stress disorder.

One of the benzodiazepines, alprazolam (Xanax), has become especially popular for helping to relieve the acute anxiety experienced in panic disorder and agoraphobia (Verster & Volkerts, 2004). In some people, though, the benzodiazepines can also cause sleepiness, lightheadedness, and impaired memory and thinking. They can also be quite addictive (Lader, 2011). Combining these medications with alcohol can have additive, and potentially fatal, effects (Chouinard, 2004). Further, suddenly discontinuing benzodiazepines after heavy or long-term use can cause severe withdrawal symptoms, including seizures and worsening anxiety (Lemoine et al., 2006).

While benzodiazepines help reduce anxiousness, they are less helpful in preventing it. An alternative anxiolytic called buspirone (BuSpar) is better at preventing anxiousness. Its effects may not occur for days or weeks after treatment begins, but buspirone can ultimately equal diazepam in reducing generalized anxiety (Gorman, 2003; Rickels & Rynn, 2002). Further, it does not seem to promote dependence, it causes less interference with thinking, and it does not interact so much with alcohol.

Perhaps because anxiety is often accompanied by depression, many antidepressants are also helpful in treating problems such as panic disorder, social phobia, obsessive-compulsive disorder, and posttraumatic stress disorder (e.g., Julien, 2005; Nutt, 2005b). Table 15.3 lists the effects and side effects of some of the psychoactive medications we have described.

tranquilizers (anxiolytics) Medications that reduce tension and symptoms of anxiety.

TABLE 15.3 A SAMPLING OF PSYCHOACTIVE MEDICATIONS USED FOR TREATING PSYCHOLOGICAL DISORDERS

Psychoactive medications have been successful in reducing symptoms of many psychological disorders, but there are limits to their usefulness. They can have troublesome side effects and some may create dependence, especially after years of use (e.g., Breggin, 2008). Further, medications do not "cure" mental disorders (National Institute of Mental Health, 1995), and their effects are not always strong (Kirsch et al., 2002). It is of concern, then, that public perceptions of drug benefits have become unrealistic, leading many people to choose drug treatment over psychotherapies that might offer a more permanent solution to their psychological problems (Mackenzie et al., 2014).

Chemical Name	Trade Name	Effects and Side Effects
For Schizophrenia Spectrum Disorders: Antipsychotics		
Chlorpromazine	Thorazine	Reduce hallucinations, delusions, incoherence, jumbled thought processes; but may cause movement-disorder side effects, including tardive dyskinesia.
Haloperidol	Haldol	
Clozapine	Clozaril	Reduces psychotic symptoms; causes no movement disorders but carries some risk of rare serious blood disease.
Risperidone	Risperdal	Reduces positive and negative psychotic symptoms without risk of blood disease.
Ziprasidone	Geodon	Reduces positive and negative psychotic symptoms without causing weight gain.
Aripiprazole	Abilify	Reduces positive and negative psychotic symptoms without weight gain and with few side effects; can also be effective in some cases of depression.
For Depressive and Bipolar Disorders: Antidepressant Medications and Mood Elevators		
Tricyclics		
Imipramine	Tofranil	Act as antidepressants but also have anti-panic action; cause sleepiness and other moderate side effects; potentially dangerous if taken with alcohol.
Amitriptyline	Elavil, Amitid	
Other Antidepressant Medications		
Fluoxetine	Prozac	All have antidepressant, anti-panic, and anti-obsessive action.
Clomipramine	Anafranil	
Fluvoxamine	Luvox	
Sertraline	Zoloft	
Escitalopram	Lexapro	
Paroxetine	Paxil	
Citalopram	Celexa	
Other Medications		
Lithium carbonate	Carbolith, Lithizine	Calms mania and reduces mood swings of bipolar disorder; overdose harmful, potentially deadly.
	Depakote	
Divalproex	Lamictal	Effective against mania with fewer side effects.
Lamotrigine		Effective in delaying relapse in bipolar disorder; most benefits associated with depression.
For Anxiety Disorders: Tranquilizing Medications (Anxiolytics)		
Benzodiazepines		
Chlordiazepoxide Diazepam	Librium Valium	Act as potent anxiolytics for generalized anxiety, panic, stress; extended use may cause physical dependence and withdrawal syndrome if abruptly discontinued.
Alprazolam	Xanax	Also has antidepressant effects; often used in agoraphobia; has high potential for addiction.
Clonazepam	Klonopin	Often used in combination with other anxiolytics for panic disorder.
Other Anti-Anxiety Agents		
Buspirone	BuSpar	Has slow-acting anti-anxiety action; no known dependence problems.

Human Diversity and Medication

Medications are designed to benefit everyone in the same way, but it turns out that the same psychoactive medication dose can have significantly different effects in each sex and in people from various ethnic groups. For example, Caucasians must take significantly higher doses than Asians of the benzodiazepines, haloperidol, clozapine, lithium, and possibly the tricyclic antidepressants in order to obtain equally beneficial effects (Hull et al., 2001; Ng et al., 2005). In addition, African Americans may show a faster response to tricyclic antidepressants than European Americans and may respond to lower doses of lithium (Chaudhry et al., 2008). There is also some evidence that, compared with European Americans, African Americans and Hispanic Americans might require higher doses of antipsychotics to get the same benefits (Citrome et al., 2005). Some of these ethnic differences may be related to genetically regulated differences in drug metabolism (Kato & Serretti, 2010; Zhang, Lencz, & Malhotra, 2010), whereas others may be due to dietary practices and other sociocultural factors (Bakare, 2008).

Males and females may respond in about the same way to tricyclic antidepressants (Wohlfarth et al., 2004), but women may maintain higher blood levels of these and other therapeutic medications and may show better response to antipsychotics (Hildebrandt et al., 2003; Salokangas, 2004). Women also may be more vulnerable to antipsychotics' adverse side effects, such as tardive dyskinesia (Yarlagadda et al., 2008), but less prone to the cholesterol-related side effects of medications for bipolar disorder (Vemuri et al., 2011). These gender differences in medication response appear less related to estrogen than to other hormonal or body-composition differences between men and women, such as the ratio of body fat to muscle (Dawkins & Potter, 1991; Salokangas, 2004). Continued research on these and other dimensions of human diversity will undoubtedly lead to more effective and safer medications for everyone (Thompson & Pollack, 2001; Vemuri et al., 2011).

Medications and Psychotherapy

Despite their success in treating psychological disorders, psychoactive medications can have drawbacks. As we have seen, some can result in dependence, and side effects can range from minor problems such as the thirst and dry mouth caused by some antidepressants to movement disorders such as tardive dyskinesia caused by some neuroleptics. Although the most serious side effects are relatively rare, some are irreversible, and it is impossible to predict in advance who will develop them. For example, although a clear causal link has not yet been confirmed, the U.S. National Institute of Mental Health (NIMH) and regulatory agencies in Canada and Britain have issued warnings about the danger of suicidal behavior in children and adolescents who are given Prozac and similar antidepressants (National Institute of Mental Health, 2004; Olfsen, Marcus, & Shaffer, 2006; Stone et al., 2009). There is also concern about how effective psychoactive medications truly are, dampening the enthusiasm that once led many clinical psychologists to seek prescription privileges (Greenberg, 2010).

So which is better: medications or psychotherapy? Although occasionally a study shows that one form of treatment or the other is more effective, neither has been shown to be clearly superior overall for treating problems such as anxiety disorders and major depressive disorder (Forand et al., 2013; Huhn et al., 2014; Stewart & Harkness, 2012). For example, studies of treatment for severe depression have found that antidepressants, behavior therapy, cognitive behavior therapy, and interpersonal psychotherapy are equally effective (e.g., Butler et al., 2006; Dimidjian et al., 2006; Stewart & Harkness, 2012). Cognitive behavior therapy and medications are equally effective in phobias (e.g., Clark et al., 2003; Davidson et al., 2004), panic disorder (Barlow, 2007), generalized anxiety disorder (Mitte, 2005a), and obsessive-compulsive disorder (Kozak, Liebowitz, & Foa, 2000).

What about combining medications and psychotherapy? Research suggests that doing so can sometimes be helpful (Addington, Piskulic, & Marshall, 2010). Combined

There is concern that we rely too heavily on medications to treat psychological problems, partly because of pharmaceutical ads that fuel consumer demand (Albee, 2002; Breggin, 2008). In one case, for example, increasing doses of medication failed to stop a patient with paranoid schizophrenia from repeatedly escaping from a mental hospital. The problem was solved without drugs, though, after a psychologist discovered that the man's escapes were motivated by his fear of calling his mother on "bugged" hospital phones, and he was allowed to use a telephone at a nearby shopping mall (Rabasca, 1999).

Frank Cotham/Cartoon Bank.com



treatment is recommended in cases of bipolar disorder (Vieta et al., 2011) and produces slightly better results than either psychotherapy or medications alone in people suffering from severe, long-term depression (Hegerl, Plattner, & Moller, 2004). The combination of medications and psychotherapy has also been shown to be more effective than either method alone in treating attention deficit hyperactivity disorder, childhood anxiety disorders, obsessive-compulsive disorder, alcoholism, stammering, eating disorders, compulsive sexual behavior, posttraumatic stress disorder, and panic disorder (e.g., Barlow, 2007; Flament, Bissada, & Spettigue, 2012; Sheerin, Seim, & Spates, 2012; Walkup et al., 2008).

The combined approach may be especially useful for people who are initially too distressed to benefit much from psychotherapy. A related approach, already shown to be successful with people who had been taking medications for panic disorder and depression, is the use of psychotherapy to prevent relapse and to make further progress as medications are discontinued (e.g., Dobson et al., 2008; Klein et al., 2004). Evidence also suggests that a drug called D-cycloserine might be helpful in preventing the reappearance of fears being extinguished through exposure techniques or other forms of behavior therapy (Choy, Fyer, & Lipsitz, 2007; Norberg, Krystal, & Tolin, 2008). And when combined with cognitive behavior therapy, D-cycloserine also shows promise for treating obsessive-compulsive disorder, posttraumatic stress disorder, generalized anxiety, and schizophrenia (Cain et al., 2014; Difede et al., 2014; Hoffman, Fang, & Gutner, 2014; Mataix-Cols et al., 2014).

It has recently been suggested that certain hormones may enhance the effects of psychotherapy. Of particular interest is oxytocin, a hormone that may help play a role in developing social connections early in life (MacDonald et al., 2013). Scientists are exploring the question of whether combining oxytocin with psychotherapy might amplify treatment benefits for disorders that involve troubled social relationships. Some studies have found, for example, that the use of oxytocin in conjunction with evidence-based psychological treatments has been associated with symptom improvement in autism spectrum disorder and depression (Harris & Carter, 2013; MacDonald et al., 2013).

However, combining medication with psychotherapy may not always be the best approach. One early study compared the effects of a form of *in vivo* desensitization called *gradual exposure* and an anti-anxiety medication (Xanax) in the treatment of agoraphobia. Clients who received gradual exposure alone showed better short- and long-term benefits

than those who received either the medication alone or a combination of the medication and gradual exposure (Echeburua et al., 1993). A more conservative strategy for treating most cases of anxiety and depression is to begin with cognitive or interpersonal psychotherapy (which have no major negative side effects) and then add or switch to medication if psychotherapy alone is ineffective (Forand et al., 2013). Often, people who do not respond to one method will be helped by the other (Heldt et al., 2006). Someday, research may offer better guidelines about who should be treated with psychotherapy alone, medication alone, or a combination of the two (Hollon et al., 2005; Practice Guidelines, 2011).

LINKAGES

BIOLOGICAL ASPECTS OF PSYCHOLOGY AND THE TREATMENT OF PSYCHOLOGICAL DISORDERS

LINKAGES How do psychoactive medications work? (a link to Biological Aspects of Psychology)

Human feelings, thoughts, and actions—whether normal or abnormal—are ultimately the result of biological processes, especially those involving neurotransmitters and their receptors in the brain. Because different neurotransmitters are especially prominent in particular circuits or regions of the brain, altering the functioning of particular neurotransmitter systems can have relatively specific psychological and behavioral effects.

Let's consider some of the ways that therapeutic psychoactive medications affect neurotransmitters and their receptors. Some therapeutic medications cause neurons to fire, whereas others reduce, or inhibit, firing. For example, benzodiazepines (e.g., Valium and Xanax) exert their anti-anxiety effects by helping the inhibitory neurotransmitter GABA bind to receptors and thus suppress neuron firing. This increased inhibitory effect acts as a sort of braking system that slows the activity of GABA-sensitive neurons involved in the experience of anxiety. However, benzodiazepines also slow the action of all neural systems that use GABA, including those associated with motor activity and mental processing, which are spread throughout the brain. The result is the decreased motor coordination and clouded thinking that can appear as the side effects of the benzodiazepines. It might soon be possible to develop medications that will bind only to certain kinds of GABA receptors and thus greatly reduce these side effects (Gorman, 2005).

LINKAGES How do medications help people who suffer from schizophrenia? (a link to Biological Aspects of Psychology)

Other therapeutic medications are receptor antagonists (see Figure 9.8 in the consciousness chapter), acting to block the receptor site normally used by a particular neurotransmitter. Most antipsychotics, for example, exert their effects by blocking receptors for dopamine, a neurotransmitter that is important for movement, as described in the chapter on biological aspects of psychology. Blocking dopamine seems to reduce the jumbled thinking of many schizophrenia patients, but it can create problems—including tardive dyskinesia—in the movement systems that are also controlled by dopamine.

Some psychoactive medications exert a therapeutic influence by affecting the amount of a neurotransmitter available to act on receptors. One way for such an effect to occur is by slowing a process called *reuptake*, through which the neurotransmitter would normally return to the brain cell from which it was released. The tricyclic antidepressants, for example, operate by slowing the reuptake of norepinephrine. Prozac, Anafranil, and some other antidepressants are called *selective serotonin reuptake inhibitors (SSRIs)* because they slow the reuptake of serotonin. Others, such as Effexor, slow the reuptake of both serotonin and norepinephrine.

COMMUNITY PSYCHOLOGY

How can we prevent psychological disorders?

It has long been argued that even if psychologists and psychiatrists knew exactly how to treat every psychological problem, there would never be enough mental health professionals to help everyone in need (Albee, 1968, 2006). A study by the World Health Organization



Community Mental Health Efforts

Professional and nonprofessional staff members at community mental health centers provide traditional therapy and mental health education as well as walk-in facilities and hotlines for people who are suicidal or in crisis because of rape or domestic violence. They also offer day treatment to former mental patients, many of whom are homeless.

Geri Engberg/The Image Works

community psychology An approach to minimizing or preventing psychological disorders by promoting social change and community mental health programs.

found, for example, that even individuals with severe mental health problems often do not receive the psychological services they need (Alonso, Chatterji, & He, 2013). One study revealed that the treatment situation is especially dire in poorer countries where only about 11 percent of psychologically troubled individuals had received treatment for their disorders. In "high-income" countries such as the United States and Belgium, the figure was about 60 percent (Wang et al., 2007; see also Gonzalez et al., 2010). Even in high-income countries, though, mental health problems are more common among individuals who are poor, so the people who most need psychological treatment are often the ones least likely to receive it (van Oort et al., 2011).

Recognition of this treatment access problem helped fuel the rise of **community psychology**, which seeks to treat people in their local communities, raise people's awareness and understanding of mental health problems, and work for social changes that can prevent psychological disorders (Jorm, 2012; Nelson & Prilleltensky, 2004).

One aspect of community psychology, the *community mental health movement*, appeared during the 1960s as an attempt to make treatment available to people in their own communities. As antipsychotics became available and as concern grew that patients were not improving (and might be getting worse) after years of confinement in mental hospitals, thousands of these patients were released. The plan was for them to receive medications and other mental health services in newly funded community mental health centers. This *deinstitutionalization* process spared patients the boredom and isolation of the hospital environment, but the mental health services available in the community never matched the need for them (Dalton et al., 2013). Some

former hospital patients and many people whose disorders might once have sent them to mental hospitals are now living in halfway houses and other community-based facilities where they receive *psychosocial rehabilitation*. These community support services are not designed to "cure" them but to help them cope with their problems and develop the social and occupational skills necessary for semi-independent living (Coldwell & Bender, 2007). Too many others with severe psychological disorders did not receive or respond to rehabilitation and are to be found enduring the dangers of homelessness on city streets or of confinement in jails and prisons (Luhrmann, 2008; Smith & Sederer, 2009).

Community psychology also attempts to prevent psychopathology by addressing unemployment, poverty, overcrowded substandard housing, and other stressful social situations that may put vulnerable people at greater risk for some disorders (Dalton et al., 2013; Fagan et al., 2009). Less ambitious but perhaps even more significant are efforts to detect psychological problems in their earliest stages and keep those problems from becoming worse. Some examples include encouraging positive lifestyle changes (Walsh, 2011), prevention of depression and suicide and posttraumatic stress disorder (Gates et al., 2012; Gillham et al., 2007; Shalev et al., 2012); programs (including Project Head Start) that help preschoolers whose backgrounds hurt their chances of doing well in school and put them at risk for failure and delinquency (Foster et al., 2006; Shaw et al., 2006); and identification of children who are at risk for disorder because of parental divorce, poverty, or because they are rejected or victimized at school (e.g., Cappella et al., 2012; Martinez & Forgatch, 2001). Other interventions are designed to head off conduct problems, anxiety disorders, or schizophrenia in children and adults (McGilloway et al., 2012; Neil & Christensen, 2009; Rapee et al., 2005); to prevent domestic violence, dating violence, and child abuse (Miller et al., 2012; Whitaker et al., 2006); and to promote health consciousness in ethnic minority communities (Borg, 2002).

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of the psychopharmacology of medication illustrates just one way that the topic of this chapter, treatment of psychological disorders, is linked to the subfield of biological psychology, which is described in the chapter on biological aspects of psychology. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 15 Treatment of Psychological Disorders



LINKAGES

How do psychoactive medications work?



CHAPTER 3
Biological Aspects
of Psychology

Can people learn their way out
of a disorder?



CHAPTER 5
Learning

How can people manage
stress?



CHAPTER 12
Health, Stress, and Coping

SUMMARY

Basic Features of Treatment

What features do all treatment techniques have in common?

Psychotherapy is usually based on psychodynamic, humanistic, or behavioral theories of personality and behavior disorder. Many therapists employ elements of more than one approach. The biological approach uses medications and other physical treatment methods.

All forms of treatment include a client, a therapist, a theory of behavior disorder, a set of treatment procedures suggested by the theory, and a special relationship between the client and therapist. Therapy may be offered to inpatients and outpatients in many different settings by **psychologists**, **psychiatrists**, and other helpers. The goal of treatment is to help people change their thinking, feelings, and behavior so that they will be happier and function better.

Psychodynamic Psychotherapy

How did Freud get started as a therapist?

Psychodynamic psychotherapy began with Freud's **psychoanalysis**, which seeks to help clients gain insight into unconscious conflicts and impulses and then to explore how those factors have created disorders. Exploration of the unconscious is aided by the use of free association, dream interpretation, and related methods. Some variations on psychoanalysis retain most of Freud's principles but are typically shorter in duration and tend to stress social and interpersonal factors, such as early relationships with caregivers.

Humanistic Psychotherapy

Why won't some therapists give advice?

Humanistic psychotherapy helps clients become more aware of discrepancies between their feelings and their behavior. According

to the humanistic approach, these discrepancies are at the root of behavior disorders and can be resolved by the client once they are brought to light in the context of a genuine, trusting relationship with the therapist.

Therapists using Rogers's ***client-centered therapy***, also known as ***person-centered therapy***, help mainly by adopting attitudes toward the client that express ***unconditional positive regard, empathy, and congruence*** to create a nonjudgmental atmosphere. Therapists employing the ***Gestalt therapy*** of Fritz and Laura Perls use more active techniques than Rogerian therapists, often pointing out inconsistencies between what clients say and how they behave.

Behavior Therapy and Cognitive Behavior Therapy

Can we learn to conquer fears?

Behavior therapy and ***behavior modification*** apply learning principles to eliminate undesirable behavior patterns and strengthen more desirable alternatives. The methods they employ include ***systematic desensitization therapy, modeling, assertiveness training*** and social skills training, ***positive reinforcement*** (sometimes within a ***token economy program***), ***extinction*** techniques (such as ***flooding or implosive therapy***), ***aversion conditioning***, and ***punishment***.

Many behavior therapists also employ ***cognitive behavior therapy*** to help clients alter the way they think as well as the way they behave. Among the specific cognitive behavioral methods are ***rational-emotive behavior therapy (REBT)***, cognitive restructuring, stress inoculation training, and ***cognitive therapy***.

Group, Family, and Couples Therapy

How does group psychotherapy differ from individual therapy?

Therapists of all theoretical persuasions offer ***group psychotherapy, family therapy, and couples therapy***. These forms of treatment take advantage of relationships in the group, family, or couple to enhance the effects of treatment.

Evaluating Psychotherapy

How effective is psychotherapy?

Research has found that clients who receive psychotherapy are better off than most clients who receive no treatment, but that no

single approach is uniformly better than all others for all clients and problems. Still, some methods appear effective enough in the treatment of particular disorders to have been listed as ***empirically supported therapies (ESTs)*** that can guide ***evidence-based practice***. The outcome of treatment is also affected by the characteristics of the client and the therapist and the relationship that develops between them. Several factors, including personal preferences, must be considered when choosing a form of treatment and a therapist. The effects of cultural differences in the values and goals of therapist and client have also attracted increasing attention. In all forms of treatment and under all but the most exceptional circumstances, the client's rights include the right to confidentiality.

Biological Treatments

Is electric shock still used to treat psychological disorders?

Biological treatment methods seek to relieve psychological disorders by physical or pharmaceutical means. ***Psychosurgery*** procedures once involved mainly prefrontal lobotomy; when used today, usually as a last resort, they focus on more limited areas of the brain.

Electroconvulsive shock therapy (ECT) involves passing an electric current through the patient's brain, usually in an effort to relieve severe depression. Today, the most prominent form of biological treatment involves psychoactive medications, including those with ***antipsychotic, antidepressant, or tranquilizing (anxiolytic)*** effects. Psychoactive medications appear effective in many cases, but critics point out that a number of undesirable side effects are associated with these medications. Medications may be no more effective than some forms of psychotherapy for many people. Combining medication and psychotherapy may help in some cases and in the treatment of certain disorders, but their joint effect may be no greater than the effect of either one alone.

Community Psychology

How can we prevent psychological disorders?

The realization that there will never be enough therapists to treat all who need help prompted the development of ***community psychology***. Community mental health programs and efforts to prevent mental disorders are the two main elements of community psychology.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. Claudia's therapist asks her to talk about whatever thoughts, memories, or ideas come into her mind. He asks her not to "edit" any of her thoughts. This technique is called _____ and is part of _____ therapy.
 - a. reflection; psychodynamic
 - b. reflection; humanistic
 - c. free association; psychodynamic
 - d. free association; humanistic
2. Vicki tells Dr. Denter, her therapist, that she is very happy in her marriage. Dr. Denter points out that as she says this, she is clenching her fist. He asks her to have a dialogue with herself by "becoming" her fist and saying what it would say to her. Dr. Denter is most likely a _____ therapist.
 - a. Gestalt
 - b. psychodynamic
 - c. behavior
 - d. cognitive
3. Melinda is a licensed clinical psychologist, which means she probably has _____.
 - a. a doctoral degree in psychology
 - b. a psychodynamic approach to therapy
 - c. the right to prescribe medications in most U.S. states
 - d. a medical degree
4. A primary aim of classical psychoanalysis is to _____.
 - a. help clients get in touch with their current feelings
 - b. help clients gain insight into their unconscious conflicts
 - c. replace clients' problematic behaviors with more desirable behaviors
 - d. teach clients new ways of thinking
5. Dr. Margent listens as her client, Eric, talks at length about his problems at work, including the fact that he hates his job, often sneaks out early, sometimes ignores his manager's instructions, and generally avoids working hard. Dr. Margent doesn't interrupt or criticize him but often rephrases what he says to be sure she understands it. Dr. Margent is using methods most closely associated with _____ therapy.
 - a. psychodynamic
 - b. behavioral
 - c. client-centered
 - d. cognitive-behavioral
6. Carl's therapist is helping him overcome his fear of heights by imagining increasingly frightening images while he is relaxed. The therapist is using methods known as _____.
 - a. assertion training
 - b. systematic desensitization therapy
 - c. flooding
 - d. modeling
7. Shanobi is tearfully telling a friend that she is depressed and does not know why. Her friend says, "You seem so unhappy, and maybe a bit scared, too." The friend's response is most like which method used in client-centered therapy?
 - a. sympathy
 - b. empathy
 - c. reflection
 - d. actualization
8. Rebecca is convinced that she will never get the promotion she wants because she "is just not good at job interviews." Her therapist asks her to close her eyes and say the first thing that comes into her mind as she thinks about her job. He also asks Rebecca for details of the dreams she has been having lately. Rebecca's therapist appears to prefer the _____ approach to treatment.
 - a. behavioral
 - b. cognitive behavioral
 - c. Gestalt
 - d. psychodynamic
9. Brandon complains that he has an intense need to touch all four walls of any room he enters for the first time. His therapist suggests that Brandon might have learned this compulsive behavior because it helped him avoid anxiety. The therapist appears to favor the _____ approach to treatment.
 - a. psychodynamic
 - b. humanistic
 - c. behavioral
 - d. neurobiological
10. Your friend Rallo is considering entering psychotherapy, but he wonders if it will help. Based on the research you read about in this chapter, you tell Rallo that _____.
 - a. therapy does not help the average client
 - b. therapy helps the average client
 - c. humanistic therapies are most effective overall
 - d. there is no experimental research on the effectiveness of therapy

- 11.** According to the American Psychological Association's *Ethical Principles of Psychologists and Code of Conduct*, a therapist may reveal information learned about a client during therapy if _____.
a. the client's employer requests this information in confidence
b. the client drops out of therapy
c. the client is suicidal and needs immediate hospitalization
d. the therapist feels it will do no harm
- 12.** Juanita is trying to influence her state legislature to pass laws that will help prevent psychological problems caused by malnutrition, overcrowding, and homelessness. She is most likely a _____ psychologist.
a. behavioral
b. community
c. humanistic
d. psychodynamic
- 13.** Rafer's intense fear of spiders greatly interferes with his job as a forest ranger. His therapist suggests that he stay in a room full of harmless spiders until he feels no further anxiety. This therapy technique is known as _____.
a. flooding
b. punishment
c. systematic desensitization therapy
d. aversion conditioning
- 14.** Sally constantly tells herself that she is "worthless" and "will never succeed at anything." Her therapist helps her practice new thoughts such as "I'm as good as the next person" and "I am going to try my best." Her therapist is using the technique of _____, which is part of _____ therapy.
a. free association; psychodynamic
b. reflection; humanistic
c. stress inoculation; behavioral
d. cognitive restructuring; cognitive behavior
- 15.** Lucinda is experiencing severe depression that leaves her unable to enjoy life. She has not responded to psychotherapies or antipsychotic medication. Lucinda would be a candidate for _____.
a. neuroleptic medications
b. ECT
c. aversion conditioning
d. cognitive restructuring
- 16.** Therapeutic medications can work in many ways, but *not* by _____.
a. increasing the amount of neurotransmitters released in the brain
b. decreasing the amount of neurotransmitters released in the brain
c. blocking the action of neurotransmitters in the brain
d. changing the kind of neurotransmitters released by neurons in the brain
- 17.** An important common element in the success of many forms of psychotherapy is _____.
a. the client-therapist relationship
b. randomly assigning therapists to clients
c. having a therapist trained in a variety of therapeutic methods
d. having appropriate assessment methods to measure outcomes
- 18.** When prescribing neuroleptic medications for schizophrenia, psychiatrists must consider that patients may _____.
a. become addicted to them
b. become insensitive to them after an extended period of time
c. develop tardive dyskinesia
d. experience hallucinations after extensive use
- 19.** Jon's therapist has prescribed anxiolytics for him. Jon is probably being treated for _____.
a. depression
b. an anxiety disorder
c. schizophrenia
d. somatoform disorder
- 20.** Which of the following is *not* an advantage of group psychotherapy?
a. It allows the therapist to observe clients interacting with one another.
b. Clients learn from one another.
c. Clients improve more quickly.
d. Clients feel less alone.

Social Psychology



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Preview

If you are like most people, there is probably at least one thing you do in private that you would never do when someone else is around. The tendency to behave differently when others are present is just one aspect of social psychology. This chapter describes many other ways that the presence and behavior of other people affect our own thoughts and actions and how we, in turn, affect the thoughts and actions of others. It explores how perception, learning, memory,

thinking, and emotion occur in relation to other people; how people think about themselves and others; why we may like one person but dislike another; how people form and change attitudes; and why and how we judge other people, sometimes in biased ways. Social pressure, ranging from unspoken social rules to commands for obedience, is another concern of social psychologists. The chapter also reviews some of the helpful, cooperative, competitive, and aggressive ways in which people behave toward one another in the workplace and in other social situations. Finally, it considers group decision making and other group processes.

On April 15, 2013, Tamerlan and Dzhokhar Tsarnaev, two brothers who had lived in the United States for most of their lives, left powerful backpack bombs among hundreds of spectators near the finish line of the Boston Marathon. When the bombs exploded, 3 people were killed and 264 others were injured. Similar acts of terrorism have cost the lives of many thousands of people in the United States and around the world. Almost all of the questions that can be asked about terrorism relate to human behavior. For example, what could lead someone to try to kill and injure innocent people because of political or religious beliefs? Why do firefighters, police officers, emergency medical workers, and other first responders risk their own lives to save the lives of terrorism victims? Why do some people flee the scene of an attack, while others stay to tend to wounded strangers? Is there any reason to hope that the hatred, distrust, and extremism that underlie terrorist attacks can someday be reduced or eliminated?

We may never have final answers to such questions as these, but some partial answers may lie in the study of **social psychology**, the scientific investigation of how people's thoughts and feelings influence their behavior toward others and how the behavior of others influences people's own thoughts, feelings, and behavior. In this chapter, we focus on several topics in social psychology, including **social cognition**, the mental processes associated with how people perceive and react to other individuals and groups (Fiske & Taylor, 2008), and group and interpersonal behaviors such as conformity, aggression, and helping. One important aspect of social cognition is how it affects the way we see ourselves.

SOCIAL INFLUENCES ON THE SELF

How do we compare ourselves with others?

Each of us lives in both a personal and a social world. This means that although you experience your thoughts and feelings as your own, they have been strongly influenced by other people.

The thoughts, feelings, and beliefs about what characteristics you have and who you are make up your **self-concept**. Although your self-concept is unique to you, it is a product of your social and cultural environment. In the chapters on human development and personality, we describe how each individual develops within a cultural context and how collectivist and individualist cultures emphasize different core values and encourage contrasting definitions of the self. As you will see in this chapter, culture also provides the context for **self-esteem**, the evaluations you make of your worth as a human being (Crocker & Canevello, 2012). Let's look at how self-esteem develops.

Social Comparison

People spend a lot of time thinking about themselves, trying to evaluate their own perceptions, opinions, values, abilities, and so on (Epstude & Mussweiler, 2009). Self-evaluation involves two distinct types of questions: those that can be answered objectively and those that cannot (Festinger, 1954). You can determine your height or weight by measuring it, but for other types of questions—about your creativity or attractiveness, for example—there are no objective criteria. According to Leon Festinger's theory of **social comparison**,

social psychology The subfield of psychology that explores the effects of the social world on the behavior and mental processes of individuals and groups.

social cognition Mental processes associated with people's perceptions of and reactions to other people.

self-concept The way one thinks of oneself.

self-esteem The evaluations people make about their worth as human beings.

social comparison Using other people as a basis of comparison for evaluating oneself.

people evaluate themselves in relation to others. When you use others as a basis for evaluating how intelligent, athletic, interesting, or attractive you are, you engage in social comparison (Dijkstra, Gibbons, & Buunk, 2010; Freund & Kasten, 2012).

Who serves as your basis of comparison? Festinger said that people usually look to others who are similar to themselves. For example, if you are curious about how good you are at swimming or science, you'll probably compare yourself with people who are at about your own level of experience and ability, not with Olympic champions or Nobel Prize winners (Aronson, Wilson, & Akert, 2013). The categories of people you feel you belong to and usually compare yourself with are called your **reference groups**.

The performance of individuals in your reference groups can affect your self-esteem (Crocker & Canevello, 2012). If being good at science is important to you, for example, knowing that someone in your reference group always scores much higher than you on science tests can lower your self-esteem. To protect their self-esteem and make themselves feel better, people sometimes compare themselves with those who are not as good, a strategy called *downward social comparison*. They may also sometimes engage in *upward social comparison*, in which they compare themselves with people who are doing much better than they are (John, Lowenstein & Rick, 2014). At first glance, this might not seem sensible, but upward social comparison can create optimism about improving our own situations (Wheeler & Suls, 2007). We may tell ourselves "If they can do it, so can I!" (Buunk, Peiró, & Griffioen, 2007). Or we might tell ourselves that the superior performer is not really similar enough to be in our reference group or even that the ability in question is not that important to us (Dijkstra, Gibbons, & Buunk, 2010).

An unfavorable comparison of your own status with that of others can produce a sense of *relative deprivation*—the belief that no matter how much you are getting in terms of recognition, status, money, and other rewards, it is less than you deserve (Kassin, Fein, & Markus, 2014). The concept of relative deprivation explains why employees become dissatisfied when they consider themselves underpaid or underappreciated in comparison to their coworkers (Ren, Bolino, Shaffer, & Kraimer, 2013). When large groups of people experience relative deprivation, political unrest may follow (de la Sablonnière, Tougas, & Lortie-Lussier, 2009). It is likely, for example, that resentment over U.S. prosperity and global influence plays a role in creating the hatred that leads some people to engage in terrorist attacks against the United States (Brewer, 2010).

FOCUS ON RESEARCH METHODS

SELF-ESTEEM AND THE ULTIMATE TERROR

Why is self-esteem so important to so many people? An intriguing answer to this question comes from the *terror management theory* proposed by Jeff Greenberg, Tom Pyszczynski, and Sheldon Solomon (Solomon, Greenberg, & Pyszczynski, 2004). This theory is based on the notion that humans are the only creatures capable of thinking about the future and realizing that we will all eventually die. Terror management theory suggests that humans cope with anxiety, including the terror that thoughts about death might bring, by developing a variety of self-protective psychological strategies. One strategy is to establish and maintain high self-esteem (Greenberg, Solomon, & Arndt, 2008; Pyszczynski et al., 2010).

What was the researchers' question?

In a series of experiments, Greenberg and his colleagues (1992) asked whether high self-esteem serves as a buffer against anxiety—specifically, the anxiety brought on by thoughts about death and pain.

(continued)

reference groups Categories of people with whom individuals compare themselves.

How did the researchers answer the question?

About 150 students at several North American universities participated in these studies, each of which followed a similar format. The first step was to temporarily alter the participants' self-esteem. To do so, the researchers gave the students feedback about a personality or intelligence test they had taken earlier in the semester. Half the participants received positive feedback designed to increase their self-esteem. The other half received feedback that was neutral—it was neither flattering nor unflattering. (Measurements showed that the positive feedback actually did create higher self-esteem than the neutral feedback.) In the next phase of each experiment, the researchers used either a film about death or the (false) threat of a mild electric shock to provoke some anxiety in half the participants in the positive-feedback group and half the participants in the neutral-feedback group. The amount of anxiety created was measured by the participants' self-reports or by monitoring galvanic skin resistance (GSR), a measure of perspiration in the skin that reflects anxiety-related physiological arousal (Dawson, Schell, & Filion, 2000).

What did the researchers find?

Self-reports and GSR measures revealed that participants in all three experiments were significantly less upset by an anxiety-provoking experience (the death film or the threat of shock) if they had first received esteem-building feedback about their previous test performance. Other studies have reported similar findings (Schmeichel et al., 2009).

What do the results mean?

The researchers concluded that their results support the notion that self-esteem can act as a buffer against anxiety and other negative feelings. This conclusion would help explain why people are so eager to maintain or enhance their self-esteem (Leary, 2010; Loughnan et al., 2011): we don't like to feel anxious, and increased self-esteem reduces most people's anxiety.

What do we still need to know?

These results certainly support terror management theory, but by themselves they're not broad enough to confirm all of its assumptions. For example, the theory also predicts that when people are sensitized to the threat of death, they will seek to protect themselves by suppressing thoughts of death and by doing things that increase the approval and support of others in their society (Baka, Derbis, & Maxfield, 2012; Goncalves Portelinha et al., 2012). Consistent with this prediction, people have been found to make larger contributions to charity after being made more aware of their own mortality (Wade-Benzoni et al., 2012). Similarly, dramatic increases in volunteering for charity work occurred after the terrorist attacks of 9/11 (Penner, Brannick et al., 2005).

But not everyone reacts with prosocial behavior when sensitized to the threat of death. The greatest increase in prosocial behavior following reminders about death appears in people who value prosocial behavior (Joireman & Durell, 2007). In other people, those same reminders may be followed by a *reduction* in humanitarian concerns (Hirschberger, 2009). Social psychologists would like to know more about how people's values and personality characteristics are related to the strategies they adopt when dealing with the threat of death.

Researchers also wonder whether terror management theory offers the best explanation of why high self-esteem reduces anxiety. Perhaps people value self-esteem not because it makes them less afraid of death but simply because it is a flattering indicator (a sort of "sociometer") of their acceptance by others (Leary, 2010). According to sociometer theory, people want to have high self-esteem because it tells them that they are liked and accepted. Perhaps the goal of acceptance evolved because people who were excluded from the protective circle of their group were not likely to survive to reproduce. Compared with terror management theory, sociometer theory is certainly a simpler and more plausible explanation of the desire for high self-esteem, but is it the best explanation? Both theories make similar predictions about the effects of self-esteem on anxiety, so it will take additional research to evaluate their relative merits.

TRY THIS

Social Identity Theory

Take a moment to complete the following sentence: I am a(n) _____. Did you fill the blank with something like “good athlete” or “honor student,” or did you insert something like “woman” or “Hispanic American?” The first type of response reflects *personal identity*, something about one’s individuality, while the second reflects **social identity**, the beliefs we hold about the groups to which we belong. Our social identity is therefore a part of our self-concept (Hogg, 2012).

Our social identity permits us to feel part of a larger whole (Bryant & Cummins, 2010). We see its importance in the pride people feel when a member of their family graduates from college or when a local team wins a big game (Kassin, Fein, & Markus, 2014). In wars between national, ethnic, or religious groups, individuals sacrifice and sometimes die for the sake of their group identity (Swann et al., 2014). A group identity is also one reason people donate money to those in need, support friends in a crisis, and display other forms of prosocial behavior. Many factors may affect the strength of our group identity. For instance, thinking about the challenges and difficulties our own group has overcome tends to strengthen our identification with that group (Ersner-Hershfield et al., 2010). As we shall see later, however, defining ourselves in terms of a group identity can foster an “us versus them” mentality that sets the stage for prejudice, social discrimination, intergroup conflict, and even terrorism (Hogg & Adelman, 2013).

SOCIAL PERCEPTION

Do we perceive people and objects in similar ways?

LINKAGES Do we sometimes perceive people the same way we perceive objects? (a link to Sensation and Perception)

There’s a story about a company president who was having lunch with a man being considered for an executive position. When the man salted his food without first tasting it, the president decided not to hire him. The reason, she explained, was that the company had no room for a person who acted before collecting all relevant information. The candidate lost his chance because of the president’s **social perception**, the processes through which people interpret information about others, form impressions of them, and draw conclusions about the reasons for their behavior. In this section, we examine how and why social perception influences our thoughts, feelings, and actions.

The Role of Schemas

The ways in which we perceive people follow many of the same laws that govern how we perceive objects, including the Gestalt principles discussed in the chapter on sensation and perception (Macrae & Quadflieg, 2010). Consider Figure 16.1. Consistent with Gestalt principles, most people would describe it as “a square with a notch in one side,” not as eight straight lines (Woodworth & Schlosberg, 1954). The reason is that they interpret new information using the mental representations, or **schemas**, that they already have about squares (Aronson, Wilson, & Akert, 2013). In other words, they interpret this diagram as a square with a slight modification.

We have schemas about people, too, and they can affect our perceptions. For one thing, schemas influence what we pay attention to and what we ignore. We tend to process information about another person more quickly if it confirms our beliefs about that person’s gender or ethnic group, for example, than if it violates those beliefs (Betz & Sekaquaptewa, 2012; Carlston, 2010). Schemas also influence what we remember about others (Carlston, 2010). In one study, if people thought a woman they saw in a video was a waitress, they recalled that she had a beer with dinner and owned a TV set. Those who thought she was a librarian remembered that she was wearing glasses and liked classical music (Cohen, 1981). We also tend to remember people who violate our schemas. In another study, researchers showed pictures of men and women and told a little story about each, including whether the pictured people had cheated on their romantic partners. Many people hold schemas suggesting that women are kinder and less self-centered than men, so participants were better at remembering pictures of cheating women than of cheating

FIGURE 16.1
A Schema-Plus-Correction

People who see an object like this tend to use a preexisting mental representation (their schema of a square) and then correct or modify it in some way (here, with a notch).



May I Help You?

Schemas help us quickly categorize people and respond appropriately to them, but schemas can also create narrow-mindedness and (as we shall see later) social prejudice. If this woman does not fulfill your schema—your mental representation—of how carpenters are supposed to look, you might be less likely to ask her for advice on your home improvement project. One expert carpenter who manages the hardware department of a large home improvement store told us that most customers walk right past her in order to ask the advice of one of her less-experienced male clerks.

Tanya Constantine/Blend Images/Alamy

men (Kroneisen & Bell, 2013). Schemas can also affect our judgment about the actions of others (Moskowitz, 2005). For instance, people may be less likely to blame a defendant in a rape case if their schema about rape victims includes the myth that their appearance or behavior makes them partially responsible for being attacked (Eyssel & Bohner, 2011).

In other words, our schemas about people influence our perceptions of them through the top-down processing that is discussed in the chapter on sensation and perception. And just as schemas help us read sentences that contain words with missing letters, they also allow us to efficiently “fill in the blanks” about people. Our schemas tell us, for example, that someone wearing a store uniform or name tag is likely to know where merchandise is located, so we usually approach that person for assistance. Accurate schemas help us categorize people quickly and respond appropriately in social situations, but if schemas are incorrect they can create false expectations and errors in judgment about people that can lead to narrow-mindedness and even prejudice.

First Impressions

Our schemas about people act as lenses that alter our first impressions of them. Those impressions, in turn, affect both our later perceptions of their behavior and our reactions to it. First impressions are formed quickly, usually change slowly, and typically have a long-lasting influence. No wonder they’re so important in the development of social relations (Kassin, Fein, & Markus, 2014). How do people form impressions of other people? And why are these impressions so resistant to change?

Forming Impressions

TRY THIS Think about your first impression of a close friend. It was probably formed quickly, because existing schemas create a tendency to automatically assume a great deal about a person on the basis of limited information (Uleman & Saribay, 2013). In fact, people can make surprisingly accurate judgments about a person’s trustworthiness, competence, or leadership abilities after seeing a person’s face for only a tenth of a second (Rule et al., 2011; Willis & Todorov, 2006). First impression judgments become even more accurate after as little as one minute of exposure to a new person (Ames et al., 2010), and although our judgments of more attractive people tend to be more accurate—perhaps because we spend more time looking at them (Lorenzo, Biesanz, & Human, 2010; Stirrat & Perrett, 2010)—we are not influenced by appearance alone. We’re often swayed, too, by a person’s handshake or use of language (Bernieri & Petty, 2011; Douglas & Sutton, 2010). And a distinctive or unusual name, for example, might cause us to draw inferences about the person’s religion, ethnicity, food preferences, or temperament (Gebauer, Leary, & Neberich, 2011). Clothing or hairstyle might lead us to make assumptions about political views or taste in music (Brown et al., 2013). These inferences and assumptions may or may not be accurate. How many turned out to be true in your friend’s case?



Noticeable features or actions help shape our impressions of others. Those impressions may or may not be correct (Biesanz et al., 2011; Human & Biesanz, 2012; Vartanian et al., 2012).

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Self-Fulfilling Prophecies in the Classroom

If teachers inadvertently spend less time helping children who at first seem "dull," those children may not learn as much, thus fulfilling the teachers' expectations. If this girl has not impressed her teacher as being very bright, how likely do you think it is that she will be called on during class?

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One schema has a particularly strong influence on first impressions: We tend to assume that the people we meet have attitudes and values similar to our own (Srivastava, Guglielmo, & Beer, 2010). So all else being equal, we're inclined to like other people. However, even a small amount of negative information can change our minds. Why? The main reason is that most of us don't expect other people to act negatively toward us. When unexpected negative behaviors do occur, they capture our attention and lead us to believe that these behaviors reflect something negative about the other person (Aronson, Wilson, & Akert, 2013). As a result, negative information attracts more attention and carries more weight than positive information in shaping first impressions (Dickter & Gyurovski, 2012).

Self-Fulfilling Prophecies

Another reason first impressions tend to be stable is that we often do things that cause others to confirm our impressions (Madon et al., 2011). If teachers expect particular students to do poorly in mathematics, those students may sense this expectation, exert less effort, and perform below their ability level in that teacher's class, and perhaps in later years (de Boer, Bosker, & van der Werf, 2010; Michael, Garry, & Kirsch, 2012). And if mothers expect their young children to abuse alcohol eventually, those children may be more likely to do so than the children of mothers who didn't convey that expectation (Madon et al., 2006). When, without our awareness, schemas cause us to subtly lead people to behave in line with our expectations, a **self-fulfilling prophecy** is at work.

Self-fulfilling prophecies also help maintain our judgments about groups. If you assume that people in a certain social group are snobby, you might be defensive or even hostile when you encounter them. If they react to your behavior with hostility and anger, their behavior would fulfill your prophecy and strengthen the impression that created it (Kassin, Fein, & Markus, 2014).

Explaining Behavior: Attribution

So far, we have examined how people form impressions about other people's characteristics. But our perceptions of others also include our explanations of their behavior. People tend to form ideas about why people (including themselves) behave as they do and about what behavior to expect in the future (Baumeister & Bushman, 2014; Shafto, Goodman, & Frank, 2012). Psychologists use the term **attribution** to describe the process we go through to explain the causes of behavior (including our own).

Suppose a classmate borrows your lecture notes but fails to return them. You could attribute this behavior to many causes, from an emergency situation to selfishness. Which of these explanations you choose is important, because it will help you *understand* your classmate's behavior, *predict* what will happen if this person asks to borrow something in the future, and decide how to *control* the situation should it arise again. Similarly, whether a person attributes a partner's nagging to temporary stress or to loss of affection can influence whether that person will work on the relationship or end it.

People usually attribute behavior in a particular situation to either internal causes (characteristics of the person) or external causes (characteristics of the situation). For example, if you thought your classmate's failure to return your notes was due mainly to lack of consideration or laziness, you would be making an *internal attribution*. If you thought that the oversight was due mainly to preoccupation with a family crisis, you would be making an *external attribution*. Similarly, if you failed an exam, you could explain it by concluding that you're not very smart (internal attribution) or that your work schedule left you too little time to study (external attribution). The attribution that you make might determine how much you study for the next exam or even whether you decide to stay in school.

Errors in Attribution

Most people are usually logical in their attempts to explain behavior (Aronson, Wilson, & Akert, 2013). However, they are also prone to *attributional errors* that can distort their view of behavior (Baumeister & Bushman, 2014).

self-fulfilling prophecy A process in which an initial impression causes us to bring out behavior in another that confirms the impression.

attribution The process of explaining the causes of people's behavior, including our own.



Why Are They Helping?

Attributional biases are more common in some cultures than in others. In one study, students in an individualist culture were more likely than those in a collectivist culture to explain acts of helping as being due to internal causes such as kindness or the enjoyment of helping (Miller & Bersoff, 1994).

Zute Lightfoot/Alamy

The Fundamental Attribution Error

North American psychologists have paid special attention to the **fundamental attribution error**, a tendency to over-attribute the behavior of others to internal factors (Kassin, Fein, & Markus, 2014). Imagine that you receive an e-mail that contains lots of errors in spelling and grammar. If you are like most people, you'll probably attribute these errors to an internal cause and infer that the writer isn't very smart, or at least not very careful (Vignovic & Thompson, 2010). In doing so, however, you might be ignoring possible external factors, such as the possibility that the writer didn't have time to proofread the message or is not a native English speaker.

The *ultimate attribution error* is a related attributional bias. Here, we attribute the positive actions of people from a different ethnic or social group to external causes, such as easy opportunities, whereas we attribute their negative actions to internal causes, such as dishonesty (Pettigrew, 2001). The ultimate attribution error also causes people to see good deeds done by those in their own group as due to kindness or other internal factors and bad deeds as stemming from external causes, such as unemployment or a bad economy. In this way, the ultimate attribution error helps create and maintain people's negative views of other groups and positive views of their own group (Pettigrew, 2001).

These attributional biases may not be universal (Li et al., 2012). For example, research suggests that the fundamental attribution error and the ultimate attribution error are less likely to appear among people in collectivist cultures such as India, China, Japan, and Korea than among people in the individualist cultures of North America and Europe (Heine, 2010). And even within individualist cultures, some people hold a stronger individualist orientation than others. So some people in these cultures are more likely than others to make attribution errors (Li et al., 2012; Miller, 2001).

Other Attributional Errors

People are less likely to make internal attributions when explaining their own behavior. In fact, people tend to show the **actor-observer effect**: that is, we often attribute other people's behavior to internal causes but attribute our own behavior to external factors, especially when our behavior is inappropriate or inadequate (Baumeister & Bushman, 2014). For example, when Australian students were asked why they sometimes drive too fast, they focused on circumstances, such as being late, but saw other people's dangerous driving as a sign of aggressiveness or immaturity (Harré, Brandt, & Houkamau, 2004). Similarly, when you're driving too slowly, the reason is that you are looking for an address, not that you are a big loser like that jerk who crawled along in front of you yesterday.

The actor-observer effect occurs mainly because people have different kinds of information about their own behavior and the behavior of others. When *you* are in a situation—giving a speech, perhaps—the information most available to you is likely to be external and situational, such as the temperature of the room and the size of the audience. You also have a lot of information about other external factors, such as the amount of time you had to prepare your talk or the upsetting conversation you had this morning. If your speech is disorganized and boring, you can easily attribute it to one or all of these external causes. But when you observe someone else, the most obvious information in the situation is *that person*. You don't know what happened to that person last night or this morning, so you're likely to attribute the quality of the performance to stable, internal characteristics (Moskowitz & Gill, 2013).

fundamental attribution error A bias toward attributing the behavior of others to internal factors.

actor-observer effect The tendency to attribute other people's behavior to internal causes while attributing one's own behavior to external causes.



Attributional Bias

Men whose thinking is colored by the ultimate attribution error might assume that women who succeed at tasks associated with traditional male roles are just lucky and that men succeed at those tasks because of their skill (Deaux & LaFrance, 1998). When this attributional bias is in operation, people who are perceived as belonging to an outgroup, whether on the basis of their sex, age, sexual orientation, religion, ethnicity, or other characteristics, may be denied fair evaluations and equal opportunities.

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Of course, people don't always attribute their own behavior to external forces. In fact, whether they do so often depends on whether the outcome is positive or negative. In one study, when people were asked to explain their good and bad online shopping experiences, they tended to take personal credit for positive outcomes (such as finding bargains) but blamed the computer for problems such as receiving the wrong merchandise (Moon, 2003). In other words, these people showed a **self-serving bias**, the tendency to take personal credit for success but to blame external causes for failure (Alston et al., 2013). This bias has been found in almost all cultures, but as with the fundamental attribution error, it is usually more pronounced among people from individualistic Western cultures than among those from collectivist Eastern cultures (Mezulis et al., 2004).

The self-serving bias occurs, in part, because people are motivated to maintain their self-esteem, and ignoring negative information about themselves is one way to do so. If you just failed an exam, it's painful to admit that the exam was fair. Like the other attributional biases we have discussed, self-serving bias helps people think about their failures and shortcomings in ways that protect their self-esteem (Sanjuán & Magallares, 2013). These self-protective cognitive biases can help us temporarily escape unpleasant thoughts and feelings, but they may also create a distorted view of reality that can lead to other problems. One such problem is *unrealistic optimism*, the tendency to believe that good things (such as financial success or having a gifted child) are likely to happen to you but that bad things (such as accidents or illness) are not (Shepperd et al., 2013). Unrealistic optimism tends to persist even when there is strong evidence against it and can lead to potentially harmful behaviors. For example, people who are unrealistically optimistic about their health may not bother to exercise, may ignore information about how to prevent heart disease, or may underestimate the risks of engaging in unsafe sex (Ferrer et al., 2012). ("In Review: Some Biases in Social Perception" summarizes the common cognitive biases discussed here.)

IN REVIEW

SOME BIASES IN SOCIAL PERCEPTION

Bias	Description
Importance of first impression	Ambiguous information is interpreted in line with a first impression, and the initial schema is recalled better and more vividly than any later correction to it. Actions based on this impression may bring out behavior that confirms it.
Fundamental attribution error	The tendency to over-attribute the behavior of others to internal factors.
Actor-observer bias	The tendency to attribute our own behavior to external causes and to attribute the behavior of others to internal factors.
Self-serving bias	The tendency to attribute one's successes to internal factors and one's failures to external factors.
Unrealistic optimism	The tendency to believe that good things will happen to us but that bad things will not.

In Review Questions

1. The fundamental attribution error appears to be somewhat less likely to occur among people in _____ cultures.
2. First impressions form _____, but tend to change _____.
3. If you believed that immigrants' successes are due to government help but that their failures are due to laziness, you would be committing the _____ error _____.

self-serving bias The tendency to attribute one's successes to internal characteristics while blaming one's failures on external causes.

ATTITUDES

Do attitudes always determine behavior?

Our views about health, safety, or any other topic reflect our attitudes. An **attitude** is our tendency to think, feel, or act in positive or negative ways about the world around us. Social psychologists have long viewed attitudes as having three components (Banaji & Heiphetz, 2010). The *cognitive* component is a set of beliefs about the attitude object. The emotional, or *affective*, component includes feelings about the object. The *behavioral* component is the way people act toward the object.

We can hold attitudes about almost anything, but they are usually focused on other people, such as a spouse, on groups of people (such as the elderly), on social or political issues such as abortion or term limits, or on events and activities such as art exhibitions or sports (Fabrigar & Wegener, 2010). Attitudes help guide how we react to other people, which causes and politicians we support, which products we choose to buy, and countless other daily decisions.

Forming Attitudes

People's attitudes about objects begin to appear in early childhood and continue to emerge throughout life. How do these attitudes form? Genetics may influence some attitudes to an extent (Albaracín & Vargas, 2010), but social learning—what children learn from their parents and others—appears to play the major role in attitude formation. Children learn not only the names of objects but also what they should believe and feel about them and how they should act toward them. For example, a parent may teach a child not only that snakes are reptiles but also that they should be feared and avoided. So as children learn concepts such as “reptile” or “work,” they learn attitudes about those concepts, too (Aronson, Wilson, & Akert, 2013).

Classical and operant conditioning can also shape attitudes (Baron, Byrne, & Branscombe, 2006). Advertisers pair up enjoyable music or sexy images with the products they want to sell (Pratkanis & Aronson, 2001; Walther & Langer, 2008), and parents, teachers, and peers reward children for stating particular views. The *mere-exposure effect* is influential as well. All else being equal, more frequent exposure to an object produces a more positive attitude toward it (deZilva, Mitchell, & Newell, 2013). One study found, for example, that the more often European children and teens saw an ad for a particular brand of cigarettes, the more they liked the brand, even if they didn't smoke (Morgenstern, Isensee, & Hanewinkel, 2012). The mere-exposure effect helps explain why commercials and political ads are aired over and over and why some rock bands won't include new songs in a live concert until their fans have repeatedly heard and come to like the recorded versions.

Changing Attitudes

The nearly \$170 billion a year spent on advertising in the United States alone provides just one example of how people constantly try to change our attitudes. There are many others, including the persuasive messages of groups concerned with abortion or gun control or recycling—and don't forget about friends and family members who want you to think the way they do.

Two Routes to Attitude Change

Whether a persuasive message succeeds in changing attitudes depends mainly on three factors: (1) the person communicating the message; (2) the content of the message; and (3) the person receiving it (Albaracín & Vargas, 2010). The **elaboration likelihood model** of attitude change provides a framework for understanding when and how these

attitude A tendency toward a particular cognitive, emotional, or behavioral reaction to objects in one's environment.

elaboration likelihood model A model of attitude change suggesting that people can change their attitudes through a central route (by considering an argument's content) or through a peripheral route (by relying on irrelevant persuasion cues).

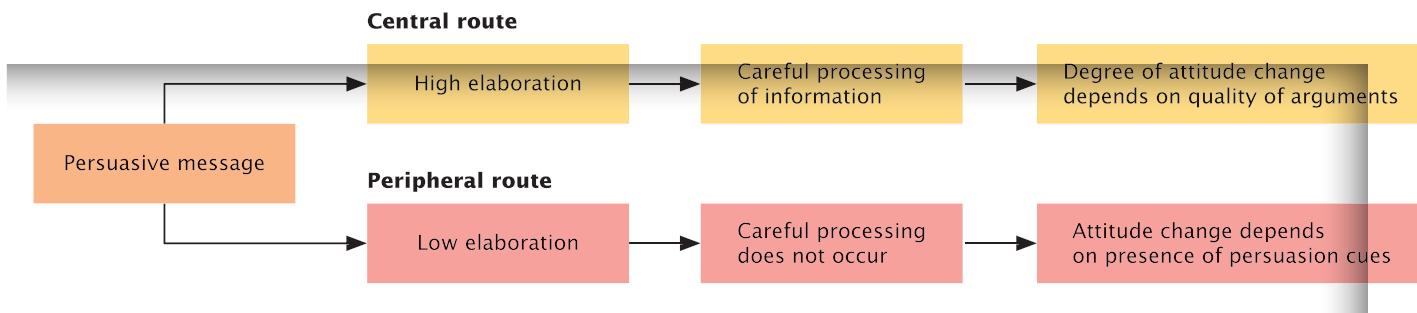


FIGURE 16.2
The Elaboration Likelihood Model of Attitude Change

The central route to attitude change involves carefully processing and evaluating a message's content (high elaboration).

The peripheral route involves little processing and evaluation of message content (low elaboration) and relies instead on persuasion cues such as the attractiveness of the person making the argument (Cacioppo, Petty, & Crites, 1993).

factors affect attitude change (Petty & Briñol, 2012). As shown in Figure 16.2, the model is based on the idea that persuasive messages can change people's attitudes through one of two main routes.

The first is called the *peripheral route* because when it is activated, we devote little attention to the central content of the persuasive message. We tend to be affected instead by peripheral, or surrounding, persuasion cues, such as the confidence, attractiveness, or other characteristics of the person who delivers the message. These persuasion cues influence attitude change even though they may have nothing to do with the logic or accuracy of the message itself. Commercials in which movie stars or other attractive non-experts endorse pain relievers or denture cleaners encourage the peripheral route to attitude change.

By contrast, when the *central route* is activated, the core content of the message becomes more important than the communicator's characteristics in determining attitude change. A person following the central route uses logical steps—such as those outlined in the Thinking Critically sections of this book—to analyze the content of the persuasive message, including the validity of its claims, whether it leaves out important information, alternative interpretations of evidence, and so on.

What determines which route people will follow? One factor is a person's *need for cognition*, the desire to think things through (Douglas, Sutton, & Stathi, 2010). People with a strong need for cognition are more likely than others to follow a central route to attitude change. Personal involvement with a message's content is another important factor. People are more likely to activate the central route when thinking about topics that are personally relevant (Petty & Briñol, 2012). Suppose, for example, that you hear someone arguing for the cancellation of all student loans in Chile. This message might persuade you through the peripheral route if it comes from someone who looks attractive and sounds intelligent. However, if the message proposes eliminating student loans at your own school, you're more likely to follow the central route. You might still be persuaded, but only if the logic of the message is clear and convincing. This is why celebrity endorsements tend to be more effective when the products being advertised are relatively unimportant to the audience.

Persuasive messages are not the only means of changing attitudes. Another approach is to get people to act in ways that are inconsistent with their attitudes in the hope that they will adjust those attitudes to match their behavior. Often, such adjustments do occur, and Leon Festinger proposed a theory to explain why.

Cognitive Dissonance Theory

According to his **cognitive dissonance theory**, people want their thoughts, beliefs, and attitudes to be in harmony with one another and with their behavior (Festinger, 1957). People

cognitive dissonance theory A theory that attitude change is driven by efforts to reduce tension caused by inconsistencies between attitudes and behaviors.

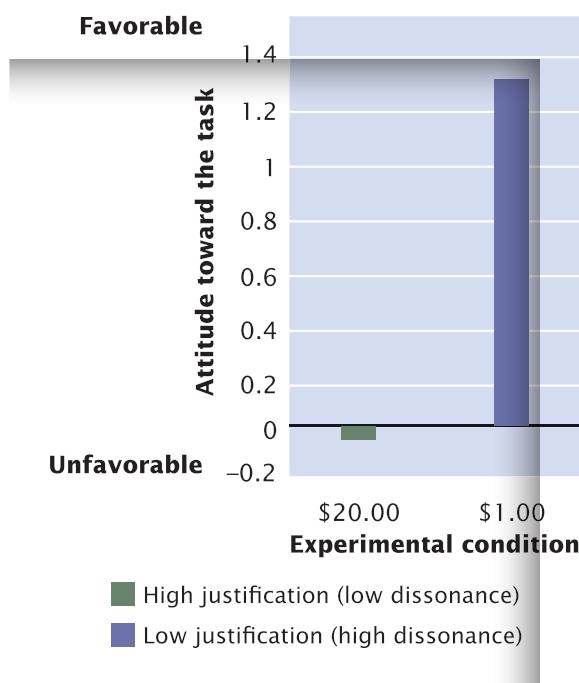


FIGURE 16.3
Cognitive Dissonance and Attitude Change

According to cognitive dissonance theory, the \$20 that people were given to say that a boring task was enjoyable provided them with a clear justification for lying. Having been paid to lie, they should experience little dissonance between what they said and what they felt about the task. And in fact their attitude toward the task was not positive. However, people who received only \$1 had little justification to lie so they reduced their dissonance mainly by displaying a more positive attitude toward the task.

experiencing inconsistency, or *dissonance*, among these elements, become anxious and are motivated to make them more consistent (Harmon-Jones, 2010; Gawronski, 2012). For example, someone who believes that “smoking is dangerous” but who must also admit that “I smoke” would be motivated to reduce the resulting dissonance. Because it is often difficult to change well-established behavior, people usually reduce cognitive dissonance by changing attitudes that are inconsistent with the behavior. So rather than quit smoking, the smoker might decide that smoking is not so dangerous after all.

In one of the first studies of cognitive dissonance, Festinger and his colleague Merrill Carlsmith asked people to turn pegs in a pegboard, a very dull task (Festinger & Carlsmith, 1959). Later, some of these people were asked to persuade a person who was waiting to participate in the study that the task was “exciting and fun.” Some were told that they would be paid \$1 to tell this lie. Others were promised \$20. After they had talked to the waiting person, their attitudes toward the dull task were measured. Figure 16.3 shows and explains the surprising results. The people who were paid just \$1 to lie liked the dull task more than those who were paid \$20 (Festinger & Carlsmith, 1959).

Hundreds of other experiments have also found that when people publicly engage in behaviors that are inconsistent with their privately held attitudes, they’re likely to change their attitudes to be consistent with their behavior (Cooper, Mirabile, & Scher, 2005). Attitude-behav-

ior inconsistency is likely to change attitudes when (1) the inconsistency causes some distress or discomfort in a person; and (2) changing attitudes will reduce that discomfort. But why should attitude-behavior inconsistency cause discomfort in the first place? There is considerable debate among attitude researchers about this question (Harmon-Jones, Amodio, & Harmon-Jones, 2009). Currently, the most popular of several possible answers is that discomfort results when people’s positive self-concept (e.g., “I am honest”) is threatened by recognizing that they have done something inconsistent with that self-concept. For example, if they have encouraged another person to do something that they themselves didn’t believe in or that they themselves wouldn’t do, this inconsistency makes most people feel uncomfortable. So they change their attitudes to reduce or eliminate the discomfort (Stone & Fernandez, 2008). In other words, if people can persuade themselves that they really believe in what they’ve said or done, the inconsistency disappears, their positive self-concept is restored, and they can feel good about themselves again. One study suggests that people can experience the same result, at least for a little while, just by washing their hands (Lee & Schwarz, 2010). Perhaps this cleansing represents a fresh start and creates a greater sense of moral superiority (Zhong, Strejcek, & Sivanathan, 2010).

The circumstances that lead to cognitive dissonance may be different in the individualist cultures of Europe and North America than in collectivist cultures such as those in Japan and China. In individualist cultures, dissonance typically arises from behaving in a manner inconsistent with one’s own beliefs because this behavior causes self-doubt. But in collectivist cultures, dissonance typically arises when such behavior causes people to worry about what others think of them (Imada & Kitayama et al., 2010). Cultural values also help shape dissonance-reducing strategies. For example, people from individualistic cultures can reduce the unpleasant feelings that accompany dissonance by affirming their value as unique individuals, whereas people from collectivist cultures can reduce the same kind of feelings by affirming the value of the groups to which they belong (Hoshino-Browne et al., 2005). (“In Review: Forming and Changing Attitudes” summarizes some of the main processes through which attitudes are formed and changed.)

FORMING AND CHANGING ATTITUDES

Type of Influence	Description
Social learning and conditioning	Attitudes are usually formed through observing how others behave and speak about an attitude object, as well as through classical and operant conditioning.
Elaboration likelihood model	People change attitudes through either a central or peripheral route, depending on factors such as personal involvement.
Cognitive dissonance	Holding inconsistent cognitions can motivate attitude change.

In Review Questions

- According to the elaboration likelihood model, people are more likely to pay close attention to the content and logic of a persuasive message if the _____ route to attitude change has been activated.
- Holding attitudes that are similar to those of your friends illustrates the importance of _____ in attitude formation.
- According to cognitive dissonance theory, we tend to reduce conflict between attitudes and behaviors by changing our _____.

PREJUDICE AND STEREOTYPES

How does prejudice develop?

All of the principles behind impression formation, attribution, and attitudes come together in prejudice and stereotypes. **Stereotypes** are the perceptions, beliefs, and expectations a person has about members of a particular group. They are schemas about entire groups of people (Dovidio & Gaertner, 2010). Usually, they involve the false assumption that all members of a group share the same characteristics. The characteristics that make up the stereotype can be positive, but more often they are negative. The most prevalent and powerful stereotypes focus on observable personal attributes, particularly ethnicity, gender, and age (Bodenhausen & Richeson, 2010).

The stereotypes people hold can be so ingrained that their effects on behavior can be automatic and unconscious (Dovidio et al., 2009; Stepanikova, Triplett, & Simpson, 2011). In one study, for example, European American and African American participants played a video game in which white or black men suddenly appeared on a screen holding an object that might be a weapon (Correll et al., 2002; see Figure 16.4). The participants had to immediately “shoot” armed men but not unarmed ones. Under this time pressure, participants’ errors were not random. If they “shot” an unarmed man, he was more likely to be black; when they failed to “shoot” an armed man, he was more likely to be white. These differences appeared in both European American and African American participants, but were most pronounced among those who held the strongest cultural stereotypes about blacks.

Stereotyping often leads to **prejudice**, which is a positive or negative attitude toward an individual based simply on that individual’s membership in some group (Biernat & Danaher, 2013). The word *prejudice* means “prejudgment.” Many theorists believe that prejudice, like other attitudes, has cognitive, affective, and behavioral components. The cognitive component of prejudice is stereotyped thinking. The affective component includes people’s hatred, admiration, anger, and other feelings about stereotyped groups. The behavioral component of prejudice involves **social discrimination**, which is differing treatment of individuals who belong to different groups. Prejudiced thinking can be quite complex. For instance, most people are prejudiced in favor of attractive people in general, but in a competitive situation they tend to be prejudiced against the best-looking individuals of the same sex (Agthe, Spörrle, & Maner, 2010, 2011).

stereotypes False assumptions that all members of some group share the same characteristics.

prejudice A positive or negative attitude toward people in certain groups.

social discrimination Differential treatment of people in certain groups; the behavioral component of prejudice.

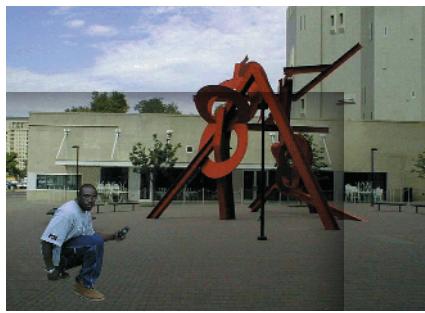


FIGURE 16.4
The Impact of Stereotypes
on Behavior

TRY THIS When these men suddenly appeared on a video screen, participants were supposed to “shoot” them, but only if they appeared to be armed (Correll et al., 2002). Stereotypes about whether white men or black men are more likely to be armed significantly affected the errors made by participants in firing their video game “weapons.” Similar results appeared in a sample of police officers, although they were not as quick as civilians were to “shoot” an unarmed black man (Correll et al., 2007). Cover these photos with a pair of index cards, then ask a few friends to watch as you show each photo, one at a time, for just an instant, before covering it again. Then ask your friends to say whether either man appeared to be armed. Was one individual more often seen as armed? If so, which one?

University of Chicago

Theories of Prejudice and Stereotyping

Prejudice and stereotyping may occur for several reasons. Let’s consider three explanatory theories, each of which has been supported by research and accounts for many instances of stereotyping and prejudice.

Motivational Theories

Prejudice meets certain needs and increases the sense of security for some people. This idea was first proposed by Theodor W. Adorno and his associates more than sixty years ago (Adorno et al., 1950), and it is still seen as a major cause of prejudice (Goodnight et al., 2013; Hehman et al., 2012; Huang et al., 2011). Researchers suggest that prejudice is especially likely among people who display a personality trait called *authoritarianism*. Authoritarianism is composed of three main elements: (1) acceptance of conventional or traditional values; (2) willingness to unquestioningly follow the orders of authority figures; and (3) an inclination to act aggressively toward individuals or groups identified by authority figures as threats to the person’s values or well-being. In fact, people with an authoritarian orientation tend to view the world as a threatening place (Sibley & Duckitt, 2013). One way to protect themselves from the threats they perceive all around them is to strongly identify with people like themselves—their *ingroup*—and to reject, dislike, and maybe even punish people who are members of *outgroups*, groups that are different from their own (Thomsen, Green, & Sidanius, 2008). Looking down on and discriminating against members of these outgroups—gay men and lesbians, African Americans, or Muslims, for example—may help authoritarian people feel safer and better about themselves (MacInnis et al., 2013; Onraet & Van Heil, 2014).

Another motivational explanation of prejudice involves the concept of social identity, discussed earlier. Recall that whether or not they display authoritarianism, most people are motivated to identify with their ingroup and tend to see it as better than other groups (Abrams & Hogg, 2010). As a result, members of an ingroup often see all members of out-groups as less attractive and less socially acceptable than members of the ingroup and may thus treat them badly (Brewer, 2010). In other words, prejudice may result when people’s motivation to enhance their own self-esteem causes them to disrespect other people.

Cognitive Theories

Stereotyping and prejudice may also result from the thought processes that people use in dealing with the world. There are so many other people, so many situations in which we meet them, and so many behaviors that others might display that we cannot possibly attend to and remember them all. Therefore, when people encounter other people, especially for the first time, they must use schemas and other cognitive shortcuts to organize and make sense of their social world (Penner & Dovidio, 2014). Often these cognitive processes provide accurate and useful summaries of what to expect from other people, but sometimes they lead to inaccurate stereotypes (Lewis et al., 2012).

For example, one effective way to deal with social complexity is grouping people into *social categories*. Rather than remembering every detail about everyone we have ever encountered, we tend to put other people into categories such as doctor, senior citizen, Republican, student, Italian, and the like (Biernat & Danaher, 2013). To further simplify perception of these categories, we tend to see group members as quite similar to one another. In fact, members of one ethnic group may find it harder to distinguish among specific faces in other ethnic groups than in their own (Anthony, Cooper, & Mullen, 1992; Michel et al., 2006). People also tend to assume that all members of a different group hold the same beliefs and values and that those beliefs and values differ from those of their own group (Gaertner, Dovidio, & Houlette, 2010; Waytz & Young, 2012). And because particularly noticeable stimuli tend to draw a lot of attention, rude behavior by even a few members of an easily identified ethnic group may lead people to see an *illusory correlation* between rudeness and ethnicity (Meiser & Hewstone, 2010). As a result, they may incorrectly believe that all members of that group are rude. Finally, many people—especially those at lower levels of cognitive ability—seem to have a need for *cognitive closure*, meaning



Schemas and Stereotypes

The use of schemas to assign certain people to certain categories can be helpful when deciding who is a customer and who is a store employee, but it can also lead to inaccurate stereotypes. After 9/11, many people began to think of all Muslims as potential terrorists and to discriminate against them.

Jessica Rinaldi/Reuters/Landov

that they prefer to decide quickly and once and for all what they think about everyone in a particular group (Hodson & Busseri, 2012; Roets & Hiel, 2011). Satisfying this need saves them the time and effort it would take to consider individuals as individuals (Rubin, Paolini, & Crisp, 2010).

Learning Theories

Like other attitudes, prejudice can be learned. Some prejudice is learned as a result of personal conflicts with members of particular groups, but people also develop negative attitudes toward groups with whom they have had little or no contact. Learning theories suggest that children can pick up prejudices just by watching and listening to parents, peers, and others (Castelli, Zogmaister, & Tomelleri, 2009; Rutland, Killen, & Abrams, 2010). Evolutionary forces may even have created a kind of biopreparedness (described in

the learning chapter) that makes us especially likely to affiliate with our own group and to learn to fear people who are strangers or who look different from us (Kelly et al., 2007; Lewis & Bates, 2010; Park, 2012). The media also portray certain groups in ways that teach stereotypes and prejudice (Kassin, Fein, & Markus, 2014). For example, one study found that European American characters in popular television shows tend to behave more negatively toward African American characters than toward other European Americans. This study also found that watching these shows can elevate viewers' prejudice against African Americans in general (Weisbuch, Pauker, & Ambady, 2009). No wonder so many young children already know about the supposed negative characteristics of certain groups long before they ever meet members of those groups (Baron & Banaji, 2006; Degner & Wentura, 2010).

Reducing Prejudice

The cognitive and learning theories of prejudice and stereotyping suggest that members of one group are often ignorant of, or misinformed about, the characteristics of people in other groups (Dovidio, Gaertner, & Kawakami, 2010). However, simply providing accurate information to prejudiced people and encouraging them to be less prejudiced can actually increase prejudice (Legault, Gutsell, & Inzlicht, 2011). Encouraging people to ignore ethnic differences does not seem to reduce prejudiced attitudes, either (Apfelbaum et al., 2010).

The **contact hypothesis** provides a more promising approach. It states that stereotypes and prejudice toward a group will decrease as contact with that group increases (Hodson & Hewstone, 2013). Before 1954, most black and white schoolchildren in the United States knew very little about one another because they went to separate schools. Then the Supreme Court declared that segregated public schools should be prohibited. In doing so, the court created a real-life test of the contact hypothesis.

Did the desegregation of U.S. schools confirm that hypothesis? In a few schools, integration was followed by a decrease in prejudice, but in many places, either no change occurred or prejudice actually increased (Pettigrew et al., 2011). However, these results did not necessarily disprove the contact hypothesis. In-depth studies of schools with successful desegregation suggested that contact alone was not enough. Integration usually reduced prejudice only when certain social conditions were created (Pettigrew et al., 2011). First, members of the two groups had to be of roughly equal social and economic status. Second, school authorities had to promote cooperation and interdependence between ethnic groups by having members of the two groups work together on projects that required reliance on one another to achieve success. Third, the contact between group members had to occur on a one-to-one basis. It was only when *individuals* got to know each other that the errors contained in stereotypes became apparent. Finally, the members of each group had to be seen as typical and not unusual in any significant way. When these four conditions were met, the children's attitudes toward one another became more positive (Deeb et al., 2011).

A teaching strategy called the *jigsaw technique* helps create these conditions (Aronson & Patnoe, 2011). The strategy calls for children from several ethnic groups to work in teams to complete a task, such as writing a report about a famous person in history. Each child learns a separate piece of information about this person, such as place of birth or greatest

contact hypothesis The idea that stereotypes and prejudice toward a group will diminish as contact with the group increases.



Fighting Ethnic Prejudice

Negative attitudes about members of ethnic groups are often based on negative personal experiences or on the negative experiences and attitudes people hear about from others. Cooperative contact between equals can help promote mutual respect and reduce ethnic prejudice (Fischer, 2011; Hodson, 2011; Vezzali & Giavannini, 2011).

Robert Brenner/PhotoEdit

LINKAGES Can we ever be unbiased about anyone? (a link to Consciousness)

LINKAGES Can subliminal stimuli influence our judgments about people? (a link to Perception)

achievement, then provides this information to the team (Aronson, 2004). Studies show that children from various ethnic groups who take part in the jigsaw technique and other cooperative learning experiences display substantial reductions in prejudice while also facilitating learning (Aronson & Patnoe, 2011; Doymus, Karacop, & Simsel, 2010). The success reported in these studies has greatly increased the popularity of cooperative learning exercises in U.S. classrooms. Such exercises may not eliminate all aspects of ethnic prejudice in children, but they seem to be a step in the right direction.

Can friendly, cooperative, interdependent contact reduce the more entrenched forms of prejudice seen in adults? It may (Hodson, 2011). One study found that the prejudicial attitudes of first-year college students weakened more if their roommate was from a different ethnic group rather than from the students' own ethnic group (Shook & Fazio, 2008). Another showed that when equal-status adults from different ethnic groups work jointly toward a common goal, bias and distrust can be reduced, particularly among those in ethnic majority groups (Pettigrew et al., 2011). This is especially true if they come to see themselves as members of the same group rather than as belonging to opposing groups (al Ramiah & Hewstone, 2013). The challenge to be met in creating such cooperative experiences in the real world is that the participants must be of equal status, a challenge made more difficult in many countries by the status differences that still exist between ethnic groups (Kenworthy et al., 2006).

In the final analysis, contact can provide only part of the solution to the problems of stereotyping, prejudice, and social discrimination. To reduce ethnic prejudice, we must develop additional techniques to address the social cognitions and perceptions that lie at the core of bigotry and hatred toward people who are different from ourselves (Amodio & Devine, 2009; Bigler & Liben, 2007).

THINKING CRITICALLY

IS ETHNIC PREJUDICE TOO INGRAINED EVER TO BE ELIMINATED?

Overt ethnic prejudice has decreased dramatically in the United States over the past fifty to sixty years. Four decades ago, fewer than 40 percent of European Americans said they would vote for an African American presidential candidate (Dovidio & Gaertner, 1998); in 2008, an African American president was elected. Despite these changes, research in social psychology suggests that more subtle aspects of prejudice and discrimination may remain as entrenched in the United States today as they were a couple of decades ago (Bonilla-Silva & Dietrich, 2011).

What am I being asked to believe or accept?

Some psychologists claim that even people who see themselves as unprejudiced and who disavow ethnic stereotypes and discrimination may, without realizing it, hold negative stereotypes about ethnic outgroups and, in certain situations, display prejudice and discriminatory behavior (Dovidio et al., 2009; Penner & Dovidio, 2014; Sabin et al., 2009).

What evidence is available to support the assertion?

Evidence for this assertion focuses primarily on prejudice against dark-skinned people by light-skinned people. It comes, first, from studies testing the theory of *aversive racism* (Hodson, Dovidio, & Gaertner, 2010). This theory holds that even though many people of European descent consider ethnic prejudice unacceptable or aversive, they still sometimes display it—especially when they can do so without admitting, even to themselves, that they are prejudiced (Gaertner & Dovidio, 1986; Kunstman & Plant, 2008).

In one test of this theory (Hodson, Dovidio, & Gaertner, 2010), white participants read a story about a robbery. There were no eyewitnesses, but police had arrested a known troublemaker whose DNA linked him to the crime. For half participants, the story described the suspect as white; the other half read that he was black. If they were allowed to consider the DNA evidence, both groups were equally likely to say the suspect was guilty, suggesting that

(continued)

racial prejudice was not operating. However, some participants had been told that the DNA evidence was inadmissible in court, so they had to ignore it. These participants were more likely to judge black rather than white suspects guilty and to recommend harsher punishments for the black criminals.

A second line of evidence for the entrenched nature of prejudice comes from research showing that many people hold negative stereotypes about ethnic minorities but are unaware that they do so. This kind of prejudice is often called *implicit* (Biernat & Danaher, 2013; Penner & Dovidio, in press). In contrast, people with *explicit* prejudice are aware of their negative attitudes toward particular groups, and so can choose to control their bias (Dovidio & LaFrance, 2013; Penner et al., 2013). An example of implicit bias appeared in a study of physicians who were not conscious of their bias against African Americans, yet were found to behave more negatively toward their African American patients (Penner et al., 2013). The doctors' behavior caused these patients, in turn, to react negatively toward the doctors (Blair et al., 2013).

Other researchers have used the priming procedures described in the chapter on consciousness to activate unconscious thoughts and feelings that can alter people's reactions to stimuli without their awareness (Lybarger & Monteith, 2011). In one study, white participants were exposed to subliminal presentations of pictures of black individuals (Chen & Bargh, 1997). The participants were not consciously aware that they had seen these pictures, but when they interacted with a black man soon afterward, those who had been primed with the pictures acted more negatively toward him and saw him as more hostile than people who had not been primed. Other studies suggest it is also possible to prime unconscious negative stereotypes about other groups, including women and people who are overweight (Glick & Fiske, 2001; Degner & Wentura, 2009). All of these findings suggest that stereotypes may be so well learned and so ingrained in people that they may be activated automatically and without conscious awareness (Amadio & Devine, 2009).

Are there alternative ways of interpreting the evidence?

The evidence presented so far suggests that it may be impossible to eliminate ethnic prejudice because everyone harbors implicit negative bias about various groups. But the evidence does not necessarily mean that such biases will affect everyone in the same way. For example, it could be that they have a greater impact on people who are more overtly prejudiced and less concerned about displaying that prejudice.

What additional evidence would help evaluate the alternatives?

One way to evaluate this possibility is to compare the responses of prejudiced and unprejudiced people in various experimental situations. In one mock-trial study, for example, overtly prejudiced white jurors recommended the death penalty more often for black defendants than for white defendants found guilty of the same crime. Low-prejudice white jurors showed this bias only when they believed that a black member of the jury also favored giving the death penalty (Dovidio et al., 1997). Priming studies, too, show that although negative stereotypes can be primed in both prejudiced and unprejudiced people, it is easier to do in people who openly display their ethnic bias (Amadio & Devine, 2010). Furthermore, activation of these stereotypes may be less likely to affect the conscious attitudes and behavior of unprejudiced people. So when unconscious stereotypes are activated in unprejudiced people, the effects tend to appear in subtle ways, such as in facial expressions or other nonverbal behaviors (e.g., Vanman et al., 2004).

What conclusions are most reasonable?

Taken together, research evidence presents a mixed picture regarding the possibility of eliminating ethnic prejudice. True, ethnic prejudice may be so ingrained in some people that they may hold nonconscious or implicit bias and stereotypes, but it may still be possible to eliminate even nonconscious stereotypes (e.g., Devine et al., 2012; Gervais & Norenzayan, 2012; Luguri, Napier, & Dovidio, 2012). It also appears that when apparently unprejudiced people are made aware of their negative beliefs about some target group, they will actively work to prevent those beliefs from influencing their behavior toward members of that group (Woodcock & Monteith, 2013).



Proximity and Liking

TRY THIS Research on environmental factors in attraction suggests that, barring bad first impressions, the more often we make contact with someone—as neighbors, classmates, or co-workers, for example—the more we tend to like that person (Preciado et al., 2012). Does this principle apply in your life? To find out, think about how and where you met each of your closest friends. If you can think of cases in which proximity did not lead to liking, what do you think interfered with the formation of friendship?

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TRY THIS Similarity can take many forms. How many apps do you and your closest friends have in common?

S. Harris/ScienceCartoonsPlus.com

INTERPERSONAL ATTRACTION

What factors affect who likes whom?

Research on prejudice suggests some of the reasons why people may come to dislike or even hate other people. An equally fascinating aspect of social cognition is why people like or love other people. Folklore tells us that “opposites attract” but also that “birds of a feather flock together.” Each statement is partly true, but neither is entirely accurate in all cases. We begin our coverage of interpersonal attraction by discussing the factors that draw people toward one another. We then examine how liking sometimes develops into more intimate relationships.

Keys to Attraction

Whether you like someone or not depends partly on situational factors and partly on personal characteristics.

The Environment

One of the most important determinants of attraction is simple physical proximity (Clark & Lemay, 2010). As long as you do not initially dislike a person, your liking for that person will increase with additional contact (Kassin, Fein, & Markus, 2014). This proximity phenomenon—another example of the *mere-exposure effect* mentioned earlier—helps account for why next-door neighbors are usually more likely to become friends than people who live farther from one another. Chances are, most of your friends are people you met as neighbors, co-workers, or classmates (Reis et al., 2011).

The circumstances under which people first meet also influence attraction. You are much more likely to be attracted to a stranger if you meet in comfortable, rather than uncomfortable, physical conditions (IJzerman & Semin, 2009). Similarly, if you receive a reward in the presence of a stranger, the chances are greater that you will like that stranger, even if the stranger is not the one giving the reward (Clark & Pataki, 1995). At least among strangers, then, liking can occur through associating someone with something pleasant. But, there are limits. One study found that pairing positive stimuli with pictures of someone of the opposite sex did not increase attraction to that person if it was known that the person was already involved in a romantic relationship (Korayni, Gast, & Rothermund, 2013).

Similarity

People also tend to like those they perceive as similar to themselves on variables such as appearance, age, religion, smoking or drinking habits, being a “morning” or “evening” person, or their use of language (Clark & Lemay, 2010; Ireland et al., 2011; MacKinnon, Jordan, & Wilson, 2011). Similarity in attitudes is another important influence on attraction (Baumeister & Bushman, 2014).

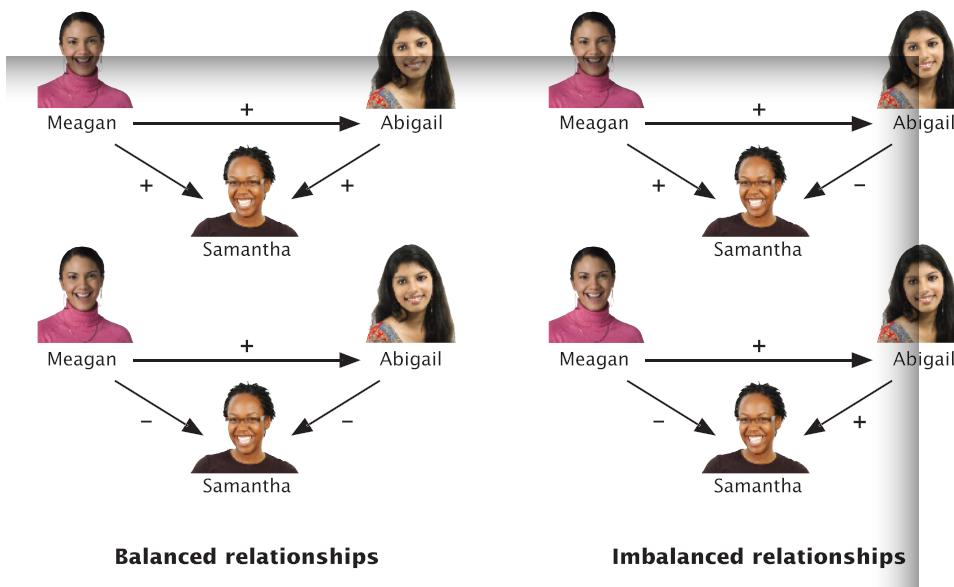
An especially good predictor of liking is similarity in attitudes about mutual acquaintances, because in general, people prefer relationships that are *balanced*. As illustrated in Figure 16.5, if Meagan likes Abigail, the relationship is balanced as long as they agree on their evaluation of a third person, regardless of whether they like or dislike that third person. However, the relationship will be imbalanced if Meagan and Abigail disagree on their evaluation of a third person.

One reason why we like people whose attitudes are similar to our own is that we expect such people to think highly of us (Condon & Crano, 1988). It's hard to

FIGURE 16.5
Balanced and Imbalanced Relationships

Here are some common examples of balanced and imbalanced relationships among three people. The plus and minus signs refer to liking and disliking, respectively. Balanced relationships are comfortable and harmonious; imbalanced ones often bring conflict.

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say, though, whether attraction is a cause or an effect of similarity. For example, you might like someone because his attitudes are similar to yours, but it is also possible that as a result of liking him, your attitudes will become more similar to his (Davis & Rusbult, 2001). Even if your own attitudes do not change, you may change your perceptions of the liked person's attitudes such that those attitudes now seem more similar to yours (Aronson, Wilson & Akert, 2013).

Physical Attractiveness

Physical characteristics are another important factor in attraction, particularly in the early stages of a relationship (Leary, 2010; Platek & Singh, 2010). From preschool through adulthood, physical attractiveness is a key to popularity with members of both sexes (Finkel & Baumeister, 2010). Consistent with the **matching hypothesis** of interpersonal attraction, however, people tend to date, marry, or form other committed relationships with those who are similar to themselves in physical attractiveness (Finkel & Baumeister, 2010). One possible reason for this is that although people tend to be most attracted to those with the greatest physical appeal, they also want to avoid being rejected by such individuals. So it may be compromise and not preference that leads people to pair off with those who are roughly equivalent to themselves in physical attractiveness (Kavanagh, Robins, & Ellis, 2010).

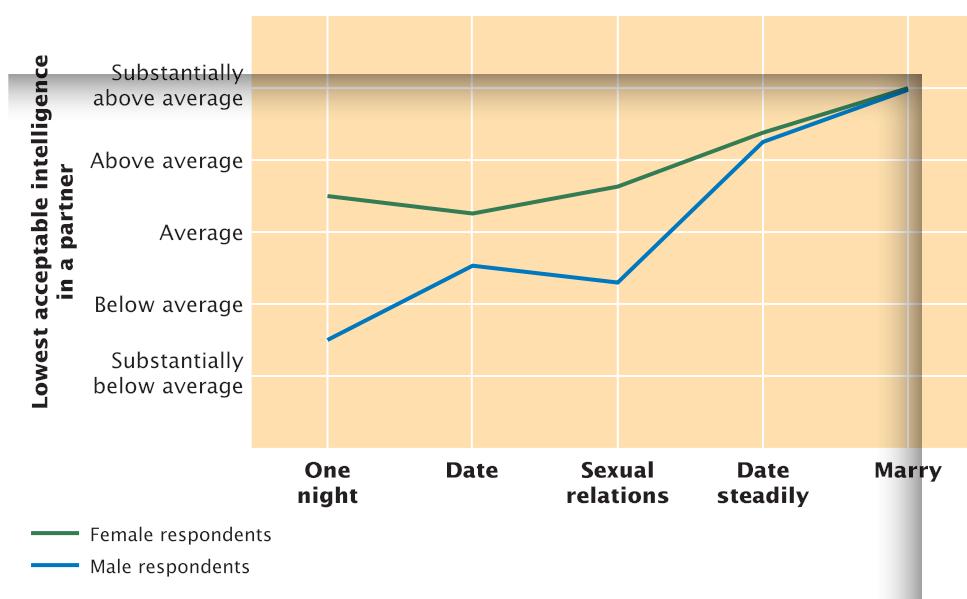
Intimate Relationships and Love

There is much about intimate relationships that psychologists do not and may never understand, but they are learning all the time (Clark & Grote, 2013). For example, evolutionary psychologists suggest that men and women employ different strategies to ensure the survival of their genes and that each gender looks for different attributes in a potential mate (Buss, 2013; Foster, 2013). The physical appearance of a partner tends to be more important to men than to women, whereas a partner's intelligence tends to be more important to women than to men (Buss, 2008; see Figure 16.6). Women also tend to be more influenced than men are by a potential mate's economic and social status. In one study, for instance, women rated men as being far more attractive when the men were seen to own a luxury automobile rather than an ordinary one. Men's ratings of women's attractiveness was not related to the kind of car she owned (Dunn & Searle, 2010).

matching hypothesis The notion that people are most likely to form committed relationships with those who are similar to themselves in physical attractiveness.

FIGURE 16.6
Sex Differences in Date and Mate Preferences

Evolutionary psychologists suggest that men and women have developed different strategies for selecting sexual partners (e.g., Buss, 2004b; Kenrick, Neuberg, & Cialdini, 2005). These psychologists say that women became more selective than men because they can have relatively few children and want a partner who is best able to help support those children. So when asked about the intelligence of people they would choose for one-night stands, dating, and sexual relationships, women preferred much smarter partners than men did. Only when the choices concerned steady dating and marriage did the men's preference for bright partners equal that of the women (Eastwick & Finkel, 2008). Critics suggest, however, that these sex differences reflect learned social norms and expected gender-specific behaviors (Eagly & Wood, 1999; Miller, Putcha-Bhagavatula, & Pedersen, 2002).



Intimate Relationships

Eventually, people who are attracted to each other usually become *interdependent*, which means that one person's thoughts, emotions, and behaviors affect the thoughts, emotions, and behaviors of the other (Clark & Lemay, 2010). Interdependence is one of the defining characteristics of intimate relationships (Clark & Grote, 2013).

Another key component of successful intimate relationships is *commitment*, which is the extent to which each person is psychologically attached to the relationship and wants to remain in it (Amodio & Showers, 2005). People feel committed to a relationship when they are satisfied with the rewards they receive from it, when they have invested significant tangible and intangible resources in it, and when they have few attractive alternative relationships available to them (Bui, Peplau, & Hill, 1996; Lydon, Fitzsimons, & Naidoo, 2003).

Analyzing Love

Although some people think love is simply a strong form of liking, research suggests that romantic love and liking are quite separate emotions, at least in the sense that they are associated with differing patterns of brain chemistry and brain activity (Hsia & Schweinle, 2012). And although romantic love and sexual desire are often experienced together, they too seem to be separate emotions associated with different patterns of physiological arousal (Acevedo & Aron, 2014). Further, most theorists agree that there are several different types of love (Berscheid, 2010). One widely accepted view distinguishes between passionate (romantic) love and companionate love (Berscheid, 2011). *Passionate love* is intense, arousing, and marked by both strong physical attraction and deep emotional attachment. Sexual feelings are intense, and thoughts of the other intrude on each person's awareness frequently. *Companionate love* is less arousing but psychologically more intimate. It is marked by mutual concern for the welfare of the other and a willingness to disclose personal information and feelings (Berscheid, 2010). People who experience companionate love seem especially satisfied with their lives (Kassin, Fein, & Markus, 2014).

Robert Sternberg (2009) has offered an even broader analysis of love. According to his *triangular theory*, the three basic components of love are passion, intimacy, and commitment (see Figure 16.7). Various combinations of these components result in various types of love. For example, Sternberg suggests that *romantic love* involves a high degree of passion and intimacy yet lacks substantial commitment to the other person. *Companionate love* is

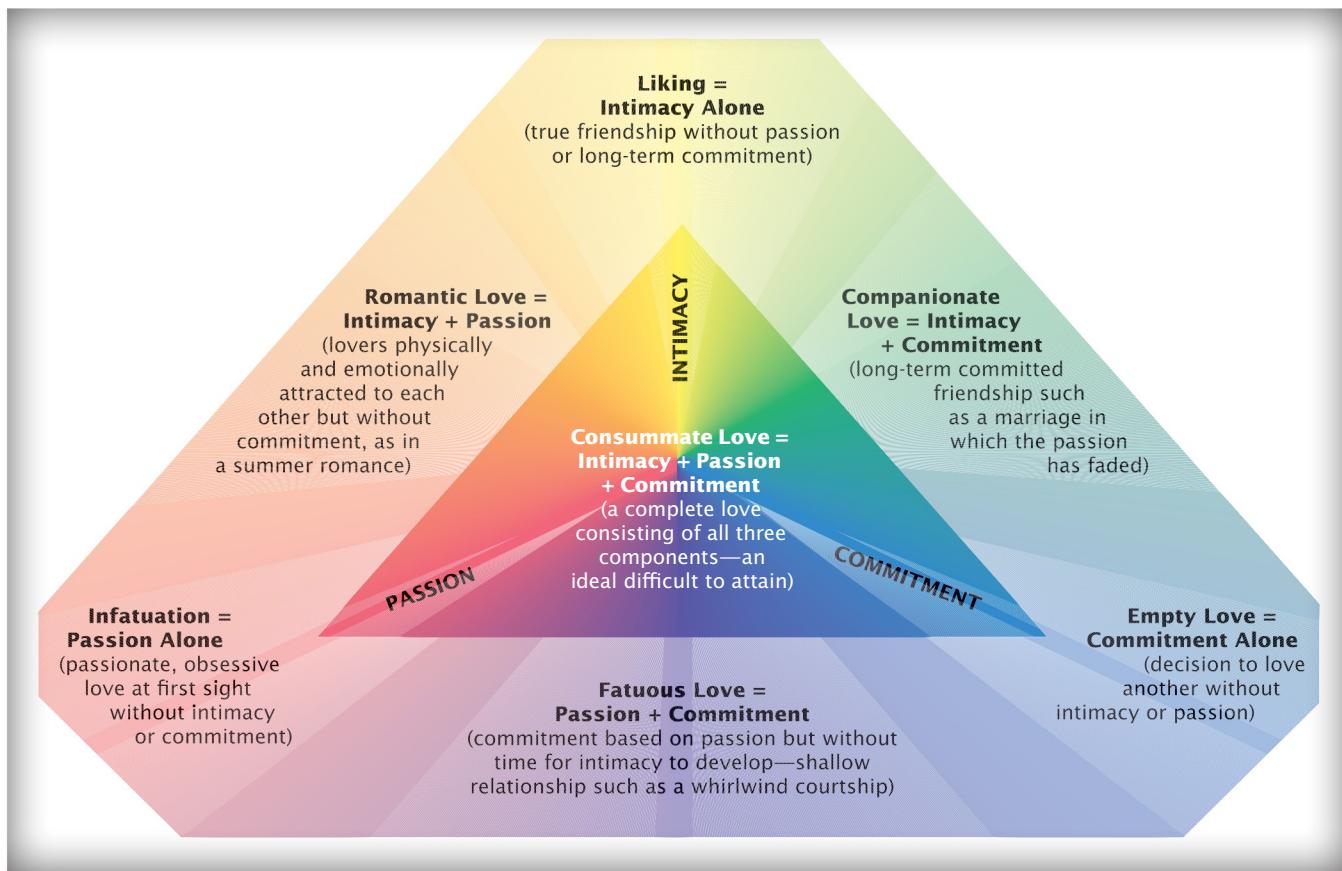


FIGURE 16.7
A Triangular Theory of Love

According to Sternberg (2009), different types of love result when the three basic components in his triangular theory occur in different combinations. The size of the triangle of love increases as love increases, and its shape is determined by the relative strength of each basic component.

marked by a great deal of intimacy and commitment but little passion. *Consummate love* is the most complete and satisfying. It is the most complete because it includes a high level of all three components. It is the most satisfying because the relationship is likely to fulfill many of the needs of each partner. More recently, Sternberg advanced a “*duplex theory*” of love by pairing his triangular theory with a second one that focuses on love as a story. This second theory is based on the fact that in Western cultures, at least, it appears that the success of a relationship depends not just on its perceived characteristics but also on the degree to which those characteristics fit each partner’s ideal story of love, such as that of a prince and princess, or a pair of business partners, for example (Sternberg, 2009).

Cultural factors have a strong influence on the way people think about love and marriage. In North America and Western Europe, for example, the vast majority of people believe that they should love the person they marry. By contrast, in India and Pakistan, about half the people interviewed in a survey said they would marry someone they did not love if that person had other qualities that they desired (Levine et al., 1995). In Russia, only 40 percent of respondents said that they married for love. Most reported marrying because of loneliness, shared interests, or an unplanned pregnancy (Baron & Byrne, 1994). Many such cultural differences in the role of love in marriage are likely to continue, but others seem to be disappearing (Hatfield & Rapson, 2006).

SOCIAL INFLUENCE

What social rules shape our behavior?

So far, we have considered social cognition, the mental processes associated with people’s perceptions of, and reactions to, other people. Let’s now explore *social influence*, the process through which individuals and groups directly and indirectly influence a person’s thoughts, feelings, and behavior. Research has shown, for example, that suicide rates increase following

Clothing and Culture

The social norms that guide how people dress and behave in various situations are part of the culturally determined socialization process described in the chapter on human development. The process is the same worldwide. Parents, teachers, peers, religious leaders, and others communicate their culture's social norms to children, but differences in those norms result in quite different behaviors from culture to culture.

C3899 Sandra Gaetke Deutsche Presse-Agentur/
Newscom



well-publicized suicides (Chen et al., 2010; Collings & Kemp, 2010) and that murder rates increase after well-publicized homicides (Jamieson, Jamieson, & Romer, 2003). Do these correlations mean that media coverage of violence triggers similar violence? As described in the chapter on learning, televised violence can play a causal role in aggressive behavior, but there are other reasons to believe that murders or suicides stimulate imitators when they become media events. For one thing, many of the people who kill themselves after a widely reported suicide are similar to the original victim in some respect (Cialdini, 2008). For example, after German television reported a story about a young man who committed suicide by jumping in front of a train, there was a dramatic increase in the number of young German men who committed suicide in the same way (Schmidtke & Hafner, 1988). This phenomenon—known as “copycat” violence—illustrates the effects of social influence.

Social Norms

The most common yet subtle form of social influence is communicated through social norms. **Social norms** are learned, socially based rules that tell people what they should or should not do in various situations (Hogg, 2010). Parents, teachers, members of the clergy, peers, and other agents of culture transmit these social norms (Schmidt & Tomasello, 2012). Because of the power of social norms, people often follow them automatically. In North America and the United Kingdom, for example, social norms tell us that we should get in line to buy a movie ticket rather than crowd around the box office window. They also lead us to expect that others will do the same. By informing people of what is expected of them and others, social norms make social situations clearer, more predictable, and more comfortable (Schultz et al., 2007).

Robert Cialdini (2007) has described social norms as either descriptive or injunctive. *Descriptive norms* indicate how most other people actually behave in a given situation. They tell us what actions are common in the situation and thereby implicitly give us permission to act in the same way. The fact that most people do not cross a street until the green light or “walk” sign appears is an example of a descriptive norm. *Injunctive norms* give more specific information about the actions that others find acceptable and those that they find unacceptable. Subtle pressure exists to behave in accordance with these norms. A sign that reads “Do not cross on red” or the person next to you saying the same thing is an example of an injunctive norm (Ecker & Buckner, 2014; Simons-Morton,

social norms Learned, socially based rules that prescribe what people should or should not do in various situations.



Deindividuation

Robes, hoods, and group rituals help create deindividuation in these members of the Ku Klux Klan by focusing their attention on membership in their organization and its values. The hoods also hide their identities, which reduces their sense of personal responsibility and accountability and makes it easier for them to engage in hate crimes and other cowardly acts of bigotry. Deindividuation operates in other groups, too, ranging from lynch mobs and terrorist cells to political protesters, urban rioters, and even members of so-called "flash mobs." Through deindividuation, people appear to become "part of the herd," and they may do things that they might not do on their own (Spears et al., 2001).

David Leeson/The Image Works

et al., 2014). Sometimes both kinds of norms operate at the same time. There is evidence, for example, that how much college students use tobacco and alcohol is influenced both by how much they think other students drink and smoke (descriptive norms) and whether they think that their close friends approve of these behaviors (injunctive norms) (Etcheverry & Agnew, 2008; Neighbors et al., 2008).

One particularly powerful social norm is *reciprocity*, the tendency to respond to others as they have acted toward you (Cialdini & Griskevicius, 2010). Restaurant servers often take advantage of this social norm by leaving some candy with the bill. Customers who receive this gift tend to reciprocate by leaving a larger tip than customers who don't get candy (Strohmetz et al., 2002). The strength of the reciprocity norm appears to increase when people are reminded of their own mortality. In one study, when people were exposed to themes about dying, the size of the tip they left for a server was more strongly associated with the level of service they received—larger tips for good service, smaller tips for poor service (Schindler, Reinhard, & Stahlberg, 2013). This finding is consistent with the terror management theory we discussed earlier.

Though the reciprocity norm probably exists in every culture, other social norms are less universal (Adam, Shirako, & Maddux, 2010; Miller, 2001). For instance, people around the world differ greatly in terms of the physical distance they keep between themselves and others while talking. People from South America usually stand much closer to each other than do people from North America. And as suggested in the chapter on psychological disorders, behavior that is considered normal and friendly in one culture may be seen as offensive or even abnormal in another.

The social influence exerted by social norms creates orderly social behavior, but social influence can also lead to a breakdown in order. For example, **deindividuation** is a psychological state in which a person becomes "submerged in the group" and loses the sense of individuality (Baumeister & Bushman, 2014). When people experience deindividuation, they become emotionally aroused and feel intense closeness with their group. This increased awareness of group membership may lead people to follow the group's social norms, even if those norms promote antisocial behavior (Reimann & Zimbardo, 2011). Normally mild-mannered adults may throw rocks at police during political protests, and youngsters who would not ordinarily commit hate crimes have done so as part of gangs. Such behavior—whether physical or verbal—becomes more extreme as people feel less identifiable, as they often do in crowds, in dark environments, or online (Naquin, Kurtzberg, & Belkin, 2010; Zhong, Bohns, & Gino, 2010). An analysis of newspaper accounts of lynchings in the United States over a 50-year period showed that larger lynch mobs were more savage and vicious than smaller ones (Mullen, 1986). Deindividuation provides an example of how, given the right circumstances, quite normal people can engage in destructive, even violent behavior.

Conformity and Compliance

When people change their behavior or beliefs to match those of other members of a group, they are said to conform. **Conformity** occurs as a result of unspoken group pressure, real or imagined (Forsyth, 2013). You probably have experienced group pressure when everyone around you stands to applaud a performance that you thought was not particularly great. You may conform by standing as well, though no one told you to do so; the group's behavior creates a silent but influential pressure to follow suit. **Compliance**, in contrast, occurs when people adjust their behavior because of a request. The request can be clear and direct, such as "Please do me a favor," or it can be more subtle, as when someone simply looks at you in a way that lets you know that the person needs a favor.

Conformity and compliance are usually generated by spoken or unspoken social norms. In a classic experiment, Muzafer Sherif (1937) charted the formation of a group norm by taking advantage of a visual illusion: if you look at a fixed point of light in a pitch-dark room, the light will appear to move. Estimates of how far the light seems to move tend to stay the same over time if an observer is alone. But when Sherif tested several people at once, asking each person to say aloud how far the light moved on repeated trials,

deindividuation A psychological state occurring in group members that results in loss of individuality and a tendency to do things not normally done when alone.

conformity Changing one's behavior or beliefs to match those of others, generally as a result of real or imagined (though unspoken) group pressure.

compliance Adjusting one's behavior because of a direct request.

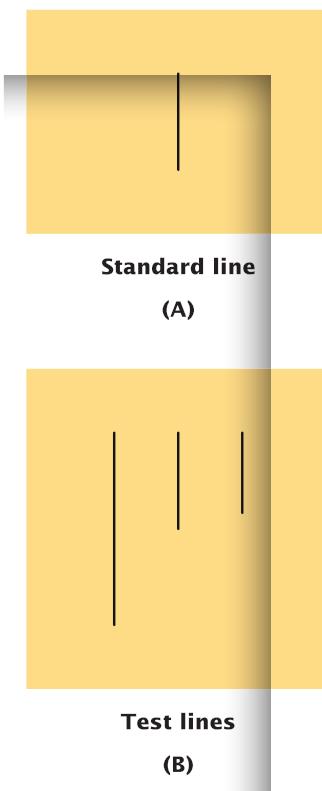


FIGURE 16.8
Types of Stimulus Lines Used in Experiments by Asch

TRY THIS Participants in Asch's experiments saw a new set of lines like these on each trial. The middle line in Part B matches the one in Part A, but when several of Asch's assistants claimed that a different line matched, so did many of the participants. Try re-creating this experiment with four friends. Secretly ask three of them to say that the test line on the left matches the standard line, then show this drawing to all four. Did the fourth person conform to the group norm? If not, do you think it was something about the person, the length of the incorrect line chosen, or both that led to nonconformity? Would conformity be more likely if the first three people had chosen the test line on the right? (Read on for more about this possibility.)

their estimates tended to converge; they had established a group norm. Even more important, when individuals who had been in the group were later tested alone, they continued to be influenced by this norm.

In another classic experiment, Solomon Asch (1956) explored what people do when faced with a norm that is obviously wrong. The participants in this experiment saw a standard line like the one in Figure 16.8(A); then they saw a display like that in Figure 16.8(B). Their task was to pick out the line in the display that was the same length as the one they had first been shown.

Each participant performed this task in a small group of people who posed as fellow participants but who were actually the experimenter's assistants. There were two conditions. In the control condition, the real participant responded first. In the experimental condition, the participant did not respond until after the other people did. The experimenter's assistants chose the correct response on six trials, but on the other twelve trials they all gave the same, obviously incorrect response. So on twelve trials, each participant was confronted with a "social reality" created by a group norm that conflicted with the physical reality created by what the person could clearly see. Only 5 percent of the participants in the control condition ever made a mistake during this easy perceptual task. However, among participants who heard the assistants' incorrect responses before giving their own, about 70 percent made at least one error by conforming to the group norm. An analysis of 133 studies conducted in seventeen countries reveals that conformity in Asch-type situations has declined somewhat in the United States since the 1950s but that it still occurs (Cialdini et al., 2001).

Why Do People Conform?

Why did so many people in Asch's experiment give incorrect responses when they were capable of near-perfect performance? One possibility, called *public conformity*, is that they didn't really believe in their responses but gave them simply because it was the socially desirable thing to do. Another possibility is that the participants experienced *private acceptance*. Perhaps they used the other people's responses as a guide, became convinced that their own perceptions were wrong, and actually changed their minds. Which possibility is more likely? Morton Deutsch and Harold Gerard (1955) reasoned that if people still conformed even when the other group members couldn't hear their response, then Asch's findings must reflect private acceptance, not just public conformity. Actually, although conformity does decrease when people respond privately, it doesn't disappear (Deutsch & Gerard, 1955). So people sometimes say things in public that they don't believe in, but hearing other people's responses also appears to influence their private beliefs (Moscovici, 1985). Such effects may not be long lasting, however. One study found that private conformity to a group's opinion lasted for no more than three days after an Asch-like experiment (Huang, Kendrick, & Yu, 2014).

Why are group norms so powerful? Research suggests several influential factors (Forsyth, 2013). First, people are motivated to be correct, and group norms provide information about what is right and wrong. Second, people want others to like them, so they may seek favor by conforming to the social norms that those others have established (Hewlin & Faison, 2009). Third, conforming to group norms may increase a person's sense of self-worth, especially if the group is valued or prestigious (Cialdini & Goldstein, 2004). The process may occur without our awareness (Lakin & Chartrand, 2003). For example, observations of interviews by former talk show host Larry King revealed that he tended to imitate the speech patterns of high-status guests but not low-status ones (Gregory & Webster, 1996). Finally, social norms affect the distribution of social rewards and punishments (Cialdini, 2008). From childhood on, people in many cultures learn that going along with group norms is good and earns rewards. (These positive outcomes presumably help compensate for not always saying or doing exactly what we please.) People also learn that breaking a norm may bring punishments ranging from scoldings for small transgressions to imprisonment for violation of social norms that have been translated into laws.

When Do People Conform?

People do not always conform to group influence. In the Asch studies, for example, nearly 30 percent of the participants did not go along with the assistants' obviously wrong judgments. Countless experiments have probed the question of what combinations of people and circumstances do and do not lead to conformity.

TRY THIS

Ambiguity, or uncertainty, is important in determining how much conformity will occur. As the features of a situation become less clear, people rely more and more on others' opinions, and conformity to a group norm becomes increasingly likely (Forsyth, 2013). You can demonstrate this aspect of conformity on any street corner. First, create an ambiguous situation by having several people look at the sky or the top of a building. When passersby ask what is going on, be sure everyone excitedly reports seeing something interesting but fleeting—perhaps a faint flashing light or a tiny, shiny high-flying object. If you are especially successful, conforming newcomers will begin persuading other passersby that there is something fascinating to be seen.

If ambiguity contributes so much to conformity, though, why did so many of Asch's participants conform to a judgment that was clearly wrong? The answer has to do with the *unanimous* nature of the group's judgment and the number of people expressing that judgment. Specifically, people experience intense pressure to conform as long as all the other group members agree with each other. If even one other person in the group disagrees with the majority view, conformity drops greatly. When Asch (1951) arranged for just one assistant to disagree with the others, fewer than 10 percent of the real participants conformed. Once unanimity is broken, it becomes much easier to disagree with the majority, even if the other nonconformist does not agree with the person's own view (Baumeister & Bushman, 2014).

Conformity also depends on the *size of the majority*. Asch (1955) demonstrated this phenomenon by varying the number of assistants in the group from one to fifteen. Conformity to incorrect social norms grew as the number of people in the group increased. However, most of the growth in conformity occurred as the size of the majority rose from one to about three or four members. This effect probably occurs because pressure to conform has already reached a peak after someone has heard three or four people agree. Hearing more people confirm the majority view has little additional social impact (Latané, 1981).

Conformity can also occur through *minority influence*, by which a minority of group members influences the behavior or beliefs of the majority (Hogg, 2010). This phenomenon is less common than majority influence, but when members of a numerical minority

Mass Conformity

The faithful who gather at Mecca, at the Vatican, and at other holy places around the world exemplify the power of religion and other social forces to produce conformity to group norms.

Nabeel Turner/The Image Bank/Getty Images; AP Images/L'Osservatore Romano



are established group members, agree with one another, and persist in their views, they can be influential (Hogg, 2010; Mucchi-Faina & Pagliaro, 2008). Perhaps because the views of a numerical minority are examined especially carefully by the rest of the group (Crano, 2012), minority-influenced change often takes a while. Even then, the amount of change tends to be small (Crano, 2012) and is most likely to occur when those in the minority are perceived by the majority to be loyal group members (Crano & Seyranian, 2009).

Does gender affect conformity? Early research suggested that women conform more than men, but the gender difference stemmed mainly from the fact that the tasks used in those studies were often more familiar to men than to women. This fact is important because people are especially likely to conform when they are faced with an unfamiliar situation (Kassin, Fein & Markus, 2014). Those studies also usually required people to make their responses aloud so that everyone knew if they had conformed or not. When the experimental tasks are equally familiar to both genders and when people can make their responses privately, no male-female differences in conformity are found. Accordingly, it has been suggested that gender differences in public conformity are based not on a genuine difference in reactions to social pressure but rather on men's desire to be seen as strong and independent and women's desire to be seen as cooperative (Hogg, 2010; Kenrick, Neuberg, & Cialdini, 2010).

Creating Compliance

In the experiments just described, the participants experienced psychological pressure to conform to the views or actions of others even though no one specifically asked them to do so. In contrast, *compliance* involves changing what you say or do because of a direct request.

How is compliance brought about? Many people believe that the direct approach is always best: if you want something, ask for it. But salespeople, political strategists, social psychologists, and other experts have learned that often the best way to get something is to ask for something else. Three examples of this strategy are the foot-in-the-door technique, the door-in-the-face technique, and the lowball technique (Cialdini & Griskevicius, 2010).

The *foot-in-the-door technique* works by getting a person to agree to small requests and then working up to larger ones. This technique was well illustrated in a study in which a woman asked strangers to keep an eye on her shopping bag while she stepped away for a few minutes. The strangers were twice as likely to agree to do this favor if the woman had first asked them "what time is it?" Apparently, by granting that first small favor they become much more likely to do a somewhat larger one (Dolinski, 2012).

Why should granting small favors lead to the granting of larger ones? First, people are usually far more likely to comply with a request that doesn't cost much in time, money, effort, or inconvenience. Second, complying with a small request makes people think of themselves as being committed to the cause or issue involved (Burger & Guadagno, 2003). This occurs through the processes of self-perception and cognitive dissonance discussed earlier (Cialdini & Griskevicius, 2010). Doing the first favor changes the way that people see themselves, that is, as people who are likely to do favors for others (Forsyth, 2013).

The *foot-in-the-door technique* can be amazingly effective. Steven Sherman (1980) created a 700 percent increase in the rate at which people volunteered to work for a charity simply by first getting them to say that in a hypothetical situation they would volunteer if asked. For some companies, the foot in the door is a request that potential customers merely answer a few questions; the request to buy something comes later. Others offer a small gift, or "door opener," as salespeople call it. Acceptance of the gift not only gives the salesperson a foot in the door but also may activate the reciprocity norm: many people who get something for free feel obligated to reciprocate by buying something, especially if the request to do so is delayed for a while (Cialdini & Griskevicius, 2010; Guadagno et al., 2001).

The *door-in-the-face technique* offers a second effective way of obtaining compliance (Cialdini, 2008). This strategy begins with a request for a favor that is likely to be refused.



Promoting Compliance

Have you ever been asked to sign a petition favoring some political, social, or economic cause? Supporters of these causes know that people who comply with this small request are the best people to contact later with requests to do more. Complying with larger requests is made more likely because it's consistent with the signer's initial commitment to the cause. If you were contacted after signing a petition, did you agree to donate money or become a volunteer?

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The person making the request then concedes that this favor was too much to ask and substitutes a lesser alternative, which is what the person really wanted in the first place! Because the person appears willing to compromise and because the second request seems small in comparison with the first one, it is more likely to be granted than if it had been made at the outset. The door-in-the-face strategy is at the heart of bargaining among political groups and between labor and management (Ginges et al., 2007).

The third method, called the *lowball technique*, is commonly used by car dealers and other businesses (Forsyth, 2013). The first step in this strategy is to get people to say that they will do something, such as purchase a car. Once this commitment is made, the cost of fulfilling it is increased, often because of an “error” in computing the car’s price. Why do buyers end up paying much more than originally planned for “lowballed” items? Apparently, once people commit themselves to do something, they feel obligated to follow through, especially when the initial commitment was made in public and when the person who obtained that commitment also makes the higher-cost request (Burger & Cornelius, 2003).

OBEDIENCE

How far will people go in obeying authority?

Compliance involves a change in behavior in response to a request. In the case of **obedience**, the behavior change comes in response to a *demand* from an authority figure (Sanderson, 2010). In the 1960s, Stanley Milgram developed a laboratory procedure at Yale University to study obedience. For his first experiment, he used newspaper ads to find forty male volunteer participants. They ranged in age from twenty to fifty, lived in the local community, and included professionals, white-collar businessmen, and unskilled workers (Milgram, 1963).

Imagine you are one of the people who answered the ad. When you arrive for the experiment, you join a fifty-year-old man who has also volunteered and has been scheduled for the same session. The experimenter explains that the purpose of the experiment is to examine the effects of punishment on learning. One of you—the “teacher”—will help the “learner” remember a list of words by administering an electric shock whenever the learner makes a mistake. Then the experimenter turns to you and asks you to draw one of two cards out of a hat. Your card says, “TEACHER.” You think to yourself that this must be your lucky day.

Now the learner is taken into another room and strapped into a chair, and, as illustrated in Figure 16.9, electrodes are attached to his arm. You are shown a shock generator with thirty switches. The experimenter explains that the switch on the far left administers a mild, 15-volt shock and that each succeeding switch increases the shock by 15 volts. The one on the far right delivers 450 volts. The far left section of the shock generator is labeled “Slight shock.” Looking across the panel, you see “Moderate shock,” “Very strong shock,” and at the far right, “Danger—severe shock.” The last two switches are ominously labeled “XXX.” The experimenter explains that you, the teacher, will begin by reading a list of word pairs to the learner. Then you will go through the list again, presenting just one word of each pair. The learner will have to say which word went with it. After the first mistake, you are to throw the switch to deliver 15 volts of shock. Each time the learner makes another mistake, you are to increase the shock by 15 volts.

You begin, following the experimenter’s instructions. But after the learner makes his fifth mistake and you throw the switch to give him 75 volts, you hear a loud moan. At 90 volts, the learner cries out in pain. At 150 volts, he screams and asks to be let out of the experiment. You look to the experimenter, who says, “Proceed with the next word.”

No shock was actually delivered in Milgram’s experiments. The learner was always an employee of the experimenter, and the moans and other sounds of pain came from a prerecorded tape. But you do not know that. What would you do in this situation? Suppose you continue and eventually deliver 180 volts. The learner screams that he cannot



FIGURE 16.9
Studying Obedience
in the Laboratory

In this photograph from Milgram’s original experiment, a man is being strapped into a chair with electrodes on his arm. Although participants in the experiment didn’t know it, the man was actually the experimenter’s assistant and received no shock.

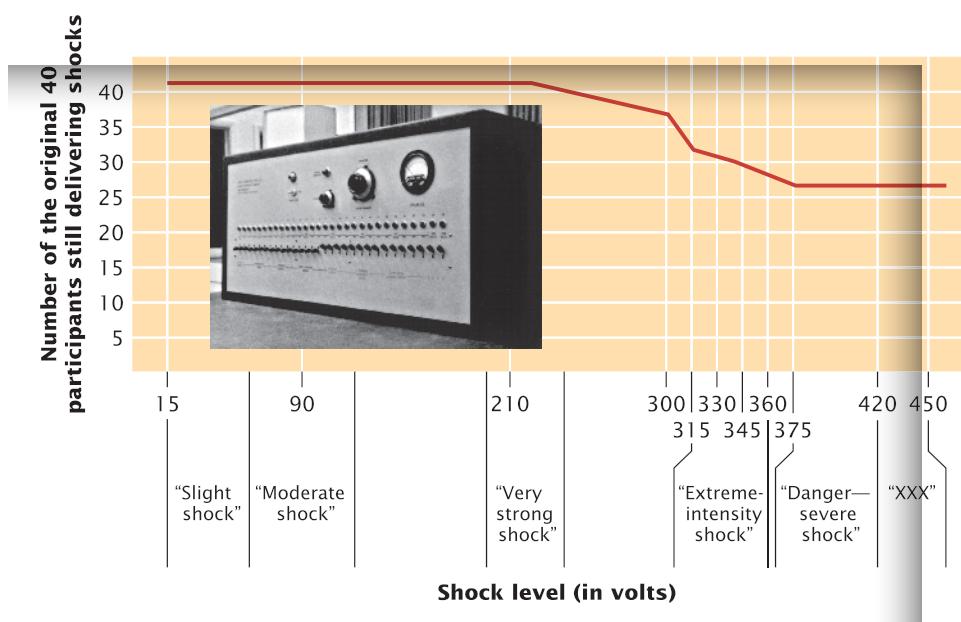
From the film *Obedience* © 1968 by Stanley Milgram, © renewed 1993 by Alexandra Milgram, and distributed by Alexander Street Press. Permission granted by Alexandra Milgram

obedience Changing behavior in response to a demand from an authority figure.

FIGURE 16.10
Results of Milgram's Obedience Experiment

When Milgram asked a group of college students and a group of psychiatrists to predict how participants in his experiment would respond, they estimated that fewer than 2 percent would go all the way to 450 volts. In fact, 65 percent of the participants did so. What do you think you would have done in this situation?

From the film "Obedience" © 1968 by Stanley Milgram, © renewed 1993 by Alexandra Milgram, and distributed by Alexander Street Press. Permission granted by Alexandra Milgram.



stand the pain any longer and starts banging on the wall. The experimenter says, “You have no other choice; you must go on.” Would you continue? Would you keep going even when the learner begged to be let out of the experiment and then fell silent? Would you administer 450 volts of potentially deadly shock to an innocent stranger just because an experimenter demanded that you do so? Figure 16.10 shows that only five participants in Milgram’s experiment stopped before 300 volts and that twenty-six out of forty (65 percent) went all the way to the 450-volt level. The decision to continue was difficult and stressful for the participants. Many protested repeatedly. But each time the experimenter told them to continue, they did so.

Factors Affecting Obedience

Milgram had not expected so many people to deliver such apparently intense shocks. Was there something about his procedure that produced this high level of obedience? To find out, Milgram and other researchers varied the original procedure in a number of ways and discovered that the degree of obedience was affected by several aspects of the situation and procedure.

Experimenter Status and Prestige

Perhaps the experimenter’s status as a Yale University professor helped produce high levels of obedience in Milgram’s original experiment (Blass & Schmitt, 2001). To test this possibility, Milgram rented an office in a rundown building in Bridgeport, Connecticut. He then placed a newspaper ad for research sponsored by a private firm. There was no mention of Yale. In all other ways, the experimental procedure was identical to the original.

Under these less impressive circumstances, the level of obedience dropped, but not as much as Milgram expected: 48 percent of the participants continued to the maximum level of shock, compared with 65 percent in the original study. Milgram concluded that people are willing to obey orders to do great harm to another person even when the authority making the demand is not especially reputable or prestigious.

The Behavior of Other People

To study how the behavior of fellow participants might affect obedience, Milgram (1965) created a situation in which there appeared to be three teachers. Teacher 1 (in reality, a



Proximity and Obedience

Milgram's research showed that close physical proximity to an authority figure is one of several factors that can enhance obedience to authority (Rada & Rogers, 1973). This proximity principle is used in the military, where no one is ever far away from the authority of a higher-ranking person.

US Marines Photo/Alamy



May I Take Your Order?

In February 2004, the managers of four fast-food restaurants in Boston received calls from someone claiming to be a police detective on the trail of a robbery suspect. The caller said the suspect might be one of the restaurant's employees and told the managers to strip search all of them for evidence of guilt. The calls turned out to be hoaxes, but every manager obeyed this bizarre order, apparently because it appeared to come from a legitimate authority. In two similar cases, residents of a special needs school were given unnecessary electric shock treatments on the telephoned orders from a hoaxer, and hospital nurses obeyed medical treatment orders given by a teenager who claimed to be a doctor (Associated Press, 2007a; Kenrick, Neuberg, & Cialdini, 2010).

Photodisc/Getty Images

research assistant) read the words to the learner. Teacher 2 (another research assistant) stated whether the learner's response was correct. Teacher 3 (the actual participant) was to deliver shock when the learner made mistakes. At 150 volts, when the learner began to complain that the shock was too painful, Teacher 1 refused to participate any longer and left the room. The experimenter asked him to come back, but he refused. The experimenter then instructed Teachers 2 and 3 to continue by themselves. The experiment continued for several more trials. However, at 210 volts, Teacher 2 said that the learner was suffering too much and also refused to participate further. The experimenter then told Teacher 3 (the actual participant) to continue the procedure. In this case, only 10 percent of the participants (compared with 65 percent in the original study) continued to deliver shock all the way up to 450 volts. In other words, as research on conformity would suggest, the presence of others who disobey appears to be the most powerful factor in reducing obedience.

The Behavior of the Learner

A recent reanalysis of data from Milgram's obedience studies (Packer, 2008) found that although the supposedly shocked learner's increasingly intense expressions of pain had no effect on whether the participants disobeyed the experimenter, the learner's stated desire to be released from the experiment did affect disobedience. In fact, among those participants who refused to continue to shock the learner, almost 37 percent of them disobeyed at the 150-volt level, which was when the learner first said he wanted to be released from the experiment. So it appears that perceiving a victim's pain does not reduce obedience to authority but being reminded of a victim's right to be released from the experiment does.

Personality Characteristics

Were the participants in Milgram's original experiment heartless creatures who would have given strong shocks even if there had been no pressure on them to do so? Quite the opposite; most of them were nice people who were influenced by experimental situations to behave in apparently antisocial ways. A more recent illustration of this phenomenon occurred among a few soldiers who were assigned to guard or interrogate prisoners in Afghanistan and Iraq.

Still, not everyone is equally obedient to authority. For example, people who display what we described earlier as *authoritarianism* are more likely than others to obey an experimenter's instructions to shock the learner (Blass, 2000; Dambrun & Valnetine, 2010). Further support for this idea comes from findings that German soldiers who may have obeyed orders to kill Jews during World War II displayed more authoritarianism than other German men of the same age and background (Steiner & Fahrenberg, 2000). In contrast, a more recent study that repeated Milgram's experimental procedures (Burger, 2009) found that the participants who were less likely to obey orders to harm the learner were also the ones who were concerned about others and predisposed to have *empathy*—that is, to understand or experience another person's emotional state (Davis, 1994). On the other hand, people who score higher on neuroticism, a personality dimension discussed in the personality chapter, are more likely to be obedient in a Milgram-type situation (Zeigler-Hill et al., 2013).

Evaluating Obedience Research

How relevant are Milgram's fifty-year-old obedience studies today? Consider the obedience to authority that operated on 9/11, when some people returned to their offices in the World Trade Center after hearing an ill-advised public address announcement telling them to do so. Most of these people died as a result. Similar kinds of obedience continue to be observed in experiments conducted in many countries, from Europe to the Middle East, with female as well as male participants, and even in simulated game shows and lifelike virtual

environments (Beauvieux, Courbat, & Oberelé, 2012; Burger, 2009; Dambrun & Valentine, 2010). In short, people may be as likely to obey orders today as they were when Milgram conducted his research (Blass, 2004, 2009; Burger, 2009). Nevertheless, there is still debate over the ethics and meaning of Milgram's work.

Questions About Ethics

LINKAGES Is it ethical to deceive people to learn about their social behavior? (a link to Research Methods in Psychology)

Although the "learners" in Milgram's experiment suffered no discomfort, the participants did. Milgram (1963) observed participants "sweat, stutter, tremble, groan, bite their lips, and dig their fingernails into their flesh" (p. 375). Against the potential harm inflicted by Milgram's experiments stand the potential gains. For example, people who learn about Milgram's work often take his findings into account when deciding how to act in social situations (Sherman, 1980). But even if social value has come from Milgram's studies, a question remains: Was it ethical for Milgram to treat his participants as he did?

In the years before his death in 1984, Milgram defended his experiments (e.g., Milgram, 1977). He argued that the way he dealt with his participants after the experiment prevented any lasting harm. For example, he explained to them that the learner did not experience any shock; in fact, the learner came in and chatted with each participant. On a later questionnaire, 84 percent of the participants said that they had learned something important about themselves and that the experience had been worthwhile. Still, the committees charged with protecting human participants in research today would be unlikely to approve Milgram's experiments as they were originally done, and less controversial ways to study obedience have now been developed (Blass, 2004; Elms, 2009).

Questions About Meaning

Do Milgram's dramatic results mean that most people are putty in the hands of authority figures and that most of us would blindly follow inhumane orders from our leaders? Some critics have argued that Milgram's results cannot be interpreted in this way because his participants knew they were in an experiment and may simply have been playing a cooperative role. If so, the social influence processes identified in his studies may not explain obedience in the real world today (Berkowitz, 1999).

In fact, it has been proposed that what looks like blind obedience in Milgram's experiments might be better explained by the *social identity theory* we described earlier (Reicher, Haslam, & Smith, 2012). According to this interpretation, when participants administered what they thought were severe shocks it could have been because they identified more strongly with the experimenter and the scientific community he represented than with the person they were supposedly shocking. When the research was not associated with Yale and when others refused to continue, participants might have identified more with the learner than with the experimenter and so were less willing to continue. This line of reasoning offers quite a different perspective on why people sometimes follow brutal orders. These people may simply see themselves and their leaders as part of the same group and their willingness to follow orders reflects the conscious pursuit of that group's goals. This alternative explanation of Milgram's results has yet to be directly tested, but that will surely happen in the near future.

Most psychologists believe, however, that Milgram demonstrated a basic truth about human behavior—namely, that under certain circumstances people are capable of unspeakable acts of brutality toward other people (Benjamin & Simpson, 2009). Sadly, examples abound. And one of the most horrifying aspects of human inhumanity—whether it is the Nazis' campaign of genocide against Jews seventy years ago or the campaigns of terror under way today—is that the perpetrators are not necessarily demented, sadistic fiends. Most of them are normal people who have been prompted by economic, political, or religious influences and the persuasive power of their leaders to behave in a demented and fiendish manner (Skitka, 2010). (For a summary of Milgram's results, plus those of studies on conformity and compliance, see "In Review: Types of Social Influence.")

In short, inhumanity can occur even without pressure to obey. A good deal of people's aggressiveness toward other people appears to come from within. Let's consider human aggressiveness and some of the circumstances that influence its expression.

IN REVIEW

TYPES OF SOCIAL INFLUENCE

Type	Definition	Key Findings
Conformity	A change in behavior or beliefs to match those of others	<p>In cases of ambiguity, people develop a group norm and then adhere to it.</p> <p>Conformity occurs because people want to be right, because they want to be liked by others, and because conformity to group norms is usually reinforced.</p> <p>Conformity usually increases with the ambiguity of the situation as well as with the unanimity and size of the majority.</p>
Compliance	Adjusting one's behavior because of a direct request	<p>Compliance increases with the foot-in-the-door technique, which begins with a small request and works up to a larger one.</p> <p>The door-in-the-face procedure can also be used. After making a large request that is denied, the person substitutes a less extreme alternative that was desired all along.</p> <p>The lowball approach also elicits compliance. An oral commitment for something is first obtained, then the person claims that only a higher-cost version of the original request will suffice.</p>
Obedience	A change in behavior in response to an explicit demand, typically from an acknowledged authority figure	<p>People may inflict great harm on others when an authority demands that they do so.</p> <p>Even when people obey orders to harm another person, they often agonize over the decision.</p> <p>People are most likely to disobey orders to harm someone else when they see another person disobey.</p>

In Review Questions

- Joining the end of a ticket line is an example of _____, whereas forming two lines when a theater employee requests it is an example of _____.
- Seeing someone disobey a questionable order makes people _____ likely to obey the order themselves.
- Pricing your used car for more than you expect to get but then agreeing to reduce it to make a sale is an example of the _____ approach to gaining compliance.

AGGRESSION

Are people born aggressive?

Aggressive behavior, more commonly known as **aggression**, is any action intended to harm another person (DeWall, Anderson, & Bushman, 2013). It is all too common. About 1.6 million violent crimes are committed each year in the United States alone, including nearly 90,000 rapes and about 15,000 murders (U.S. Census Bureau, 2012). In fact, homicide is the third leading cause of death for people in the United States between the ages of 15 and 24 (Heron, 2007). One of the most disturbing aspects of these figures is that about 85 percent of all murder victims knew their assailants and that over 70 percent of rapists were romantic partners, friends, relatives, or acquaintances of their victims (U.S. Department of Justice, 2007). Further, as many as one-third of married people and a significant proportion of dating couples in the United States have engaged in aggressive acts toward each other that range from pushing, shoving, and slapping to beatings and the threatened or actual use of weapons (Cornelius & Resseguie, 2007; Durose et al., 2005).

aggressive behavior (aggression)

An act that is intended to harm another person.

Why Are People Aggressive?

Sigmund Freud proposed that aggression is an instinctive biological urge that builds up in everyone and must be released. Evolutionary psychologists offer a different view, suggesting that in prehistoric times, aggression helped people compete for mates, thus ensuring the survival of their genes in the next generation (Liddle, Shackelford, & Weekes-Shackelford, 2012; Malamuth & Addison, 2001). Through natural selection, they say, aggressive tendencies have been passed on through countless generations.

Evolutionary theories of aggression are popular, but even evolutionary theorists recognize that “nature” alone cannot fully account for aggression. “Nurture,” in the form of environmental factors, also plays a role in when and why people are aggressive. We know this partly because there are large differences in aggression from culture to culture. The murder rate in Venezuela, for example, is more than nine times higher than it is in the United States, and the U.S. murder rate is about three times as high as the rate in Canada or the United Kingdom (United Nations Office on Drugs and Crime, 2010). These data suggest that even if aggressive *impulses* are universal, the appearance of aggressive *behavior* reflects the influence of both nature and nurture, including the degree to which people learn to control aggressive tendencies (DeWall, Anderson, & Bushman, 2013). No equation can predict exactly when people will be aggressive, but research has revealed a number of important biological, learning, and environmental factors that combine in various ways to produce aggression in various situations.

Genetic and Biological Mechanisms

There is strong evidence for hereditary influences on aggression, especially in nonhuman animals (Bushman & Huesmann, 2010). In one study, the most aggressive members of a large group of mice were interbred and then the most aggressive of their offspring were interbred. After this procedure was followed for twenty-five generations, the resulting animals would immediately attack any mouse put in their cage. Continuous inbreeding of the least aggressive members of the original group produced animals that were so nonaggressive that they would refuse to fight even when attacked (Lagerspetz & Lagerspetz, 1983). Research that rated the aggressiveness of human twins who had been raised together or apart suggests that there is a genetic component to aggression in people as well (Hudziak et al., 2003; Vierikko et al., 2006). However, other research suggests that people do not necessarily inherit the tendency to be aggressive. Instead, they may inherit certain aspects of temperament, such as impulsiveness, or certain aspects of brain chemistry that in turn make aggression more likely (Alia-Klein et al., 2009; Eisenberger et al., 2007; Hennig et al., 2005).

Several parts of the brain influence aggression (Carré, Murphy, & Hariri, 2013). One of these is the limbic system, which includes the amygdala, the hypothalamus, and related areas. Damage to these structures may produce *defensive aggression*, which includes heightened aggressiveness toward stimuli that are not usually threatening or a decrease in the responses that normally inhibit aggression (Coccaro, 1989; Siever, 2008). The cerebral cortex may also be involved in aggression (e.g., Pietro et al., 2000; Séguin & Zelazo, 2005). Hormones such as *testosterone*—the masculine hormone that is present in both sexes—may also play an important role in aggression (Carré, Murphy, & Hariri, 2013). Aggressive behavior increases or decreases dramatically with the amount of testosterone in the human bloodstream. This may be because people with high levels of testosterone have more difficulty controlling their impulses (Mehta & Beer, 2010). Criminals who commit violent crimes have higher levels of testosterone than those whose crimes are nonviolent (Schiltz, Witzel, & Bogerts, 2011), and murderers with higher levels of testosterone are more likely than others to have planned their crimes before committing them (Dabbs, Riad, & Chance, 2001).

Testosterone's most significant and durable influence may be through its impact on early brain development. One natural test of this hypothesis occurred when pregnant women were given testosterone in an attempt to prevent miscarriage. As a result, their children were exposed to high doses of testosterone during prenatal development. Figure 16.11 shows that these children grew up to be more aggressive than their same-sex siblings who

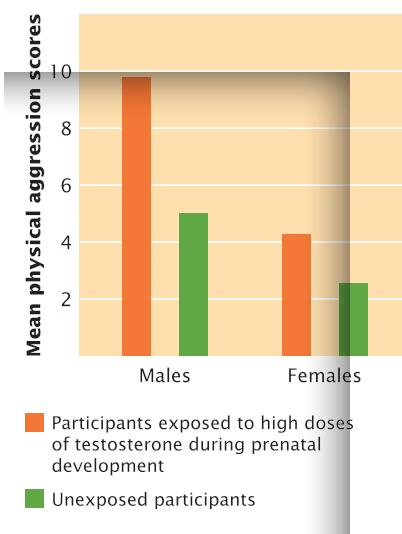


FIGURE 16.11
Testosterone and Aggression

In the study illustrated here, the children of women who had taken testosterone during pregnancy to prevent miscarriage became more aggressive than the mothers' other children of the same sex who had not been exposed to testosterone during prenatal development. This outcome appeared in both males' and females' development (Reinisch, Ziembala-Davis, & Sanders, 1991).

were not exposed to testosterone during prenatal development (Reinisch, Ziemba-Davis, & Sanders, 1991). Another study found that men who had been exposed to high levels of testosterone before birth were more likely than other men to be aggressive toward their female partners (Cousins, Fugere, & Franklin, 2009). Still other research has linked low levels of the neurotransmitter serotonin with high levels of impulsive aggression in both humans and nonhuman animals (Bushman & Bartholow, 2010; Carver, Johnson, & Joormann, 2008). It is not yet clear, though, whether the low serotonin level is a cause or a consequence of aggression (Kassin, Fein, & Markus, 2008). Aggression may vary in relation to other biological factors, too. For example, married couples have been found to show more aggression when blood sugar levels drop (Bushman et al., 2014).

Aggression can also be influenced by drugs that affect the central nervous system. For example, even relatively small amounts of alcohol can greatly increase some people's aggressiveness (Gallagher et al., 2014; Shorey et al., 2013). Canadian researchers have found that in almost 70 percent of the acts of aggression they studied, the aggressors had been drinking alcohol. And the more alcohol the aggressors consumed, the more aggressive they were (Wells, Graham, & West, 2000). No one knows exactly why alcohol increases aggression, but research suggests that the drug may affect areas of the brain that normally inhibit aggressive responses (Bartholow & Heinz, 2006; Graham et al., 2006; Lau, Pihl, & Peterson, 1995).

Learning and Cultural Mechanisms

Biological factors may increase or decrease the likelihood of aggression, but cross-cultural research makes it clear that learning also plays a role. Aggressive behavior is much more common in individualist than in collectivist cultures, for example (Oatley, 1993). Cultural differences in the expression of aggression appear to stem partly from differing cultural values (Cohen, 1998). For example, the Utku (an Inuit culture) view aggression in any form as a sign of social incompetence. In fact, the Utku word for "aggressive" also means "childish" (Oatley, 1993). The effects of culture on aggression can also be seen in the fact that the amount of aggression in a given culture changes over time as cultural values change (Matsumoto, 2000).

In addition, people can learn aggressive responses by watching other people (Bushman & Huesmann, 2014). Children, in particular, learn and perform many of the aggressive responses they see modeled by others. Bandura's Bobo-doll experiments, which are described in the chapter on learning, provide impressive demonstrations of the power of observational learning. The significance of observational learning is also highlighted by studies described in that chapter on the effects of televised violence. For example, the amount of violent content eight-year-olds watch on television predicts aggressiveness in these children even fifteen years later (Bushman & Huesmann, 2010; Huesmann et al., 2003). Fortunately, not everyone who sees aggression becomes aggressive. Individual differences in temperament, the modeling of nonaggressive behavior by parents, and other factors can reduce the effects of violent television.

Reward or punishment can also alter the frequency of aggressive acts. People become more aggressive when rewarded for aggressiveness and less aggressive when punished for aggression (Bushman & Bartholow, 2010). In short, a person's life experiences, including culturally transmitted teachings, combine with daily rewards and punishments to influence whether, when, and how aggressive acts occur (Bettencourt et al., 2006; Bushman & Bartholow, 2010).

Aggression and Video Games

Some scientists claim that violent video games may increase aggressiveness in those who play them (Anderson & Gentile, 2008; DeWall, Anderson, & Bushman, 2013; DeLisi et al., 2013). In fact, some argue that violent games can produce even more aggression than violent television can because games allow players to practice simulated aggression and have it rewarded by reaching the games' next level (e.g., Bushman & Anderson, 2007; Lin, 2013).

Following Adult Examples

Learning to express aggression is especially easy for children who live in countries plagued by war or sectarian violence because they see aggressive acts modeled for them all too often.

Mario Tama/Getty Images



Claims like these are supported by the results of more than a hundred correlational studies and laboratory experiments. This research suggests that playing video games not only increase players' aggressive thoughts, feelings, and actions, but may make them less likely to help others and less sensitive to other people's pain and suffering.

Is exposure to violent video games actually causing greater aggressiveness or is it just that more aggressive people are the ones inclined to play them (Rieger et al., 2014)? Skeptical scientists point out that correlational studies do not allow us to draw conclusions about cause and effect. Even laboratory experiments have been criticized because their highly controlled methods may not reflect—and their results may therefore not apply to—the game-playing that goes on in the real world (Ferguson, 2010; Goldstein, 2001). Further, some of these experiments have found *no* effect of violent video games on aggression (e.g., Ferguson & Rueda, 2010). Some psychological scientists argue, too, that even if there is a statistically significant cause-and-effect relationship between violent video game-playing and aggression, it is not very strong when compared to the impact of other social forces, such as what children learn when they see their families and friends behaving aggressively (Ferguson & Kilburn, 2010; Sherry, 2001). Given the evidence available so far, it seems reasonable to say that violent video games probably do have some impact on the people who play them, but additional research will be required to determine its exact nature and intensity (Gentile et al., 2014).

When Are People Aggressive?

In general, people are more likely to be aggressive when they are both physically aroused and experiencing a strong emotion such as anger (DeWall, Anderson, & Bushman, 2013). People tend either to lash out at those who make them angry or to displace, or redirect, their anger toward children, pets, or other defenseless targets. However, aggression can also be made more likely by other forms of emotional arousal. One emotion that has long been considered to be a major cause of aggression is *frustration*, which occurs when we are prevented from reaching some goal.

Frustration and Aggression

Suppose that a friend interrupts your studying for an exam by asking to borrow a book. If things have been going well that day and you are feeling confident about the exam, you will probably be friendly and helpful. But what if you are feeling frustrated because your friend's

visit was the fifth interruption in the last hour? Under these emotional circumstances, you may react aggressively, perhaps snapping at your startled visitor for bothering you.

Your aggressiveness in this situation would be predicted by the **frustration-aggression hypothesis**, which suggests that frustration leads to aggression (Dollard et al., 1939). Research on this hypothesis has shown that it is too simple and too general, however. For one thing, frustration sometimes produces depression and withdrawal, not aggression (Berkowitz, 1998). In addition, not all aggression is preceded by frustration (Berkowitz, 1994).

After many years of research, Leonard Berkowitz suggested two modifications designed to increase the accuracy of the frustration-aggression hypothesis. First, he proposed that it may be stress in general, not just frustration, that is involved in aggression. Stress, he said, produces a readiness for aggression that may or may not be translated into aggressive behavior (Berkowitz, 1998). Once this readiness exists, however, aggression can be more easily triggered by environmental stimuli. The triggering stimuli might be guns or knives, televised scenes of people arguing, violent song lyrics, or other cues associated with aggression. In other words, neither stress alone nor environmental cues alone are enough to set off aggression. When combined, however, they often do. Support for this aspect of Berkowitz's theory has been quite strong (DeWall, Anderson, & Bushman, 2013).

Second, Berkowitz argues that the direct cause of most kinds of aggression is negative feelings, or *negative affect* (Berkowitz, 1998). Research suggests that the more negative affect people experience, regardless of what caused it, the stronger is their readiness to be aggressive. Participants in one study experienced negative affect caused by the pain of immersing their hands in ice water. They became more aggressive than participants in a control group whose hands were in water of room temperature (Berkowitz, 1998).

Generalized Arousal

Imagine that you have just jogged for three miles. You are hot, sweaty, and out of breath, but you are not angry. Still, the physiological arousal caused by jogging may increase the probability that you will become aggressive if, say, a passerby shouts an insult (Zillmann, 1988). Why? The answer lies in a phenomenon described in the chapter on motivation and emotion: Arousal from one experience may carry over to an independent situation, producing what is called *excitation transfer*. So the physiological arousal caused by jogging may intensify your reaction to an insult (Harrison, 2003).

LINKAGES What role does arousal play in aggression? (a link to Motivation and Emotion)

By itself, however, generalized arousal does not lead to aggression. It is most likely to produce aggression when the situation contains some reason, opportunity, or target for aggression (Zillmann, 2003). In one study, for example, people engaged in two minutes of vigorous exercise. Then they had the opportunity to deliver an electrical shock to another person. The participants chose high levels of shock only if they were first insulted (Zillmann, Katcher, & Milavsky, 1972). Apparently, the arousal resulting from the exercise made aggression more likely; the insult "released" it.

Other research suggests that men who are aroused by watching violent pornography may be more likely to commit rape or other forms of aggression against women. In one experiment, for example, male participants were told that a person in another room (actually the experimenter's assistant) would be performing a learning task and that they were to administer an electric shock every time the person made a mistake. The intensity of shock could be varied (as in the Milgram studies, no shock actually reached the assistant), but participants were told that changing the intensity would not affect the speed of learning. So the shock intensity (and presumed pain) that they chose to administer was considered to be a measure of aggression. Before the learning trials began, some participants watched a film in which several men had sex with the same woman, against her will. These participants' aggressiveness toward women during the learning experiment

frustration-aggression hypothesis A proposition stating that frustration always leads to some form of aggressive behavior.

environmental psychology The study of the effects of the physical environment on people's behavior and mental processes.

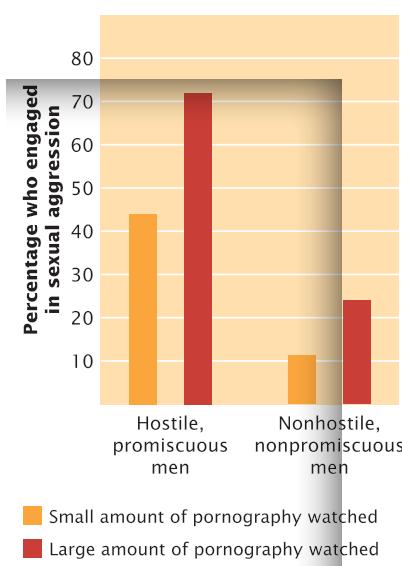


FIGURE 16.12
Pornography and Sexual Aggression

By itself, extensive exposure to pornography does not increase most men's sexual aggressiveness. Such aggressiveness is much more likely, however, among men who not only view or read a lot of pornography but also are hostile toward women and are sexually promiscuous (Malamuth, 1998).

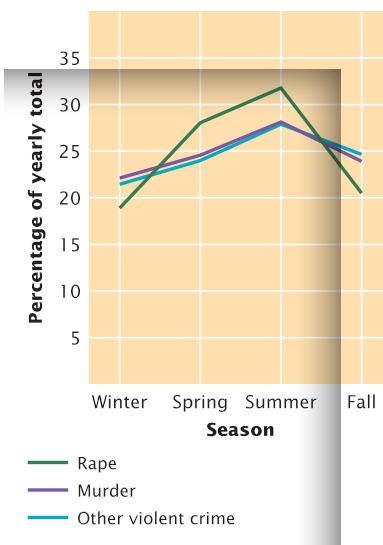


FIGURE 16.13
Temperature and Aggression

Studies from around the world indicate that aggressive behaviors are most likely to occur during the hottest months of the year. These studies support the hypothesis that environmental factors can affect aggression.

was greater than that of men who did not watch the film (Donnerstein, 1984). There was no parallel increase in aggression against other men, indicating that the violent pornography didn't create a generalized increase in aggression but did create an increase in aggressiveness directed toward women.

Such effects do not appear in all men, however (Ferguson & Hartley, 2009; Seto, Maric, & Barbaree, 2001). One study of about 2,700 men in the United States found that men who are not hostile toward women and who rarely have casual sex showed little, if any, change in sexual aggressiveness after viewing aggressive pornography. In contrast, among men who are high in promiscuity and hostility, watching aggressive pornography was followed by a dramatic increase in the chances that these men would engage in sexual aggression (Malamuth, Addison, & Koss, 2000; Malamuth, Hald, & Koss, 2012). In fact, 72 percent of the men who frequently used pornography and were high in promiscuity and hostility had actually engaged in sexually aggressive acts (see Figure 16.12). Viewing pornography appears to have similar effects on convicted sex offenders who have been placed on probation or released on parole, and the effects are especially pronounced among those who had committed the most serious sex crimes (Kingston et al., 2008).

These findings support the notion that aggression is not caused solely by a person's characteristics or by the particular situation a person is in. Instead, the occurrence and intensity of aggression are determined by the joint influence of individual characteristics and environmental circumstances (Ferguson & Dyck, 2012; Klimesmith, Kasser, & McAndrew, 2006).

Environmental Influences on Aggression

The link between stress, arousal, and the likelihood of aggressive behavior suggests that stressful environmental conditions can create enough arousal to make aggressive behavior more likely (Bushman & Bartholow, 2010). This possibility is one of the research topics in **environmental psychology**, the study of the relationship between people's physical environment and their behavior (Bell et al., 2000). One aspect of the environment that clearly affects social behavior is the weather, especially temperature. High temperatures are a source of stress: as Figure 16.13 indicates, murder and other violent crimes are most likely to occur during the hottest months of the year (Anderson & DeLisi, 2011; Bushman, Wang, & Anderson, 2005). Athletes tend to behave more aggressively in hotter weather, and even hearing words associated with high temperatures—such as “boiling” or “roasting”—is associated with increased aggressiveness (Dewall & Bushman, 2009; Larrick et al., 2011).

Aggressiveness is also associated with noisy environments, especially if the noise is unpredictable and irregular (Bushman & Bartholow, 2010), and with living in crowded and unpleasant conditions such as those often found in prisons and some psychiatric hospitals (Baumeister & Bushman, 2014; Yuma, 2010).

ALTRUISM AND PROSOCIAL BEHAVIOR

What motivates people to help one another?

Acts of terrorism provide horrifying examples of human behavior at its worst. But like all tragedies, they draw responses that provide inspiring examples of human behavior at its best. For example, in the moments just after the 2013 Boston Marathon bombing, Carlos Arrendondo, a spectator at the race, ran to the side of a severely injured young man and saved the man's life by using his own clothes to make a tourniquet to stop the bleeding, then stayed with the man until medical help arrived (CNN April 17, 2013). Arrendondo ignored the possibility that he himself could have been killed had another bomb exploded nearby. In the following days, police officers, medical personnel, and others came to Boston from all over the United States to help survivors.



A Young Helper

Even before their second birthday, some children offer help to those who are hurt or crying by snuggling, patting, or offering food or even their own teddy bears. Their helpful actions are shaped by the norms established by their families and the broader culture (Grusec & Goodnow, 1994).

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Actions such as these are examples of **prosocial behavior**, also known as **helping behavior**, which is defined as any act that is intended to benefit another person. Helping can range from picking up dropped packages to donating a kidney. Closely related to prosocial behavior is **altruism**, an unselfish concern for another's welfare (Penner, Dovidio, et al., 2005). Let's consider some of the reasons behind helping and altruism, along with some of the conditions under which people are most likely to help others.

Why Do People Help?

The tendency to help others begins early in life, although at first it is not automatic. Children have to learn to be helpful (Pettygrove et al., 2013). In most cultures, very young children usually help others only when they are asked to do so or are offered a reward (Grusec, Davidov, & Lundell, 2002). Still, observational studies have shown that many children as young as eighteen months will spontaneously help a friend, a family member, or even a stranger (e.g., Dunfield & Kuhlmeier, 2010; Hepach, Vaish, & Tomasello, 2012). As they grow older, children use helping to gain social approval, and their efforts at assisting others become more elaborate. The role of social influence in the development of helping is seen as children follow the examples set by people around them (McCullough & Tabak, 2010). In addition, children are usually praised and given other rewards for helpfulness but are scolded for selfishness. Eventually most children come to believe that being helpful is good and that they are good when they are helpful. By the late teens, people often assist others even when no one is watching and no one will know that they did so (Grusec, Davidov, & Lundell, 2002).

There are a number of possible reasons why people help even when they cannot expect any external rewards for doing so. Let's consider some of the most prominent ones.

Arousal: Cost-Reward Theory

The **arousal: cost-reward theory** proposes that people find the sight of a victim distressing and anxiety-provoking and that this experience motivates them to do something to reduce the unpleasant arousal (Dovidio et al., 2006; Piliavin et al., 1981). Before rushing to a victim's aid, however, the bystander will first evaluate two aspects of the situation: the costs associated with helping and the costs (to the bystander and the other person) of not helping. Whether the bystander actually helps depends on the outcome of this evaluation (Dovidio et al., 1991). If the costs of helping are low (as in picking up someone's dropped grocery bag) and the costs of not helping are high (as when the other person is physically unable to do this alone), the bystander will almost certainly help. However, if the costs of helping are high (as when the task is to load a heavy box into a car) and the costs of not helping are low (as when the other person is obviously strong enough to do the job alone), the bystander is unlikely to offer help. One of the strengths of the arousal: cost-reward theory is that it is broad enough to explain several factors that affect assistance.

One such factor is the *clarity of the need for help* (McCullough & Tabak, 2010). In a laboratory study of this factor, undergraduate students waiting alone in a campus building saw what appeared to be an accident involving a window washer. The man screamed as he and his ladder fell to the ground, then he clutched his ankle and groaned in pain. All the students looked out of the window to see what had happened, but only 29 percent of them did anything to help. Other students witnessed the same "accident" but with one important added element: the man said he was hurt and needed help. In this case, more than 80 percent of the participants came to his aid (Yakimovich & Saltz, 1971). Why so many? Apparently, this one additional cue eliminated any uncertainty about whether assistance was needed. The man's more obvious need for assistance served to raise the perceived costs of not helping him, thus making helping more likely.

If this laboratory study seems unrealistic, consider the March 2000 case of a sixty-two-year-old woman in Darby, Pennsylvania. She was walking to the grocery store when she was pushed from behind by an attacker. She fended him off and then did her shopping as usual.

prosocial behavior (helping behavior) Any act that is intended to benefit another person.

altruism An unselfish concern for another's welfare.

arousal: cost-reward theory A theory attributing people's prosocial behavior to their efforts to reduce unpleasant arousal in the face of someone's need or suffering, while also considering the costs involved.

It was only when she got home and her daughter saw the handle of a knife protruding from her back that she realized that the assailant had stabbed her! No one in the grocery store said anything to her about the knife, let alone offered to help. Why? The most likely explanation is that the woman did nothing to suggest that assistance was necessary.

The *presence of others* also has a strong influence on the tendency to help. Somewhat surprisingly, however, their presence tends to make assistance less likely (Garcia et al., 2002). For example, twelve people in Richmond, California, simply watched as a fifteen-year-old girl was beaten and gang-raped outside her high school homecoming dance ("Dozen People Watched," 2009). The next year, in New York City, a man was stabbed while trying to help a woman who was being attacked. As the man lay bleeding to death on the sidewalk, at least twenty-five people walked by without trying to help him (ABC News, 2010). Whenever such cases are publicized, journalists and social commentators express dismay about the cold, uncaring attitudes that seem to exist among people who live in big cities.

That description may apply to some people, but research stimulated by such cases has revealed a social phenomenon that offers a different explanation of why all those passersby took no action to help. This phenomenon, called the **bystander effect**, makes an individual less likely to help in an emergency when there are many other people present (Snyder & Dwyer, 2013). Why does the bystander effect occur? One explanation is that each witness assumes someone else will take responsibility for helping the victim. This *diffusion of responsibility* among all the witnesses leaves each witness feeling less obligated to help and thus lowers the perceived cost of not helping (Dovidio et al., 2006; Dovidio & Penner, 2001). So if you're ever in need of help, especially in a crowd, it is important not only to actually ask for help, but also to tell a specific onlooker to take specific action (e.g., "You, in the yellow shirt, please call an ambulance!").

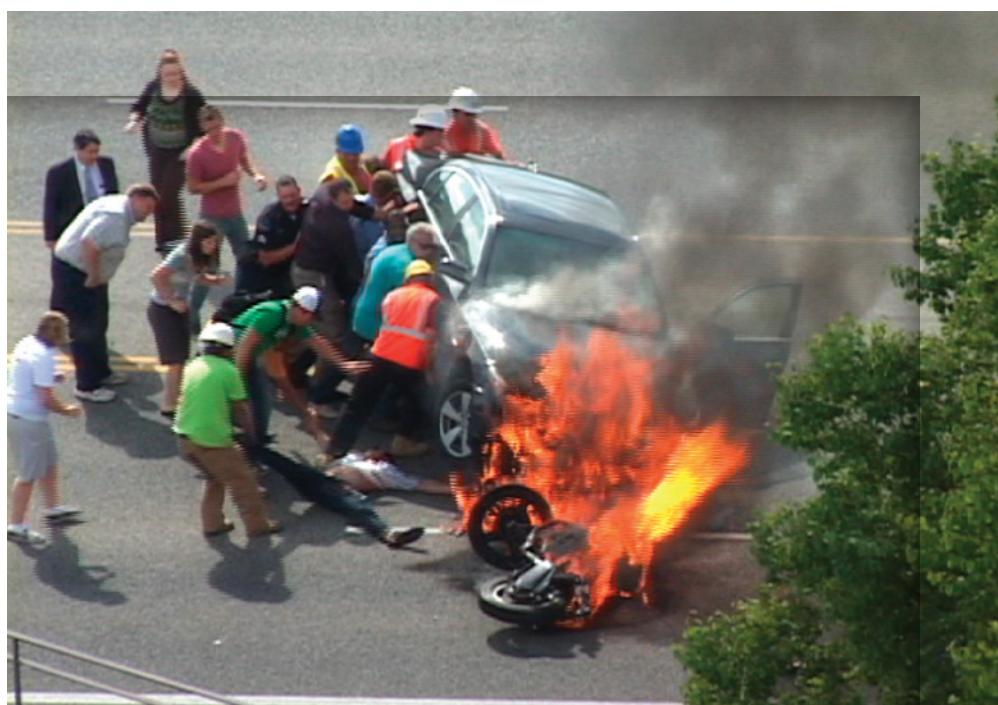
The degree to which the presence of other people will suppress the tendency to help may depend on who those other people are. When they are strangers, perhaps poor communication interferes with assistance. Many people have difficulty speaking to strangers, particularly in an emergency, and without speaking, they have difficulty knowing what the others intend to do. According to this logic, if people are with friends rather than strangers, they should be less embarrassed, more willing to discuss the problem, and more likely to help.

No Diffusion of Responsibility Here

TRY THIS Although people are sometimes callous and indifferent to the plight of others in emergencies, they are sometimes just the opposite. This September 2011 photo shows bystanders lifting a burning car to reach a motorcyclist who had been trapped underneath it after a collision. In light of our previous discussion, make a list of the social, personality, cultural, and situational factors that might have prevented diffusion of responsibility in this case and led these people to risk their lives to pull the injured man to safety.

AP Images/Chris Garff

bystander effect A phenomenon in which the chances that someone will help in an emergency decrease as the number of people present increases.





Creating Empathy

The amount of empathy a person feels for you can depend on several factors, including the words you choose when asking for help (Guéguen & Lamy, 2011), whether you physically touch the other person while asking (Schirmer et al., 2011), whether you're a member of the same social ingroup (Cikara, Botvinik, & Fiske, 2011; Cikara, Bruneau, & Saxe, 2011), and whether the person sees you as a potential threat (Agthe, Spörrle, & Maner, 2010; van de Ven, Zeelenberg, & Pieters, 2010). The person's actual or perceived socio-economic status can also be influential (Ma, Wang, & Han, 2011; Rucker, Dubois, & Galinsky, 2011; Stellar et al., 2012).

Dougal Waters/Photographer's Choice RF/Getty Images

In a study designed to test this idea, an experimenter left a research participant in a waiting room, either alone, with a friend, with a stranger, or with a stranger who was actually the experimenter's assistant (Latané & Rodin, 1969). The experimenter then stepped behind a curtain into an office. For a few minutes, she could be heard opening and closing the drawers of her desk, shuffling papers, and so on. Then there was a loud crash and she screamed, "Oh, my god—my foot, I—I can't move it. Oh, my ankle—I can't get this—thing off me." Then the participant heard her groan and cry.

Would the participant go behind the curtain to offer assistance? Once again, people were most likely to help if they were alone. When one other person was present, participants were more likely to communicate with one another and offer help if they were friends than if they were strangers. When the stranger was the experimenter's assistant—who had been instructed not to help—very few participants offered to help. Other studies have confirmed that bystanders' tendency to help increases when they know one another (Rutkowski, Gruder, & Romer, 1983).

Empathy-Altruism Helping Theory

Sometimes, costs and rewards are not the major causes of a decision to help or not help. **Empathy-altruism helping theory** considers some of these situations. This theory suggests that people are more likely to engage in altruistic, or unselfish, assistance—even at a high cost—if they feel empathy toward the person in need (Batson, 2010). In one experiment illustrating this phenomenon, students listened to a recorded interview in which a young woman told how her parents had died in an automobile accident, leaving no life insurance (Batson et al., 1997). She said that she was trying to take care of her younger brother and sister while going to college but that time and money were so tight that she might have to quit school or give up her siblings for adoption. None of this was true, but the participants were told that it was. Before hearing the recording, half the participants were given information about the woman that would increase their empathy for her; the other half were not. After listening to the recording, all participants were asked to help the woman raise money for herself and her siblings. Consistent with the empathy-altruism helping theory, more participants in the empathy group offered to help than did those in the control group.

Were the students who offered help in this experiment being utterly unselfish or could there have been other reasons for their apparent altruism? This is a hotly debated question. Some researchers dispute the claim that this study illustrated truly altruistic helping. They suggest instead that people help in such situations for more selfish reasons, such as relieving the distress they experienced after hearing of the woman's problems (Maner et al., 2002). The final verdict on this question is not yet in.

Evolutionary Theory

The evolutionary approach to psychology offers yet another way to explain prosocial behavior. According to this approach, many human social behaviors are a reflection of actions that contributed to the survival of our prehistoric ancestors (Maner & Kenrick, 2010). At first glance, it might not seem reasonable to apply evolutionary theory to prosocial behavior and altruism, because helping others at the risk of our own well-being does not appear adaptive. If we die while trying to save others, it will be their genes, not ours, that will survive. In fact, according to Darwin's concept of the "survival of the fittest," helpers—and their genes—should have disappeared long ago. Today's evolutionary theorists suggest, however, that Darwin's thinking about natural selection focused too much on the survival of the fittest *individuals* and not enough on the survival of their genes in *others*. Accordingly, the concept of survival of the fittest has been replaced by the concept of *inclusive fitness*, the survival of one's genes in future generations (Hamilton, 1964; West & Gardner, 2010). Because we share genes with our relatives, helping—or even dying for—a cousin, a sibling, or (above all) our own child increases the likelihood that at least some of our genetic characteristics will be passed

empathy-altruism helping theory A theory suggesting that people help others because they feel empathy toward them.

on to the next generation through the beneficiary's future reproduction (Buck, 2011). So *kin selection*, or helping a relative survive, may produce genetic benefits for the helper even if it provides no personal benefits (Krebs, 2005).

There is considerable evidence that kin selection occurs among birds, squirrels, and other animals. The more closely the animals are related, the more likely they are to risk their lives for one another. Studies in a wide variety of cultures show the same pattern of prosocial behavior among humans (Krebs, 2005). For example, people in the United States have been three times as likely to donate a kidney to a relative as to a nonrelative (Borgida, Conner, & Monteufel, 1992).

Biopsychosocial Factors in Prosocial Behavior

However, helpfulness is not found in every member of every family. These differences could be the result of many factors, one of which is genetics. It is unlikely that a single "altruism gene" will ever be found, but it does appear that sets of genes do indirectly influence the likelihood of helping behavior (Thompson, Hurd, & Crespi, 2013). For example, there are slight genetic differences among people in how their brain cells respond to certain neurotransmitters, such as dopamine. Further, genetic differences in dopamine receptor systems have been associated with differences in prosocial behavior (Knafo, Israel, & Ebstein, 2011).

Other brain chemicals may also influence helping. One of these is *oxytocin*, a chemical that is made and released by certain cells of the brain's hypothalamus, and that also can act as a hormone in the endocrine system (Carter, 2014; Ganter & Pfaff, 2012). One study looked at the relationship between oxytocin and people's willingness to help a person who had been excluded from a game (Riem et al., 2013). They found that higher oxytocin levels were associated with more prosocial behavior, but only among people who had had positive relationships with their parents in childhood. Here is yet another example of the interaction of nature and nurture in many kinds of social behaviors, including helping.

"In Review: Prosocial Behavior" summarizes the three main theories of why people help and the conditions under which they are most likely to do so, but other factors may be at play as well. Let's briefly consider some of these.

Personality and Prosocial Behavior

To put it simply, it appears that people with certain personality traits are more likely than others to be helpful. Consider, for example, the Christians who risked their lives to save Jews from the Nazi Holocaust during World War II. Researchers interviewed these rescuers many years later and compared their personalities with those of people who had a chance to save Jews but did not do so (Fagin-Jones & Midlarsky, 2007; Oliner & Oliner, 1988). The rescuers were found to have more empathy, more concern about others, a greater sense of responsibility for their own actions, and greater confidence that their efforts would succeed. Louis Penner and his associates (Penner, 2002; Penner & Finkelstein, 1998) have found that these kinds of personality traits predict a broad range of helping, from how quickly bystanders intervene in an emergency to how much time volunteers spend helping AIDS patients. Consistent with the arousal: cost-reward theory, these personality characteristics are correlated with people's estimates of the costs of helping and not helping. For example, empathic individuals usually estimate the costs of not helping as high, and people who are confident about their ability to help usually rate the costs of helping as low (Penner et al., 1995).

Environmental Factors and Prosocial Behavior

The setting in which people live can affect how willing they are to be helpful. Research conducted in several countries has shown that people in urban areas are generally less helpful than those in rural areas (Aronson, Wilson, & Akert, 2013). Why? The explanation probably has more to do with the stressors found in cities than with city living itself. For example, one study of twenty-four U.S. cities showed that the greater a city's size and density

(number of people per square mile), the less likely people were to help others. Helping was also much less likely in cities where stressful environmental conditions exist (e.g., population density, noise) and were greatest (Levine, Reysen, & Ganz, 2008). One possible explanation is that crowding, noise, and other urban stressors create too much stimulation. To reduce this stimulation, people may pay less attention to their surroundings, including less attention to individuals who need help (Anker & Feeley, 2011). Another explanation is that stressful environments create bad moods—and generally speaking, people in bad moods are less likely to help than people who feel good (Brethel-Haurwitz & Marsh, 2014;Forgas, Dunn, & Granland, 2008).

IN REVIEW

PROSOCIAL BEHAVIOR

Theory	Basic Premise	Important Variables
Arousal: cost-reward	People help others in order to reduce the unpleasant arousal caused by another person's distress. They attempt to minimize the costs of doing this.	Factors that affect the costs of helping and of not helping.
Empathy-altruism	People sometimes help others for unselfish reasons if they feel empathy for a person in need. They are motivated by a desire to increase another person's well-being.	The amount of empathy that one person feels for another.
Evolutionary	People help relatives because it increases the chances that the helper's genes will survive in future generations.	The biological relationship between the helper and the recipient of help.

In Review Questions

- If you could save only one person from a burning house, the _____ theory of prosocial behavior would predict that it would be your own child rather than, say, a grandparent.
- Are you more likely to receive help in a nearly empty bus or in a crowded bus terminal?
- People who have empathy for others are _____ likely to be helpful

COOPERATION, COMPETITION, AND CONFLICT

What's the best way to help people cooperate?

cooperation Any type of behavior in which people work together to attain a goal.

competition Any type of behavior in which individuals try to attain a goal while denying others access to that goal.

conflict What occurs when a person or group believes that another person or group interferes with the attainment of a goal.

social dilemmas Situations in which actions that produce rewards for one individual will produce negative consequences for all if they are adopted by everyone.

Helping is one of several ways in which people *cooperate* with one another. **Cooperation** is any type of behavior in which people work together to attain a common goal (Dovidio et al., 2006). For example, several law students might form a study group to help one another pass a difficult exam. But people can also engage in **competition**, trying to attain a goal for themselves while denying that goal to others. So those same students might later compete with one another for a single job opening at a prestigious law firm. Finally, **conflict** results when one person or group believes that another stands in the way of their achieving a goal. When the students become attorneys and represent opposing parties in a legal dispute, they will be in conflict. One way in which psychologists have learned about all three of these behaviors is by studying social dilemmas (Kassin, Fein, & Markus, 2014).

Social Dilemmas

Social dilemmas are situations in which an action that brings rewards for the individual will, if widely adopted, produce negative consequences for the group (Baumiester & Bushman, 2014). For instance, during a drought, individual homeowners are better off in the short run if they water their lawns as often as necessary to keep the grass from dying, but if everyone ignores local water restrictions, there will be no drinking water for anyone



Cooperation, Competition, Conflict, and Cash

Cooperation, competition, and conflict can all be seen on *Survivor*, a television series in which people try to win money by staying the longest in some remote location. Early on, contestants cooperate with members of their own teams, but as more and more people are eliminated, even team members compete with one another. When only two people remain, each stands in the way of the other's goal of winning, so they are in direct conflict.

CBS Photo Archive/Getty Images

in the long run. Social psychologists have studied situations like this by conducting experiments using the two-person "prisoner's dilemma" game.

The Prisoner's Dilemma Game

The **prisoner's dilemma game** is based on a scenario in which two people are separated for questioning immediately after being arrested on suspicion of having committed a serious crime (Bornstein, 2002). The prosecutor believes they are guilty but doesn't have enough evidence to convict them. Each prisoner can either confess or not, but they are told that if they both refuse to confess, each will be convicted of a minor offense and will be jailed for one year. If they both confess, the prosecutor will recommend a five-year sentence for each. However, if one prisoner remains silent and the other confesses to what they did, the prosecutor will allow the confessing prisoner to go free, whereas the other will serve the maximum ten-year sentence.

Each prisoner faces a dilemma. Obviously, the strategy that will guarantee the best *mutual* outcome—short sentences for both prisoners—is cooperation. In other words, neither should confess. But the prisoner who remains silent runs the risk of receiving a long sentence if the other prisoner confesses. Further, the prisoner who confesses will benefit if the other prisoner doesn't talk. In other words, each prisoner has an incentive to compete for freedom by confessing. But if they *both* compete and confess, each will end up going to jail for longer than if they had kept quiet.

In the typical prisoner's dilemma experiment, two people sit at separate control panels. Each of them has a red button and a black button, one of which is to be pushed on each of many trials. Pressing the black button is a cooperative response. Pressing the red button is a competitive response. For example, on a given trial, if both participants press their black buttons, each wins \$5. If both press their red buttons, they earn only \$1. However, if one player presses the red button and the other presses the black button, the one who pressed the red button will win \$10, and the other will win nothing.

Over the course of the experiment, the combined winnings of the players are greatest if each presses the black button—that is, if they cooperate. By pressing the black button, however, a player becomes open to exploitation, because on any trial, the other might press the red button and take all the winnings. So each player stands to benefit the most individually by pressing the red button occasionally.

What happens when people play this game? Overall, there is a strong tendency to respond competitively. People find it difficult to resist the competitive choice on any given trial (Kanazawa & Fontaine, 2013). This choice wins them more money on that trial, but in the long run, they gain less than they would have gained through cooperation.

If acting competitively leads to smaller rewards in the long run, why do people persist in competing? There seem to be two reasons (Komorita, 1984). First, winning more than an opponent does seem to be rewarding in itself. In the prisoner's dilemma game, many people want to outscore an opponent even if the result is that they win less money overall (Insko, Wildschut, & Cohen, 2013). Second, and more important, once several competitive responses are made, the competition seems to feed on itself (Kassinove et al., 2002). Each person becomes distrustful of the other, and cooperation becomes increasingly difficult. The more competitive one person acts, the more competitive the other becomes (McClintock & Liebrand, 1988).

Promoting Cooperation

Communication can reduce people's tendency to act competitively (Pavitt et al., 2007). Unfortunately, however, not all communication increases cooperation, just as not all contact between ethnic groups reduces prejudice. If the communication takes the form of a threat, people may interpret the threat itself as a competitive response and become more likely

prisoner's dilemma game A social dilemma scenario in which mutual cooperation guarantees the best mutual outcome.

to respond competitively (Gifford & Hine, 1997). Furthermore, the communication must be relevant. In one social dilemma study, cooperation increased only when people spoke openly about the dilemma and how they would be rewarded for various responses. Praising one another for past cooperation was most beneficial (Orbell, van de Kragt, & Dawes, 1988).

Interpersonal Conflict

Though social psychologists are applying research on cooperation to help people work more closely together in school, on the job, and in the community, humans do not always cooperate. Conflict is especially likely when people are involved in a *zero-sum game*. This is a situation in which one person's gains are subtracted from the other person's resources. It is called *zero-sum* because when you add up the gains and losses, the result is zero. Election campaigns, lawsuits over a deceased relative's estate, and competition between children for a toy are all examples of zero-sum games.

Interpersonal conflicts can be difficult to resolve and can easily escalate (De Dreu, 2010). This is because, first, people in conflict invest so much time, effort, and commitment in establishing their own point of view that being asked to adjust it in order to compromise seems to be asking too much (Yarenell & Neff, 2013). Second, people often see the problem as due to the other person's hostility or selfishness rather than to an honest difference of opinion (Samuelson & Messick, 1995). Faulty communication is a third reason for the persistence of interpersonal conflicts. Such miscommunication can start a cycle of increasingly provocative actions in which each person believes the other is being aggressive and unfair (Pruitt & Carnevale, 1993). Fourth, there is a tendency to believe that the other person is not really interested in reaching a settlement. This view may become a self-fulfilling prophecy; each side may begin to behave in ways that actually bring about the uncooperative behavior expected from the other side, and the end result may be increasing conflict and eventually, a stalemate (Kennedy & Pronin, 2008).



Social Facilitation

Premier athletes like Victoria Azarenka are able to perform at their best even though large crowds are present. In fact, the crowds probably help them do well, because the presence of others tends to increase arousal, which enhances the performance of familiar and well-learned skills, such as tennis strokes. However, arousal created by an audience tends to interfere with the performance of unfamiliar and poorly developed skills. This is one reason that professional athletes who show flawless grace in front of thousands of fans are likely to freeze up or blow their lines in front of a small production crew when trying for the first time to tape a TV ad or a public service announcement.

epa/Ahmad Yusni/Landov

GROUP PROCESSES

What makes a good leader?

Although Western industrialized cultures tend to emphasize individuals over groups, the fact remains that most important decisions and efforts by governments and businesses in those cultures and elsewhere are made by groups, not individuals (Forsyth, 2013). Sometimes groups function very well. Perhaps you recall the extraordinary teamwork of emergency workers and volunteers that led to dramatic rescues of people trapped by flood waters after Hurricane Sandy struck the Northeast coast of the United States in 2012. At other times, though, groups malfunction, resulting in poor performance and bad and sometimes disastrous decisions. To begin to understand why, let's consider some of the social psychological processes that often occur in groups to alter the behavior of individuals and the quality of their collective efforts.

The Presence of Others

The term **social facilitation** describes circumstances in which the presence of other people can improve performance (Aiello & Douthitt, 2001). For example, people pedal a bicycle faster when there is a competitor, even a virtual one (Snyder, Anderson-Hanley, & Arciero, 2012). This improvement does not always occur, however. In fact, having other people present sometimes hurts performance, a process known as **social interference**. For decades, these results seemed contradictory; then Robert Zajonc (pronounced "ZYE-onze") suggested that both effects could be explained by one process: arousal.

The presence of other people, said Zajonc, increases a person's general level of arousal or motivation (Zajonc, 1965). Why? One reason is that being watched by others increases

our sense of being evaluated, producing worry, which in turn increases emotional arousal (Penner & Craiger, 1992; Uziel, 2007). Arousal increases the tendency to perform those behaviors that are most *dominant*—the ones you know best. This tendency can either help or hinder performance. When you are performing an easy, familiar task, such as riding a bike, increased arousal due to the presence of others should allow you to ride even faster than normal. But when a task is hard or unfamiliar—such as trying new dance steps or playing a newly learned piano piece in front of an audience—the most dominant responses may be incorrect and cause performance to suffer. In other words, the impact of other people on performance depends on whether the task is easy or difficult. It can depend, too, on how people interpret the performance situation. For example, they tend to do better if they see the performance as a chance to show off their skill rather than as an attempt to avoid looking incompetent (Feinberg & Aiello, 2010).

What if a person is not merely in the presence of others but is working with them on some task? In these situations, people often exert less effort than when performing alone, a phenomenon called **social loafing** (Forsyth & Burnette, 2010). Whether the task is pulling on a rope, clapping as loudly as possible, or working together on a class project, people tend to work harder when alone than with others (Price, Harrison, & Gavin, 2006; van Dick et al., 2009). Research in industrial and organizational psychology suggests that social loafing is most likely when large groups work on the same task (making each member's contribution harder to evaluate), when the group is not closely knit, and when members feel they are not being rewarded according to their performance (Mefoh & Nwanosike, 2012; Pearsall, Christian, & Ellis, 2010). Social loafing is less likely when group members like each other and identify with the group and its goals (Hoigaard, Säfvenbom, & Tonnessen, 2006). It is also reduced when harder-working members of a group punish the social loafers with criticism or other negative consequences (Barclay, 2006).

Group Leadership

The role of group leaders is especially important when social loafing and other obstacles threaten to impair the effectiveness of group efforts. A good leader can help a group pursue its goals, but a bad one can get in the way of a group's functioning (Forsyth & Burnette, 2010). What makes a good leader? Psychologists once thought that the personalities of good and bad leaders were about the same, but we now know that certain personality traits often distinguish effective from ineffective leaders. For example, researchers have found that, in general, effective leaders are intelligent, conscientious, success oriented, flexible, and confident (Foti & Hauenstein, 2007; Ones, Dilchert, & Viswesvaran, 2012).

Having particular personality traits does not guarantee good leadership ability, however. People who are effective leaders in one situation may be ineffective in another (Chemers, 2000; Ng, Ang, & Chan, 2008). This is because effective leadership also depends on the characteristics of the group members, the task at hand, and, most important, the interaction between these factors and the leader's style (Van Kleef et al., 2010; Yun, Faraj, & Sims, 2005).

For many years, leadership research focused on two main types of leaders. The first type, called **task-motivated leaders**, provides close supervision, lead by giving orders, and generally discourage group discussion (Yukl & Van Fleet, 1992). Their style may make them unpopular. The second type, called **relationship-motivated leaders**, provide loose supervision, asks for group members' ideas, and are generally concerned with subordinates' feelings. They are usually well liked by the group, even when they must discipline a group member (Kassin, Fein, & Markus, 2014). More recently, additional leadership styles have been identified. One of these styles is seen in *transactional leaders*, whose actions depend on the actions of those they lead. They reward those who behave as the leader wishes and they correct or punish those who don't. There are also *transformational* or *charismatic leaders* (Hogg, 2010). These people concentrate on creating a vision of the group's goals, inspiring others to pursue that vision, and giving their followers reason to respect and admire them.

Do men or women make better leaders? Research by Alice Eagly and her colleagues at first found that, overall, men and women are equally capable leaders (e.g., Eagly & Carli,

social facilitation A phenomenon in which the presence of others improves a person's performance.

social interference A reduction in performance due to the presence of other people.

social loafing Exerting less effort when performing a group task than when performing the same task alone.

task-motivated leaders Leaders who provide close supervision, lead by giving directions, and generally discourage group discussion.

relationship-motivated leaders Leaders who provide loose supervision, ask for group members' ideas, and are generally concerned with subordinates' feelings.

2007). It also looked as though men tend to be more effective when success requires a task-motivated leader, and that women tend to be more effective when success requires a more relationship-motivated leader. In other words, it appeared that people of each gender tend to be most effective when they are acting in a manner consistent with gender-role traditions (Wang et al., 2013). Perhaps the reason was that some people did not like female leaders who act in a “masculine” manner or occupy leadership positions traditionally held by men (Eagly, Makhijani, & Klonsky, 1992).

A somewhat different picture of gender and leadership has emerged from Eagly’s more recent research. For one thing, she found that females are generally more likely than males to display a transformational leadership style. Further, when women display a transactional style, they tend to be more encouraging than transactional male leaders, focusing more on using rewards rather than punishments to modify group members’ behaviors. Finally, and in contrast to earlier findings, Eagly’s results now suggest that women may be slightly more effective leaders overall than men (Ayman, Korabik, & Morris, 2009; Eagly & Szesny, 2009).

LINKAGES

BIOLOGICAL AND SOCIAL PSYCHOLOGY

LINKAGES Can we “see” prejudice in the brain (a link to Biological Aspects of Psychology)

Research in social psychology was once thought to be entirely separate from research on the biological processes that underlie social behavior (Heatherton & Wheatley, 2010). Social psychologists believed it was impossible to reduce complex social psychological processes to the firing of neurons or the secretion of hormones. For their part, biological psychologists, more commonly known as *neuroscientists*, viewed the study of social psychology as having little, if any, relevance to the understanding of, say, behavioral genetics or the functioning of the nervous system. Over the past two decades, however, scientists in both subfields have begun to take a closer look at each other’s research and at how their subfields are linked. The result has been the emergence of a field of study known as **social neuroscience** or *social cognitive neuroscience* (Lieberman, 2012). Researchers in this field focus on the influence of social processes on biological processes and on the influence of biological processes, including genetics, on social psychological phenomena (e.g., Bilderbeck et al., 2014; Cikara & Van Bavel, 2014; Mikolajczak et al., 2010).

For example, using brain-scanning technology, researchers have found that European Americans who are prejudiced against African Americans show significantly more activity in the amygdala—a structure involved in emotion—when looking at pictures of black people than when looking at pictures of white people (Cunningham et al., 2004; Phelps et al., 2000). They have also found that while watching other people in distress, people’s patterns of brain activity are quite different depending on whether they are feeling empathy for the distressed person (Decety, 2011). Other studies have identified a relationship between brain development during childhood and people’s later ability to take the perspectives of others (van den Bos et al., 2011). Studies such as these are shedding light on the biological aspects of empathy, and they may eventually lead to a broader understanding of the factors influencing people’s motivation to help each other.

At the same time, social factors can affect biological processes, including the ways our genes express themselves (Cole, 2009). The study of the effects of social environments on gene expression has been called “social genomics” (Slavich & Cole, 2013). This research has shown, for example, that programs that reduce a person’s social stress can affect which of that person’s genes are turned on and off (Antoni et al., 2012). Social factors can also have many health-related biological consequences. As discussed in the chapter on health, stress, and coping, the availability and quality of a person’s social support network can affect biological processes ranging from blood pressure to the healing of wounds (Gouin et al., 2008, 2010; Kiecolt-Glaser, 2009). So the psychological pain of social rejection can appear not only in words (“she broke my heart,” or “he hurt my feelings”) but also in activation of brain regions that normally process physical pain (Eisenberger, 2012). Both marital distress and loneliness can impair the disease-fighting immune system (Cole, 2013; Jarmeka et al., 2013a, 2013b).

In short, social cognitive neuroscience is creating a better understanding of the linkages among social, cognitive, and biological phenomena as well as a better understanding of complex social and physiological processes.

social neuroscience A specialty that focuses on the influence of social processes on biological processes and on the influence of biological processes on social psychological phenomena.

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of social neuroscience illustrates just one way that the topic of this chapter, social psychology, is linked to the subfield of biological psychology, which is discussed in the chapter on biological aspects of psychology. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 16 Social Psychology



LINKAGES

Can we "see" prejudice in the brain?



CHAPTER 3
Biological Aspects
of Psychology

Do groups solve problems more effectively than individuals?



CHAPTER 7
Thought and
Language

How do societies define what is normal?



CHAPTER 14
Psychological
Disorders

SUMMARY

Social cognition, the mental processes through which people perceive and react to others, is one aspect of **social psychology**, the study of how people influence and are influenced by other people. Through social cognition, each person creates a unique perception of reality.

Social Influences on the Self

How do we compare ourselves with others?

People's social and cultural environments affect their thoughts and feelings about themselves, including their **self-concept** and their **self-esteem**. When people have no objective criteria by which to judge themselves, they look to others as the basis for **social comparison**. Such comparison can affect self-evaluation or self-esteem. Categories of people that are regularly used for social comparison are known as **reference groups**.

A person's **social identity** is formed from beliefs about the groups to which the person belongs. Social identity affects the beliefs we hold about ourselves, our self-concept. Social identity

permits people to feel that they are part of a larger group, generating loyalty and sacrifice from group members but also potentially creating bias and social discrimination toward people who are not members of the group.

Social Perception

Do we perceive people and objects in similar ways?

Social perception concerns the processes by which people interpret information about others, form impressions of them, and draw conclusions about the reasons for their behavior. **Schemas**, the knowledge about people and social situations that we carry into social interactions, affect what we pay attention to, what we remember, and how we judge people and events.

First impressions are formed easily and quickly, in part because people apply existing schemas to their perceptions of others. First impressions change slowly because once we form an impression about another person, we try to maintain it. Schemas, however, can create **self-fulfilling prophecies**, leading us to act in

ways that bring out behavior in others that is consistent with our expectations of them.

Attribution is the process of explaining the causes of people's behavior, including our own. Observers tend to attribute behavior to causes that are either internal or external to the actor. Attributions are also affected by biases that systematically distort our view of behavior. The most common attributional biases are the **fundamental attribution error** (and its cousin, the ultimate attribution error), the **actor-observer effect**, and the **self-serving bias**. Personal and cultural factors can affect the extent to which people exhibit these biases.

Attitudes

Do attitudes always determine behavior?

An **attitude** is the tendency to respond positively or negatively to a particular object. Attitudes affect a wide range of behaviors. Most social psychologists see attitudes as composed of three components: cognitive components (beliefs), affective components (feelings), and behavioral components (actions).

Attitudes can be learned through modeling as well as through classical or operant conditioning. They are also subject to the mere-exposure effect: all else being equal, people develop greater liking for a new object the more often they are exposed to it.

The effectiveness of a persuasive message in changing attitudes is influenced by the characteristics of the person who communicates the message, by its content, and by the audience receiving it. The **elaboration likelihood model** suggests that attitude change can occur through either the peripheral or the central route, depending on a person's ability to carefully consider an argument and their motivation to do so. Accordingly, different messages will produce attitude change under different circumstances. Another approach is to change a person's behavior in the hope that attitudes will be adjusted to match the behavior. **Cognitive dissonance theory** holds that if inconsistency between attitude and behavior creates discomfort related to a person's self-concept, the attitude may change in order to reduce the conflict.

Prejudice and Stereotypes

How does prejudice develop?

Stereotypes often lead to **prejudice** and **social discrimination**. Motivational theories of prejudice suggest that some people have a need to dislike people who differ from themselves. This need may stem from the trait of authoritarianism as well as from a strong social identity with one's ingroup. In either case, feeling superior to members of outgroups helps these people feel better about themselves. As a result, ingroup members tend to discriminate against outgroups. Cognitive theories suggest that people categorize others into groups in order to reduce social complexity. Learning theories maintain that stereotypes, prejudice, and discriminatory behaviors can be learned from parents, peers, and the media. The **contact hypothesis** proposes that intergroup contact can reduce prejudice and lead to more favorable attitudes toward the stereotyped group, but only if the contact occurs under specific conditions, such as equal status between groups.

Interpersonal Attraction

What factors affect who likes whom?

Interpersonal attraction is affected by many variables. Physical proximity is important because it allows people to meet. The situation in which they meet is important because positive or negative aspects of the situation tend to be associated with the other person. Characteristics of the other person are also important. Attraction tends to be greater when two people share similar attitudes and personal characteristics. Physical appearance plays a role in attraction; initially, attraction is strongest to those who are most physically attractive. But for long-term relationships, the **matching hypothesis** applies: people tend to choose others whose physical attractiveness is about the same as theirs.

Two key components of successful intimate relationships are interdependence and mutual commitment. Sternberg's triangular theory suggests that love is a function of three components: passion, intimacy, and commitment. Varying combinations of these three components create qualitatively different types of love. Marital satisfaction depends on communication, the perception that the relationship is equitable, the couple's ability to deal effectively with conflict and anger, and agreement on important issues in the marriage.

Social Influence

What social rules shape our behavior?

Social norms establish the rules for what should and should not be done in a particular situation. One particularly powerful norm is reciprocity, the tendency to respond to others as they have acted toward us. **Deindividuation** is a psychological state in which people temporarily lose their individuality, their normal inhibitions are relaxed, and they may perform aggressive or illegal acts that they would not do otherwise.

When behavior or beliefs change as the result of unspoken or implicit group pressure, **conformity** has occurred. When the change is the result of a request, **compliance** has occurred. People tend to follow the normative responses of others, and groups create norms when none already exist. People sometimes display public conformity without private acceptance; at other times, the responses of others have an impact on private beliefs. People conform because they want to be right, because they want to be liked, and because they tend to be rewarded for conformity. People are most likely to conform when the situation is unclear as well as when others in the group are in unanimous agreement. Up to a point, conformity usually increases as the number of people holding the majority view grows larger. Effective strategies for creating compliance include the foot-in-the-door technique, the door-in-the-face procedure, and the lowball approach.

Obedience

How far will people go in obeying authority?

Obedience involves complying with an explicit demand from an authority figure. Research by Milgram indicates that obedience is likely even when obeying an authority appears to result in pain and suffering for another person. Obedience declines when the status of the authority figure declines, when others are observed to disobey, and if a victim asks to be released. Some people are more likely to obey

orders than others. Because participants in Milgram's studies experienced considerable stress, the experiments have been questioned on ethical grounds. Nevertheless, his research showed that people do not have to be psychologically disordered to inflict pain on others.

Aggression

Are people born aggressive?

Aggressive behavior (aggression) is an act intended to harm another person. Freud saw aggression as due partly to instincts. More recent theories attribute aggressive tendencies to genetic and evolutionary factors, brain dysfunctions, and hormonal influences. Learning is also important; people learn to display aggression by watching others and by being rewarded for aggressive behavior. There are wide cultural differences in the occurrence of aggression.

A variety of emotional factors play a role in aggression. The **frustration-aggression hypothesis** suggests that frustration can lead to aggression, particularly in the presence of cues that invite or promote aggression. Arousal from sources unrelated to aggression, such as exercise, can also make aggressive responses more likely, especially if aggression is already a dominant response in that situation. Research in **environmental psychology** suggests that factors such as high temperature and crowding increase the likelihood of aggressive behavior, particularly among people who are already angry.

Altruism and Prosocial Behavior

What motivates people to help one another?

Humans often display **prosocial behavior (helping behavior)** and **altruism**. There are three major theories of why people help others. According to the **arousal: cost-reward theory**, people help in order to reduce the unpleasant arousal they experience when others are in distress. Their specific reaction to a suffering person depends on the costs associated with helping or not helping. Helping is most likely when the need for help is clear and when diffusion of responsibility is not created by the presence of other people—a phenomenon called the **bystander effect**. Environmental and personality factors also affect willingness to help others. The **empathy-altruism helping theory** suggests that helping can be truly unselfish if the

helper feels empathy for the person in need. Finally, evolutionary theory suggests that humans have an innate tendency to help others, especially relatives, because doing so increases the likelihood that family genes will survive.

Cooperation, Competition, and Conflict

What's the best way to help people cooperate?

Cooperation is any type of behavior in which people work together to attain a goal; **competition** exists whenever individuals try to attain a goal while denying others access to that goal. Interpersonal or intergroup **conflict** occurs when one person or group believes that another stands in the way of reaching some goal. Psychologists study conflict by observing behavior in **social dilemmas**, situations in which behavior that benefits individuals in the short run may spell disaster for an entire group in the long run.

Group Processes

What makes a good leader?

People's behavior is affected by the mere presence of other people. By enhancing one's most likely behavior in a situation, the presence of others sometimes creates **social facilitation** (which improves performance) and sometimes creates **social interference** (which impairs performance). When people work in groups, they often exert less effort than when alone, a phenomenon called **social loafing**. Effective group leaders tend to score high on emotional stability, agreeableness, and conscientiousness. In general, they are also intelligent, success oriented, flexible, and confident. **Task-motivated leaders** provide close supervision, lead by giving orders, and generally discourage group discussion. **Relationship-motivated leaders** provide loose supervision, ask for group members' ideas, and are generally concerned with subordinates' feelings. Transactional leaders focus on rewarding or correcting group members' performance, and transformational leaders tend to lead by example, thus inspiring good performance.

A specialty called **social neuroscience** focuses on the influence of social processes on biological processes and on the influence of biological processes on social psychological phenomena.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. Jack was accepted to a top graduate school in social psychology after completing college with honors and having his senior research paper published. As he reads the biographies of Leon Festinger, Theodor Adorno, Elliot Aronson, and other famous social psychologists, he thinks about all of the things each of them accomplished and contrasts that with his own career, which is just beginning. Jack is engaging in _____.
 - a. social facilitation
 - b. social interference
 - c. upward social comparison
 - d. social discrimination

2. One of the assumptions of terror management theory is that _____.
 - a. having high self-esteem helps reduce the impact of thoughts about death
 - b. people who engage in terrorism have antisocial personalities
 - c. it is better to dwell on negative thoughts than to avoid them
 - d. people cope better with terrifying thoughts when they do not seek social support

3. When Rowland first met Jacob, Jacob wasn't feeling well and threw up on Rowland's shoes. According to research on first impressions, we would expect Rowland to _____.
 a. feel sorry for Jacob and thus have a positive first impression of him
 b. develop a negative impression of Jacob because of the negative first experience with him
 c. have an initial negative impression that will become positive later, no matter what Jacob does
 d. have a positive first impression of Jacob because he is a male
4. Gena is in a bad mood because she is convinced that she won't like her blind date, Pat. When Pat arrives, he is outgoing and considerate, but Gena is short-tempered and rude to him. Soon Pat becomes irritable and ends the date early. Gena's prediction that she wouldn't have a good time came true mainly because of _____.
 a. cognitive dissonance
 b. prejudice
 c. a self-fulfilling prophecy
 d. the fundamental attribution error
5. "I earned an A on my history test because I studied hard and I'm smart, but I failed my philosophy test because its questions were poorly worded and the teacher doesn't like me." This statement is an example of _____.
 a. the actor-observer effect
 b. the fundamental attribution error
 c. a self-fulfilling prophecy
 d. a self-serving bias
6. Richard is listening to a student government leader suggest that professors on campus should stop giving grades. Richard is most likely to be convinced if the speaker _____.
 a. introduces a famous celebrity who supports this idea
 b. circulates a petition in support of the idea
 c. presents evidence that eliminating grades will not hurt students' job prospects
 d. is personable and funny
7. Rachel and Matteus listen to a boring lecture. Afterward, Rachel is offered \$100 and Matteus is offered \$1 to tell the lecturer's next class that the lecture was interesting and fun. Both agree to do so. According to cognitive dissonance theory, we would expect real attitude change about the lecture to occur in _____.
 a. Rachel, but not Matteus
 b. Matteus, but not Rachel
 c. both Rachel and Matteus
 d. neither Rachel nor Matteus
8. In an attempt to reduce prejudice between ethnic groups at Lincoln School, the principal asks members of all groups to help build a new playground. Prejudice would be most likely to decrease as a result if _____.
 a. teams from each ethnic group competed to see which could work the fastest
 b. one member of each group was appointed to a committee to lead the project
 c. members of all the groups worked together in teams to complete various parts of the playground
 d. members of each ethnic group wore the same kind of T-shirt
9. Rhona, a pretty woman with conservative political views, has just moved into an apartment building on campus. All else being equal, which neighbor will Rhona probably like the most?
 a. Jill, whose hair color, height, and weight are similar to Rhona's
 b. Shauna, president of the Young Conservatives club
 c. Patrice, president of the Young Liberals club
 d. Yolanda, who comes from Rhona's home town
10. Giorgio and Louisa share their thoughts, hopes, and daily worries. They plan to stay married throughout their lifetime, and they enjoy an active and satisfying sex life. According to Sternberg's theory, Giorgio and Louisa are experiencing _____ love.
 a. consummate
 b. companionate
 c. temporary
 d. romantic
11. When her best friend stopped by with a Christmas gift, Jen was upset because she had nothing to give in return. Jen was uncomfortable because she _____.
 a. experienced deindividuation
 b. engaged in social loafing
 c. made the ultimate attribution error
 d. could not follow the reciprocity norm
12. In Harper Lee's novel *To Kill a Mockingbird*, an angry mob tries to lynch a prisoner. The prisoner's attorney, Atticus Finch, and his young daughter, "Scout," talk to the crowd, calling people by name, and reminding them that they know their families. Soon the mob disperses, no longer a faceless crowd but a group of identifiable individuals. Atticus and Scout disrupted the phenomenon of _____.
 a. diffusion of responsibility
 b. deindividuation
 c. situational ambiguity
 d. social facilitation

- 13.** Shawn's teacher doesn't keep track of her students' performance when they work in groups, so Shawn does not put as much effort into his group project as he does into his individual project. Shawn is exhibiting _____.
a. a self-serving bias
b. social facilitation
c. social loafing
d. diffusion of responsibility
- 14.** Keyonna thought that the play she had just seen was boring, but everyone else seemed to like it. At the closing curtain, the audience gave the actors a standing ovation. Keyonna stood up and applauded too, even though she didn't believe the actors deserved it. Keyonna's behavior in this situation is an example of _____.
a. conformity
b. compliance
c. obedience
d. a self-fulfilling prophecy
- 15.** Colleen knows she should take a day off from work to study for a big exam, but she also knows her boss won't like it. So she first asks for the entire week off. When the boss refuses, she asks for the one day off instead and he agrees. Colleen used the _____ approach to gain her boss's compliance.
a. foot-in-the-door
b. door-in-the-face
c. lowball
d. peripheral
- 16.** Which of the following is not a major factor in determining whether or not a person will obey an order?
a. The status of the authority figure giving the order.
b. The personality characteristics of the person receiving the order.
c. The presence of another person who disobeys the order.
d. The gender of the person given the order.
- 17.** Leonard is upset because he just can't get his new iPhone to work. When his roommate comes home and accidentally knocks over Leonard's glass of lemonade, Leonard becomes abusive, screaming at his roommate and throwing books and pillows at him. This is an example of the _____ theory of aggression.
a. frustration-aggression
b. generalized arousal
c. authoritarian
d. biological
- 18.** While shopping, Lenora falls and breaks her ankle. She is most likely to receive help from a stranger if she _____.
a. is in a quiet area where only a few people saw her fall
b. is in the midst of a large crowd
c. is in a large city
d. doesn't ask for help
- 19.** Which of the following summarizes the evolutionary view of prosocial behavior?
a. People feel good when they help others.
b. People help others in order to improve the chance that some of their genes will survive in future generations.
c. People are motivated to protect others if the costs of helping are outweighed by the benefits.
d. People are helpful because it improves everyone's chances of survival.
- 20.** One of the most important ways to promote cooperation between people is to _____.
a. improve communication
b. improve conflict-relevant communication
c. punish non-conflict relevant communication
d. increase arousal in each person

Industrial and Organizational Psychology



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Preview

If you've ever had a full-time or part-time job, you know that work involves more than just doing certain tasks and collecting a paycheck. Many job-related experiences—including the characteristics of coworkers and supervisors, the nature of the work, and the pleasures and stressors found in the workplace—have significant effects on employees and the organizations that hire them. Understanding the impact of these experiences is just one aspect of the subfield known as *industrial and organizational (I/O) psychology*. In this chapter, we explore this growing subfield by reviewing how I/O psychologists conduct their research and how they apply that research to improve the performance and welfare of workers and the organizations that employ them.

Suppose that you are the manager of a large department store. You want to hire someone to head up the cosmetics department, but you're not sure how to find the best person for the job. How can you attract applicants with the necessary skills? How will you know which of them would be the best choice? Should you rely on interviews with the candidates, or should you also give them some psychological tests? Perhaps you decide to do both, but how do you choose the interview questions and tests? How should you interpret the results? And what happens after you've made your hiring decision? How will you train, motivate, supervise, and reward employees so that they perform at their best and are happy in their work? And how will you determine if your procedures have met your goals? To address problems such as these, many human resources managers and other organizational executives seek the help of *industrial and organizational (I/O) psychologists*. We briefly mentioned I/O psychology in the introductory chapter; here we describe it in more detail, including a summary of what I/O psychologists do and some of the ways their work has benefited organizations and employees.

AN OVERVIEW OF INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY

What do industrial and organizational psychologists do?

Psychology is the science of behavior and mental processes. The subfield of **industrial and organizational (I/O) psychology** is the science of behavior and mental processes in workplace settings. I/O psychologists conduct scientific research on all sorts of people-oriented workplace topics, such as what personality traits predict good performance under stress, what social factors cause conflict in work groups, and how people feel about the organizations in which they work. I/O psychologists are also hands-on practitioners who help organizations apply research findings to problems such as matching employees to jobs and improving cooperation in workplace teams. The link between scientific research and professional practice can be especially strong in I/O psychology, because the workplace provides both a natural laboratory for studying psychological questions and a setting in which research-based answers can be applied and evaluated.

I/O psychologists address two main goals in their research and practice. First, they *promote effective job performance* by employees and thus create better performance by the organization as a whole. Second, they contribute to human welfare by *improving the health, safety, and well-being of employees*. This second goal is important by itself, but it is also related to the first one. Effective organizations are those whose employees are not only capable of performing their jobs well but are also healthy and well adjusted in the workplace.

industrial and organizational (I/O) psychology The science of behavior and mental processes in the workplace.

Entering I/O Psychology

Some graduates pursue careers in I/O psychology after completing a master's degree program, but salaries and opportunities are better for those with a Ph.D. For example, virtually all I/O psychologists who are hired as college or university professors have completed a doctoral degree. Master's or doctoral training in I/O psychology is available at more than 100 universities in the United States, about 10 in Canada, and more than 80 in other countries.

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I/O psychology emerged early in the 1900s as psychologists began to apply laboratory findings about topics such as learning, memory, and motivation to solve practical problems in the workplace. In fact, some of the first I/O psychologists studied under experimental psychologists. For example, Hugo Münsterberg and James McKeen Cattell, both widely considered as instrumental in the founding of I/O psychology, studied under Wilhelm Wundt in Germany. Elsie Oschrin Bregman, a pioneer in the study of employment testing, was a student of Edward L. Thorndike at Columbia University (Katzell & Austin, 1992; Koppes, 1997; Landy, 1992). Research and applications in I/O psychology continue to be influenced by laboratory research in many of psychology's subfields, including cognitive psychology, personality, motivation and emotion, health psychology, and especially social psychology. And many I/O psychologists study work-related behavior in the laboratory as well as in the workplace (Parasuraman, 2011). The work of I/O psychologists is also shaped by findings in fields beyond psychology, including business management, marketing, economics, engineering, statistical theory, and medicine.

Like psychologists in other subfields, I/O psychologists hold graduate degrees in their specialty. The popularity of I/O psychology has grown rapidly in recent decades, both in North America and throughout the industrialized world (Spector, 2003). About 53 percent of I/O psychologists work in the private sector. Another 34 percent are professors in college or university departments of psychology, business, or related fields. About 8 percent are research scientists in the public sector, including in government agencies, and about 5 percent work in non-profit companies (Khanna & Medsker, 2013). Let's consider some of the specific kinds of work that I/O psychologists do in these various settings.

ASSESSING PEOPLE, JOBS, AND JOB PERFORMANCE

How do industrial and organizational psychologists match employees to jobs?

If you apply for a job with a large corporation or government agency, you will probably be given one or more standardized tests of mental ability or personality, as well as assessments of your knowledge and skills to help determine whether you have the "right stuff" for the job you seek. These assessment programs are usually designed by I/O psychologists. In fact, the most typical request that I/O psychologists receive from organizations is to develop or conduct some sort of assessment procedure. Accordingly, the creation and

evaluation of new and better assessment devices is one of the main areas for scientific research in I/O psychology. This kind of work aligns I/O psychology closely with the field of psychological measurement, or *psychometrics*, so the two subfields have long overlapped.

Knowledge, Skills, Abilities, and Other Characteristics

Industrial and organizational assessments are often used to describe the human attributes necessary for doing jobs successfully. Those attributes are referred to collectively as KSAOs, which stands for *knowledge, skill, ability, and other personal characteristics*. *Knowledge* refers to what a person knows. *Skill* refers to how good a person is at doing a particular task. *Ability* is defined as a person's more general capacities in areas such as thinking, physical coordination, or interpersonal functioning. Skills and abilities are closely related; some researchers consider skills to be the products of inherent abilities (Muchinsky, 2003). *Other personal characteristics* can be almost anything else about a person, including attitudes, personality traits, physical characteristics, preferences, or values.

Job Analysis

How do organizations know which KSAOs are important for which jobs? The answer lies in **job analysis**, in which I/O psychologists collect information about particular jobs and job requirements. This job-analysis information is then used to guide decisions about whom to hire and what kind of training is needed to succeed at a particular job (Brannick & Levine, 2002). There are two major approaches to job analysis. The *job-oriented approach* describes the tasks involved in doing a job, such as wiring circuit boards, creating a computer database, or driving a truck. In organizations that emphasize teamwork, the job-oriented approach to job analysis might also include asking each team member to describe their coworkers' tasks as well as their own (Brannick, Levine, & Morgeson, 2007). The *person-oriented approach* describes the KSAOs needed to do those job tasks (see Table 17.1).

Some job analyses take one approach or the other, but many provide information about both tasks and KSAOs. A job-analysis report can be a relatively brief and superficial description, a microscopically detailed examination, or anything in between. The approach taken and the level of detail included in a job analysis depend mainly on how the report will be used. When the analysis will guide the hiring of employees, it should contain enough detail to make clear what needs to be done in a particular job. Having these details spelled out also helps the organization establish and maintain fair hiring practices. The person-oriented approach is the most useful one for these purposes, because it describes the KSAOs the employer should be looking for in the new employee.

TABLE 17.1 KNOWLEDGE, SKILL, ABILITY, AND OTHER PERSONAL CHARACTERISTICS (KSAOs)

Here are examples of the kinds of KSAOs required for successful performance by people working in two different jobs. Just for fun, try writing KSAOs for your job as a student and for your teacher's job, too.

Job Title	Knowledge	Skill	Ability	Other
Secretary	Knowledge of office procedures	Skill in using a word-processing program	Ability to communicate with others	Willingness to follow instructions
Plumber	Knowledge of county building codes	Skill in using a wrench	Good hand-eye coordination	Willingness to work in dirty environments

job analysis The process of collecting information about jobs and job requirements that is used to guide hiring and training decisions.

Job analysis can also help organizations recognize the need to train employees, and it can help establish the kind of training required. Suppose you have five job openings, but when you test candidates for hiring or promotion, too few of them have the KSAOs that a job analysis says are necessary for success in these positions. Obviously, some training will be needed, and because the job analysis lists specific KSAOs, you can use that analysis to determine exactly what the training should include. Suppose a job analysis reveals that people in a particular computer sales position have to be familiar with the Linux operating system. You would need to provide Linux training for all individuals hired for that position unless they already knew that operating system.

Questionnaires that ask current employees to describe their jobs are the most common tool for job analysis. Other methods include assigning specially trained job analysts to observe people as they do their jobs or even to perform those jobs themselves (Dierdorff & Wilson, 2003). If the goals of job analysis include comparing one job with another, I/O psychologists might use an instrument such as the *Position Analysis Questionnaire*, or PAQ (McCormick, Jeanneret, & Mecham, 1972). The 189 items on the PAQ can describe almost any job in terms of a particular set of characteristics, or dimensions, such as the degree to which a job involves communicating with people, lifting heavy objects, or doing mental arithmetic. The results of thousands of job analyses have been collected in the U.S. Department of Labor's Occupational Information Network, or O*NET (Peterson et al., 2001). This computer database contains analyses of approximately 1,100 groups of jobs, including the KSAOs and tasks involved in each, and how each job fits into the larger organizational picture. O*NET is an excellent source of information about occupations for anyone who is in the process of choosing a career, and you can access it online.

Measuring Employee Characteristics

LINKAGES What methods are used to select good employees? (a link to Personality)

I/O psychologists use many instruments to measure a person's knowledge, skill, ability, and other characteristics. These instruments range from simple paper-and-pencil tests (an arithmetic test for a sales clerk, for example) to several days of hands-on activities that simulate the tasks required of a midlevel manager. Some assessments are used to select new employees, others are designed to choose employees for promotion, and still others are meant to determine how well employees are doing their jobs at the moment. The three main methods used to measure employee characteristics are psychological tests, "structured" job applicant interviews, and assessment center exercises.

Psychological Tests

The tests that I/O psychologists most often use to measure general mental ability and skill are the standard intelligence tests described in the chapter on intelligence. These tests are relatively inexpensive and easy to administer, and they do a reasonably good job at predicting people's performance in a wide variety of occupational tasks (e.g., Jansen & Vinkenburg, 2006; Kuncel & Hezlett, 2010; Rooy et al., 2006). In addition, job applicants might take *situational judgment tests* (SJT_s), in which they read about or watch videos of simulated workplace situations, such as a conflict between coworkers, then rate which of several responses would be best or describe what they would do in a similar situation (Sackett & Lievens, 2008). Information provided by SJTs supplements cognitive and personality tests and provides an additional perspective from which to predict an applicant's eventual job performance (Lievens, Peeters, & Schollaert, 2008). Tests of job-relevant knowledge—such as basic accounting principles or stock-trading rules—may also be used to confirm that an individual is familiar with the procedures and other information necessary to do well at a particular job.

Finally, personality tests measure a variety of other employee characteristics. As described in the personality chapter, some such tests provide information about personality dimensions that may be relevant to hiring decisions. For example, a person's score on *conscientiousness* (i.e., reliability and industriousness) has been linked to job performance



A Matter of Degree

When hiring employees for some jobs, organizations often rely on credentials rather than knowledge tests. For example, an undergraduate degree in any major may be enough to qualify for some white-collar jobs because people assume that college graduates have enough general knowledge and "mental horsepower" to succeed. For jobs in medicine, law, accounting, engineering, and other specialty fields, candidates' knowledge is assumed if they have completed a particular degree program or earned a particular license. These assumptions are usually correct, but credentials alone do not always guarantee competence.

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assessment center An extensive set of exercises designed to determine an individual's suitability for a particular job.

across many occupations (Dudley et al., 2006; Thoreson et al., 2003). You might assume that more conscientious workers display better job performance, but I/O psychologists have found that this is true only up to a point. It turns out that employees who are either the least conscientious *or* who are overly conscientious tend not to perform as well as workers whose conscientiousness is high but not extreme. This "too much of a good thing" effect (Carter et al., 2013; Pierce & Aguinis, 2013) has also appeared in relation to extraversion (Grant, 2013). Some employers also use personality-related *integrity tests*, which ask about moral values, tendencies, temptations, and history that might make employees more likely to steal or engage in other disruptive acts (e.g., Berry, Sackett, & Wiemann, 2007; Wanek, Sackett, & Ones, 2003). Unfortunately, it is relatively easy to give false or misleading responses on these tests, and there is evidence that applicants may do so (van Hooft & Born, 2012; Zickar, Gibby, & Robie, 2004).

Job Applicant Interviews

Job applicant interviews are intended to determine a job applicant's suitability for a job. They tend to be preferred by both employers and employees (Hausknecht, Day, & Thomas, 2004). Interviews usually take place in person, though some are conducted by telephone, videoconferencing, or e-mail. As discussed in the personality chapter, interviews can be structured or unstructured (open ended). In a *structured interview*, the interviewer prepares a list of specific topics or even specifically worded questions to be covered in a particular order (Campion, Palmer, & Campion, 1997; Chapman & Zweig, 2005). In *unstructured interviews*, the course of a conversation is more spontaneous and variable. Following some interviews, especially structured ones, the candidate's responses will be rated on a set of dimensions, such as product knowledge, clarity of expression, or poise. After other interviews, the interviewer's subjective impression of the candidate is used to make a yes-or-no judgment about the candidate's suitability for the job.

Research consistently shows that structured interviews are far more effective than unstructured interviews in leading to good hiring decisions (e.g., Huffcutt & Arthur, 1994; Wiesner & Cronshaw, 1988). The difference is due largely to the fact that structured interviews focus specifically on job-related knowledge and skills—especially interpersonal skills—whereas unstructured interviews do not (Huffcutt et al., 2001). Further, lack of structure makes it easier for personal bias, observational errors, and misinterpretations to enter the hiring picture; ratings from an unstructured interview might have more to do with the interviewer's personal bias about a candidate than with the candidate's objective qualifications. Finally, lack of structure can also create unfairness because different candidates might not necessarily be asked the same set of questions or be given the same chance to "show their stuff."

Assessment Centers

An **assessment center** is an extensive set of exercises designed to determine an individual's suitability for a particular job. Performance is usually judged by a team of raters (Spychalski et al., 1997). Assessment centers are often used to hire or promote managers, but they can be employed in relation to other positions as well. A typical assessment center consists of two to three days of exercises that simulate various aspects of a job. The *in-basket test* is a typical assessment center exercise for managers. Candidates are seated at a desk and asked to imagine that they have just taken over a new management job. On the desk is the "previous manager's" overflowing in-basket, containing correspondence, memos, phone messages, and other items. The candidate's task is to go through all this material and write on the back of each item what action should be taken to deal with it and how soon. Later, experts read what the candidate has written and assign an appropriateness score to each action. For example, candidates who prioritize tasks well—taking immediate action on critical matters and delaying action on less-important ones—would receive higher scores than those who, say, deal with each task in the order in which it is encountered, regardless of its importance.

Other assessment center exercises measure interpersonal skills. The job candidate might be asked to play the role of a manager who is working with others to solve a problem or who must discipline a problem employee. As in the in-basket test, each candidate is given a score on the knowledge, skills, abilities, and other job-relevant characteristics displayed during each exercise.

The evaluation team reviews and discusses the candidate's total score on the assessment center exercises and reaches a group decision about the person's suitability for a particular position. Research shows that assessment centers work well. For example, the assessment center scores earned by first-year college students predict their performance as teachers several years after graduation (Shechtman, 1992). Assessment centers also predict the performance of police officers, pilots, and managers, among others (Dayan, Kasten, & Fox, 2002; Lievens et al., 2003; McEvoy & Beatty, 1989). However, assessment centers can be expensive and time-consuming. Further, performance scores on assessment centers correlate relatively strongly with applicants' performance on interviews and cognitive tests. With these factors in mind, some researchers suggest using assessment centers only as a second step in the selection process, and only for applicants whose interview and test scores are neither high enough nor low enough to guide a final hiring decision (Dayan, Fox, & Kasten, 2008).

Measuring Job Performance

Almost all employees of medium to large organizations receive an annual **job performance** appraisal, which, much like a student's report card, provides an evaluation of how well they are doing in various aspects of their work. Organizations use these appraisals to guide decisions about salary raises and bonuses for employees and about whether to keep, promote, or fire particular individuals. The appraisals are also used to give employees feedback on the quality and quantity of their work (Rynes, Gerhart, & Parks, 2005). This feedback function of job performance appraisals is important because it helps employees recognize what they are doing right and what they need to do differently to reach their own goals and promote the goals of the organization.

Establishing Performance Criteria

One of the most important roles for I/O psychologists in designing job performance appraisal systems is to help establish *criteria*, or benchmarks, that define what the organization means by "good" or "poor" performance (see Table 17.2). These criteria can be theoretical or actual. A *theoretical criterion* is a statement of what we mean by good (or poor) performance, in theory. A theoretical criterion for good teaching, for example, might be "promotes student learning." This criterion certainly sounds reasonable, but notice that it does not specify how we would measure it in order to decide whether a particular teacher is actually promoting student learning. So we also need an *actual criterion*, which specifies what we should measure to determine whether the theoretical criterion has been met. An actual criterion for good teaching might be defined in terms of students' performance on a standardized test of what their teacher has taught them. If, on average, the students reach or exceed some particular score, the teacher will have satisfied one of the school district's criteria for good teaching.

Keep in mind, though, that the match between theoretical criteria and actual criteria is never perfect. The actual criterion chosen should provide a sensible way to assess the theoretical criterion, but the actual criterion may be flawed. For one thing, actual criteria are usually incomplete. There is more to good teaching than just ensuring that students earn a particular score on a particular test. The teacher may have done a great (or poor) job at teaching material that did not happen to be covered on that test. Second, the actual criterion can be affected by factors other than the employee's performance. Perhaps students' scores on a standardized test were affected partly by the work of a good (or poor) teacher they had before their current teacher was hired. I/O psychologists are sensitive to these problems, and they usually recommend basing job performance appraisals on several actual criteria, not just one.

job performance A measure of how well employees are doing in various aspects of their work, usually recorded in an annual appraisal.

TRY THIS**TABLE 17.2 EXAMPLES OF THEORETICAL AND ACTUAL CRITERIA**

Here are some theoretical and actual criteria for several kinds of jobs. Notice that theoretical criteria tend to be rather vague, so for purposes of job performance appraisals, they must be backed up by actual criteria. By evaluating employees on how well they have reached actual criteria, organizations can decide whether the theoretical criteria have been met, and they can act accordingly. Think about the kinds of jobs you have had in your life or that you might like to have, and try to develop your own set of fair, appropriate theoretical and actual criteria for performance in these jobs.

Job	Theoretical Criterion	Actual Criterion
Architect	Design buildings	Number of buildings designed
Car salesperson	Sell cars	Number of cars sold per month
Police officer	Fight crime	Number of arrests made per month
Roofer	Install roofs	Square feet of shingles installed per month
Scientist	Make scientific discoveries	Number of articles published in scholarly journals

I/O psychologists also distinguish between different *types* of performance. They focus in particular on three basic dimensions of performance. The first of these, *task performance*, is what we generally think of when we hear the phrase “job performance” and refers to how well employees complete their job-related tasks and handle their duties and responsibilities. The second dimension, *organizational citizenship behaviors (OCBs)*, are “extra-role behaviors,” which includes things like chipping in to help a coworker meet a crucial deadline. The third dimension, *counterproductive work behaviors (CWBS)*, are negative behaviors that harm the organization; these can range from stealing office supplies to sabotaging other workers’ performance. Most supervisors tend to emphasize task performance and CWBS, but OCBs are also an important component of performance in organizations (Rotundo & Sackett, 2002).

Methods of Performance Appraisal

The information used in job performance appraisals can come from objective measures and subjective measures.

Objective Measures

Objective measures of job performance include counting the frequency of certain behaviors or the results of those behaviors. The number of calls made by a telemarketer, the number of computers shipped out by a factory worker, and the total value of items sold each month by a shoe store employee are examples of objective measures of job performance. Objective measures of problematic behaviors might include the number of days employees are absent, how often they arrive late, or the number of complaints filed against them (Roth, Huffcutt, & Bobko, 2003). Objective appraisal measures may be especially valuable because they can link theoretical criteria with actual performance criteria. If the theoretical criterion for good performance as a salesperson is to sell a company’s products, the most closely linked actual criterion would be an objective count of the number of those products sold per month.

Objective methods of job performance are not right for all jobs, however, because some performance criteria cannot be evaluated by counting things. For example, it would make no sense to evaluate a teacher's job performance by counting the number of students taught per year. Teachers usually have no control over their class size, and in any case, an enrollment count tells us nothing about what the students learned. Similarly, a salesperson might have sold twenty cars last month, but it would also be important to know how this was accomplished. If the person used unethical or high-pressure tactics that angered customers and harmed the organization's reputation, the sales count tells only part of the story of this employee's performance. In other words, except for the simplest jobs, objective measures may fail to assess all the aspects of performance that are of interest to an organization.

Subjective Measures

I/O psychologists sometimes recommend that objective performance measures be supplemented or sometimes even replaced by subjective measures. *Subjective measures* of job performance tend to focus on a supervisor's judgments about various aspects of an employee's work (Rynes, Gerhart, & Parks, 2005). Typically, the supervisor records these judgments on a graphic rating form or a behavior-focused rating form.

Graphic rating forms list several criterion-related dimensions of job performance and provide a space for the supervisor to rate each employee's performance on each dimension, using a scale ranging from, say, 1 to 10 or from *poor* to *excellent* (see Figure 17.1). These graphic ratings can be valuable, but they reflect the supervisor's subjective judgment. So, as in unstructured interviews, factors other than the employee's performance can influence the results (Peretz & Fried, 2012; Wong & Kwong, 2005). For example, most graphic ratings reflect *leniency error*, meaning that supervisors tend to use only the top of the scale. As a result, most employees in most organizations receive ratings of "satisfactory" or better. Many supervisors also show errors based on a *halo effect*, meaning that they tend to give the same rating on every dimension of job performance. So if Tasha receives an "outstanding" rating on one dimension, such as promptness, she will probably be rated at or near "outstanding" on all the others. Similarly, if Jack is rated as only

FIGURE 17.1

A Graphic Rating Form Used in Subjective Job Performance Appraisal

Supervisors often use graphic rating forms like this one in subjective job performance appraisals. The ratings are based on the supervisor's personal experience with the employee and on subjective impressions of that employee's work.

Rate employee on each dimension on the left by checking the appropriate box corresponding to the level of performance for the past year.					
Dimension					
Customer service	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Above satisfactory	<input type="checkbox"/> Outstanding
Management of time	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Above satisfactory	<input type="checkbox"/> Outstanding
Professional appearance	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Above satisfactory	<input type="checkbox"/> Outstanding
Teamwork	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Above satisfactory	<input type="checkbox"/> Outstanding
Work quality	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Above satisfactory	<input type="checkbox"/> Outstanding
Work quantity	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Above satisfactory	<input type="checkbox"/> Outstanding

“satisfactory” on one scale, such as product knowledge, he will probably get “satisfactory” ratings on the rest of them.

To some extent, these rating tendencies may just reflect reality. After all, most people try to do their jobs well and may do about equally well (or equally poorly) in various aspects of their work (Balzer & Sulskey, 1992; Solomonson & Lance, 1997). However, when using graphic rating forms, supervisors may not carefully discriminate between those aspects of job performance that are satisfactory from those that need improvement. Further, many tend to “go easy” on their employees, especially if they like them, if they want to curry favor with them for some reason, or if they want to appear “politically correct” (Harber et al., 2012; Judge & Cable, 2011). Such bias can result in favoritism in which supervisors inflate ratings beyond what an employee’s performance deserves (Rynes, Gerhart, & Parks, 2005). Supervisors who are biased against certain employees based on gender, ethnicity, or other factors may give those employees undeservedly low ratings (Heilman & Haynes, 2008; Stauffer & Buckley, 2005).

To help minimize the errors and bias associated with graphic rating forms, I/O psychologists developed *behavior-focused rating forms*, which ask supervisors to rate employees on specific actions rather than on general overviews of performance (Smith & Kendall, 1963). These forms contain lists of *critical incidents* that illustrate different levels of performance—from “extremely effective” to “extremely ineffective”—on important job dimensions (Flanagan, 1954). A critical incident list relating to customer relations, for example, might include “listens patiently,” “tries to reach a compromise,” “coldly states store policy,” and “angrily demands that complaining customers leave.” Once these behavior-focused forms are constructed, supervisors choose which incidents are most typical of each employee.

Behavior-based rating forms help supervisors and their employees come to a better understanding of what is meant by “good” and “poor” performance. However, these forms don’t appear to eliminate the impact of supervisor bias and error (Bernardin & Beatty, 1984; Latham et al., 1993). Accordingly, some employers assess employees’ job performance on the basis of ratings by peers and subordinates as well as supervisors. These “360-degree” ratings are designed to provide a broader and potentially less biased picture of an employee’s performance (Oh & Berry, 2009). (See “In Review: Assessing People, Jobs, and Job Performance” for a summary of these topics.)

IN REVIEW

ASSESSING PEOPLE, JOBS, AND JOB PERFORMANCE

Target of Assessment	Typical Purpose	What Is Assessed	Examples
Employees	Employee selection	Knowledge, skill, ability, and other personal characteristics (KSAOs)	Tests of ability, achievement, or personality; structured or unstructured interviews; assessment centers requiring simulated job tasks
Jobs	Matching employees to jobs; identifying training needs	Job tasks and personal attributes needed for the job	Job-oriented analysis (identifies required tasks); person-oriented analysis (identifies KSAOs required for success)

(continued)

IN REVIEW

ASSESSING PEOPLE, JOBS, AND
JOB PERFORMANCE (CONT.)

Target of Assessment	Typical Purpose	What Is Assessed	Examples
Job performance	Feedback on performance; decisions about retention, salary adjustments, or promotion	Work activities and/or products; supervisors' reports	Evaluating employees' work in relation to theoretical and actual criteria as measured by objective (counting) or subjective (rating) methods

In Review Questions

1. Lists of critical incidents are contained in _____-focused employee rating forms.
2. A potential employer might use a two-day _____ to measure your skill at the job you want.
3. In general, _____ interviews are more useful in employee selection than _____ interviews.

RECRUITING AND SELECTING EMPLOYEES

How do organizations find good employees?

So far, we've described some of the assessment methods that I/O psychologists have developed to help organizations hire, train, and evaluate employees. Let's now consider the role of I/O psychology in finding candidates for employment and in selecting the right people for each job.

Recruitment Processes

People are usually an organization's most valuable assets because people are ultimately responsible for achieving an organization's goals. So it is no wonder that there is intense competition among organizations to recruit the "best and brightest" employees. It is a disciplined competition, however. There is no point in hiring this year's top ten accounting graduates if your organization needs only two new accountants. So the first step in effective recruiting is to determine what employees are needed and then go after the best people to fill those needs.

Determining employment needs means more than just counting empty chairs, though. Analyses by I/O psychologists help organizations determine how many people are needed in each position at the moment and how many will be needed in the future. Suppose, for example, that a computer company anticipates a 20 percent growth in business over the next five years. That growth will require a 20 percent increase in the number of customer service representatives, but how many new representatives should be hired each month? An I/O psychologist's analysis would help answer this question by taking into account not only the growth projections but also estimates of how many representatives quit their jobs each year and whether the existing ratio of customer service employees to customers is too high, too low, or just about right for efficient operation. In making recommendations about recruitment plans, I/O psychologists must also consider the intensity of demand for employees in various occupations. More active recruitment plans will be necessary to attract the best people in high-demand areas (see Table 17.3).

TABLE 17.3 FAST-GROWING OCCUPATIONS

Here are the ten fastest growing occupations listed in the U.S. Bureau of Labor Statistics *Occupational Outlook Handbook* (U.S. Bureau of Labor Statistics, 2014). I/O psychologists must take such trends into account when making recommendations about where to make the strongest efforts at recruiting new employees. More information about these job categories is available on the Bureau of Labor Statistics website.

Occupation	Percent Employment Change, 2012–2022
Industrial/Organizational psychologists	53
Personal and home care aides	49
Home health aides	48
Insulation workers, mechanical	47
Interpreters and translators	46
Diagnostic medical sonographers	46
Helpers—brickmasons, blockmasons, stonemasons, and tile and marble setters	43
Occupational therapy assistants	43
Genetic counselors	41
Physical therapist assistants	41

Once employment needs are established and the competitive landscape has been explored, the next step in recruitment is to persuade people with the right kinds of knowledge, skills, ability, and other characteristics to apply for the jobs to be filled. Common methods for identifying and attracting candidates include posting jobs on recruitment websites; newspaper advertising; interviewing graduating seniors on college campuses; seeking referrals from current employees; working with employment agencies, recruitment consultants, and private “head-hunting” firms; and accepting walk-in applications from job seekers who appear on their own. The recruitment methods used for any particular job will depend on how easy or difficult it is to attract high-quality applicants and on the importance of the position in the organization. For relatively low-level positions requiring few skills, it may be possible to rely on walk-in applicants to fill available positions. Much more effort and several different recruitment methods may be required in order to attract top-notch candidates for higher-level jobs that demand extensive experience and skill.

Selection Processes

Selecting the right employee for a particular job is generally a matter of using the results of tests, interviews, and assessment centers to find the best fit between each candidate's characteristics and the tasks and characteristics that a job analysis has identified as necessary for successful performance. This matching strategy would suggest that a candidate who is better at written communication than at computer skills would do better in, say, the public relations department than at the computer help desk.

Is this strategy the best way to select employees? Usually, but one job of I/O psychologists is to learn if the characteristics that are supposed to predict success at particular jobs are, in fact, associated with success. To do so, they conduct *validity studies*, which are research projects that analyze how well a particular test, interview, or other assessment method predicts employees' actual job performance (Chan, 2005). For example, on the basis of a job analysis conducted years ago, a department store might require applicants for sales clerk positions to pass a test of mental arithmetic. A validity study could determine whether performance on that test is actually related to sales clerks' performance. The easiest way to conduct this study would be to ask a representative sample of the store's sales clerks to take the arithmetic test, then compute the correlation between their test scores and some objective or subjective performance criterion, such as monthly sales figures or a supervisor's ratings. If those who score highest on the test also do best at their job, the arithmetic test can be seen as valid for predicting job performance. If not, it may be that for clerks using today's computerized sales terminals, mental arithmetic is no longer as important to job success as it was in the past.

A large body of results from I/O psychology research is available to tell organizations which types of tests and other assessments are most valid in predicting performance in which types of jobs. These results save organizations a great deal of time and money because they eliminate the need to conduct their own validity studies for each assessment device they use in selecting employees for every job they want to fill.

Legal Issues in Recruitment and Selection

The United States and many other countries have laws requiring that an organization's hiring, firing, and promotion processes should not discriminate against anyone based on characteristics that have nothing to do with job performance. Such laws are intended to protect all employees and job candidates against unfair discrimination. U.S. laws—including the Civil Rights Act, the Americans with Disabilities Act, and the Age Discrimination in Employment Act—have also created special safeguards for several *protected classes*, including women, Asians, Blacks, Hispanics, American Indians, and other groups. Together, these laws make it illegal for employers in the United States to discriminate in hiring or promotion on the basis of a candidate's age, ethnicity, gender, national origin, disability, or religion. Many states, cities, and counties—and some other countries, such as Canada, Spain, and Denmark—also prohibit discrimination based on sexual orientation.

In 1978, I/O psychologists helped the U.S. government create its *Uniform Guidelines on Employee Selection Procedures*, a document that outlines the procedures organizations must use to ensure fairness in hiring and promotion. The most important element of these guidelines is the requirement that personnel decisions be based solely on job-related criteria. This means that in choosing new employees, for example, organizations should hire people whose knowledge, skill, ability, and other characteristics match the KSAO requirements previously established by the job-analysis process described earlier. The guidelines also state that organizations should use only test scores and other assessment data that validation studies have established as good predictors of job performance.

TRAINING EMPLOYEES

What kind of training do employees need?

Every year, organizations in the industrialized world spend billions on training their employees (Thompson et al., 2002); in the United States alone, the figure is more than \$126 billion each year (Paradise, 2007). I/O psychologists are directly involved in establishing the need for training, designing training methods and content, and evaluating the outcome of training efforts (Salas et al., 2012). Some I/O psychologists actually conduct training programs, but in most cases these programs are delivered by professional trainers and/or experts on the training topics involved.

Ensuring Equal Opportunity

Affirmative Action (AA) is an important element of the U.S. government's *Uniform Guidelines on Employee Selection Procedures*. A major goal of AA was to encourage organizations to actively seek out job applicants from underrepresented minority groups and in the process ensure that qualified minority candidates are not overlooked. Critics claim, though, that AA establishes quota systems in which certain percentages of people from particular groups must be hired or promoted even if they are not all well qualified. AA has thus become a controversial aspect of employment law.

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Assessing Training Needs

To help organizations identify which employees need what kind of training, I/O psychologists typically carry out a *training needs assessment* that takes into account the organization's job categories, work force, and goals (Blanchard & Thacker, 2007; Goldstein, 1993; Salas et al., 2012). One aspect of this assessment involves looking at job-analysis reports. As mentioned earlier, the need for training is indicated when job analyses reveal that certain jobs require knowledge, skills, or abilities that employees do not have or that should be strengthened. A second aspect of a training needs assessment is to give employees a chance to describe the training they would like to have. This information often emerges from *personal development plans* created by employees and their supervisors. These plans usually include an evaluation of the person's strengths and weaknesses. The weaknesses identified suggest where training might be useful, especially for employees who are motivated to improve their skills (Klein, Noe, & Wang, 2006). For example, if the supervisor notes that an individual is awkward when making presentations, a course in public speaking might be worthwhile. Finally, I/O psychologists will look at the goals of the organization. If those goals include reducing workplace accidents or improving communication with international customers, then training in safety procedures or foreign-language skills would be in order.

Designing Training Programs

In designing organizational training programs, I/O psychologists are mindful of the basic principles that govern the learning and remembering of new information and skills. These principles, which are described in the learning and memory chapters, guide efforts to promote *transfer of training*, *feedback*, *training in general principles*, *overlearning*, and *sequencing*.

Transfer of Training

The most valuable training programs teach knowledge and skills that generalize, or transfer, to the workplace. If employees don't apply what they learn to improve job performance, then training efforts will have been wasted. Because promoting *transfer of training* is not always easy, I/O psychologists develop written materials and active learning exercises that both clarify the link between training and application and give employees experience at



Staying Goofy

Training programs for employees who portray cartoon characters at major theme parks emphasize the general principle that the organization's goal is to create a fantasy world for customers. This aspect of training helps the employees understand why it is important to follow the rule of remaining in character at all times. A carefully cultivated fantasy world would be disrupted if children were to see "Mickey Mouse" or "Bugs Bunny" holding his headgear under his arm while smoking a cigarette!

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applying new knowledge and skills in simulated work situations. So trainees might first complete reading assignments, attend lectures, and watch videos illustrating effective approaches to dealing with customer complaints or defusing an office conflict. Then they might form groups to role-play using these approaches in a variety of typical workplace scenarios. These experiences enhance transfer of training, especially when the trainees' newly learned skills are supported and rewarded by their coworkers and supervisors (Kontoghiorghes, 2004).

Feedback

People learn new skills faster when they receive *feedback* on performance (Smither, London, & Reilly, 2005). In organizational training, this feedback usually comes from the trainer and/or other trainees. It takes the form of positive reinforcement following progress, constructive suggestions following errors or failure, and constant encouragement to continue the effort to learn. For example, after one trainee has role-played a new way to deal with an irate customer or a disgruntled employee, the trainer might play a videotape of the effort so that everyone can offer comments, compliments, and suggestions for improvement.

Training in General Principles

People tend to learn better and remember more of what they learn when they can see new information in a broader context—in other words, when they have some insight into how the information or skill they are learning fits into a bigger picture (Baldwin & Ford, 1988). We specifically designed the Linkages sections in this book to promote this kind of learning. In organizational settings, the "big picture" approach takes the form of *training in general principles*, which teaches not only how to do things in particular ways but also why it is important to do so. When training new customer service agents at a hotel, a bank, or an airline, for example, trainers often provide an orientation to the basic characteristics of these businesses, including how competitive they are. Understanding their company's need to survive intense competition will help employees recognize the importance of courtesy training in determining whether a customer remains a customer or goes elsewhere.

Overlearning

Practice makes perfect in all kinds of teaching and training. I/O psychologists emphasize the need for employees to practice using the information and skills learned in a training program until they reach a high level of performance. In fact, many training programs encourage employees to continue practicing until they are not only highly competent but are also able to perform the skill or use the information automatically without having to think much about it. This *overlearning* is seen in many everyday situations, most notably among experienced drivers, who can easily get from one place to another without paying much attention to the mechanics of steering, braking, and turning. Athletes and musicians, too, practice until their skills seem to unfold on their own. In the workplace, overlearning can save time and improve efficiency. For example, members of an experienced medical team can perform surgery using skills and information that, through overlearning, have become second nature to them. They do not have to stop and think about how critical tasks must be done; they simply do them (Driskell, Willis, & Copper, 1992).

Sequencing

Is it better to cram organizational training into one or two long, intense sessions over a single weekend or to schedule it in several shorter sessions over a longer period of time? Intense, *massed training* is certainly less expensive and less disruptive to employees' work schedules than *distributed training*. However, as described in the memory chapter, we know that people don't retain as much after massed practice ("cramming") as they do after distributed practice (Bjork, 1999; Donovan & Radosevich, 1999). Among other problems, massed training, like massed practice, can create boredom, inattention, and fatigue, all of which interfere with the learning and retention of new material. As most students can

appreciate, an employee might remain motivated and interested during a one-hour training session but will probably be exhausted and inattentive by the end of an eight-hour training marathon. With this in mind, organizational training programs are set up using a distributed schedule whenever possible.

Evaluating Training Programs

Did a training program produce enough benefits to the organization to make it worth the time and money it cost? Should it be repeated? If so, should it be refined in some way? I/O psychologists conduct research on these important evaluation questions (Salas et al., 2012). As described in the introductory chapter, controlled experiments offer a way to draw reasonably strong cause-effect conclusions about the impact of a training program. In such experiments, a sample of employees who need training would be randomly selected and then randomly assigned either to receive training or to spend an equivalent amount of time away from their jobs pursuing some alternative activity. The value of the training program could then be measured in terms of the size of the difference in job performance between the trained (experimental) group and the untrained (control) group. However, organizations rarely ask for experimental research on their training programs. Most of them merely hope that what seemed to be valuable training did, in fact, deliver information and skills that employees will remember and use to improve their job performance. Accordingly, evaluation tends to focus on nonexperimental designs using criteria such as employees' reactions to training, what they remember about it, and the changes in behavior that follow it.

Evaluation Criteria

The first kind of evaluation criteria, called *training-level criteria*, includes data collected immediately after a training session. Trainees are typically asked to fill out questionnaires about how much they liked the training and how valuable they felt it was. Training sessions that receive low ratings on enjoyment, value, and effectiveness are not likely to be repeated, at least not in the same format. But just as some effective teachers may not be immediately appreciated by their students, some effective training programs may receive low post-session ratings. A complete evaluation should consider other criteria as well.

A second class of evaluation criteria, called *trainee-learning criteria*, includes information about what trainees actually learned from the training program. These criteria are usually measured by a test similar to a college final exam that is designed to determine each trainee's knowledge and skill in the areas covered by the training. In some cases, alternative forms of this test are given to the trainees before and after training to assess how much improvement has taken place.

Finally, *performance-level criteria* measure the degree to which the knowledge and skills learned in training transferred to the employees' workplace behavior. If employees now know how to do a better job on the assembly line or at the hotel's front desk but do not apply this knowledge to improve their performance, the training program has not been successful. Organizations often evaluate training on the basis of criteria such as number or quality of products produced, frequency of customer complaints, or number of sales made. Significant improvements following training might be a result of that training, but because so few organizations conduct controlled experimental evaluations of training, drawing this conclusion is often risky. The improvement might have had less to do with the training than with some other uncontrolled factor, such as a downturn in the economy that motivated employees to work harder in an effort to keep their jobs.

Most I/O psychologists recommend evaluating training programs on as many criteria as possible, because the apparent value of training can depend on which criteria you consider (Sitzmann et al., 2008). A program that looks great on one criterion might be dismal on another. In particular, many programs that get high employee ratings on enjoyment, value, and other training-level criteria fail to show effectiveness in terms of

increased productivity, efficiency, or other performance-level criteria (Alvarez, Salas, & Garofano, 2004; May & Kahnweiler, 2000). For example, one training program that was designed to improve employees' interviewing skills received high ratings from the trainees, who showed improved interviewing during training. Unfortunately, these skills did not transfer to real interview situations (Campion & Campion, 1987). ("In Review: Recruiting, Selecting, and Training Employees" summarizes our discussion of these topics.)

IN REVIEW

RECRUITING, SELECTING, AND TRAINING EMPLOYEES

Process	Methods
Recruitment	Perform hiring needs assessment; place ads on websites and in newspapers; contact employment agencies; conduct campus interviews; solicit nominations from current employees; accept walk-in applications
Selection	Measure candidates' knowledge, skill, ability, and other personal characteristics using interviews, tests, and assessment centers; conduct validation studies to ensure that these KSAO criteria predict job success
Training	Conduct training needs assessment; design training to promote transfer of training, feedback, understanding of general principles, overlearning, and distributed training; evaluate training in terms of employee ratings of the experience and improvement in employee performance

In Review Questions

1. Employees tend to remember more from a training program when it is set up on a _____ rather than a _____ schedule.
2. Depending on walk-in applications is usually acceptable when hiring _____-level employees.
3. Assuring that your hiring criteria actually predict employees' job performance requires a _____.

EMPLOYEE MOTIVATION

What motivates employees to do their best?

In the chapter on motivation and emotion, we discuss some of the reasons why people engage in certain behaviors. These include biological, emotional, cognitive, and social factors that influence the direction, intensity, and persistence of behavior (Reeve, 1996; Spector, 2003). These factors are as important in the workplace, too (Nye et al., 2012). We can see motivation affecting the *direction* of work-related behavior in people's decisions about whether to work and what kind of job to seek. The effect of motivation on the *intensity* of work can be seen in how often an employee misses work, shows up late, works overtime, or goes beyond the call of duty. Motivation is also reflected in a worker's *persistence* at a task. Some employees give up as soon as difficulties arise, perhaps not bothering to pursue information if it is hard to find. Others keep trying, using every strategy possible until their efforts are successful.

Let's consider three theories that have been used by I/O psychologists to better understand employee motivation. One theory focuses on general factors that can affect behavior in the workplace and all other areas of life, too. The others highlight factors that are more specifically associated with motivation in the workplace.

ERG Theory

In the motivation and emotion chapter, we describe Abraham Maslow's (1943, 1970) theory, in which human behavior is seen as based on a hierarchy of needs or motives. These range from such basic biological needs as food and water to higher needs, such as esteem and self-actualization (see Figure 10.4). According to Maslow's theory, people must at least partially satisfy needs at the lower levels of the hierarchy before they will be motivated by higher-level goals. This is not always true, though. Hunger strikers, for example, ignore their need for food in order to pursue a protest that brings them closer to self-actualization.

To address some of the problems in Maslow's theory, Clayton Alderfer (1969) proposed **existence, relatedness, growth (ERG) theory**, which places human needs into three rather than five categories. *Existence needs* are things such as food and water that are necessary for survival. *Relatedness needs* include the need for social contact, especially having satisfying interactions with and attachments to others. *Growth needs* are those involving the development and use of a person's capabilities. These three categories of needs range from the most concrete (existence) to the most abstract (growth), but unlike the hierarchy of needs theory, ERG theory does not suggest that needs must be satisfied in any particular order. Instead, the strength of people's needs in each category is seen as rising and falling from time to time and from situation to situation. If a need in one area is fulfilled or frustrated, a person will be motivated to pursue some other needs. For example, after a relationship breakup frustrates relatedness needs, a person might focus on existence or growth needs by eating more or volunteering to work late. Similarly, losing a job frustrates growth needs, so a laid-off employee might focus on relatedness needs by seeking the social support of friends. Finally, a person obsessed with work-related growth needs might ignore those friends until after a big project is completed and it is time to party.

I/O psychologists apply ERG theory in the workplace by helping organizations recognize when employees' motivation to pursue job-related growth needs may be impaired because other need categories are frustrated or unfulfilled. For example, as we describe later, many organizations allow flexible working hours in the hope that employees will be more motivated on the job once they can more easily satisfy family-oriented relatedness needs.

Expectancy Theory

A second approach to employee motivation is similar in many respects to Julian Rotter's (1954, 1982) expectancy theory, which we discuss in the personality chapter. It seeks to explain how cognitive processes affect the impact of salary, bonuses, and other rewards on employees' behavior (Vroom, 1964). The main assumption of **expectancy theory** in the workplace is that employees behave in accordance with (1) what results they expect their actions to bring; and (2) how much they value those results. For example, the motivation to put out extra effort will increase if (1) employees expect a bonus for doing so; and (2) the bonus is valued enough to be worth the effort. Both expectancy and value are a matter of individual perception, though, so it is difficult to use expectancy theory to predict employee motivation by considering outcomes alone. If some workers don't believe that a supervisor will actually provide a bonus for extra work or if certain individuals are not strongly focused on money, the prospect of a bonus may not be equally motivating for all employees.

Workplace tests provide strong support for expectancy theory. One review of seventy-seven studies showed that how hard employees work and the quality of their work are strongly related to their expectancies about rewards and the value they place on those rewards (Van Eerde & Thierry, 1996). In other words, people tend to work hard when they believe it will be worth it to do so. Part of the task of industrial and organizational psychologists is to help organizations make employees feel that the effort needed for high performance is worthwhile.

existence, relatedness, growth (ERG) theory A theory of motivation that focuses on employees' needs at the levels of existence, relatedness, and growth.

expectancy theory A theory of workplace motivation in which employees are seen as acting in accordance with expected results and with how much they value those results.

In an ideal workplace, the goals of employees and employers are aligned. When they are not, a worker's motivation can suffer.

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Goal-Setting Theory

A third approach to employee motivation, called **goal-setting theory**, focuses on the idea that workplace behavior is affected partly by people's general needs and expectations, but also by their intentions to achieve specific goals. These goals can be short term, such as finishing a report by the end of the week, or long term, such as earning a promotion within the next two years. A basic prediction of goal-setting theory is that employees will be motivated to choose, engage in, and persist at behaviors that take them closer to their goals.

Goal-setting theory has proven quite useful in motivating employees. There is evidence that arranging for employees to spend some time setting specific goals can lead to better job performance (Locke & Latham, 1990). Many organizations encourage their employees to engage in goal-setting activities (Yearta, Maithis, & Briner, 1995), but I/O psychologists remind managers that some goals are more useful than others. The most motivating goals tend to be those that are (1) chosen, or at least accepted, by employees; (2) difficult enough to be challenging but not so difficult as to be impossible; and (3) specific enough (e.g., "increase sales by 10 percent") to allow employees to keep track of their progress and know when they have succeeded (Latham, 2004; Locke, 2000; Wegge & Haslam, 2005).

JOB SATISFACTION

Is pay the most important factor in job satisfaction?

Success in achieving workplace goals is one of many factors that can affect **job satisfaction**, the degree to which people like or dislike their jobs. Like other attitudes described in the chapter on social psychology, job satisfaction is made up of cognitive, emotional, and behavioral components (Schleicher, Watt, & Greguras, 2004). The cognitive component of job satisfaction includes *beliefs* about the job, such as "this job is too demanding" or "this job always presents new challenges." The emotional component includes positive or negative *feelings* about the job, such as boredom, excitement, anxiety, or pride. The behavioral component of job satisfaction is reflected in how people act in relation to their work, perhaps showing up early and staying late or maybe taking every opportunity to avoid work by calling in "sick."

goal-setting theory A theory of workplace motivation focused on the idea that employees' behavior is shaped by their intention to achieve specific goals.

job satisfaction The degree to which people like or dislike their jobs.

Measuring Job Satisfaction

I/O psychologists assess employees' attitudes about their jobs in general (a *global approach*) and about various aspects of it (a *facet approach*; see Table 17.4). In most cases, job satisfaction is measured using questionnaires. Some questionnaires, such as the Job in General Scale (Cooper-Hakim & Viswesvaran, 2005), take a global approach. Others, such as the Job Satisfaction Survey (Spector, 1985), are designed to assess attitudes about several job facets, including pay, promotion, benefits, coworkers, and supervision (see Figure 17.2).

TABLE 17.4 FACETS OF JOB SATISFACTION**TRY THIS**

Here are the results of a Gallup poll in which workers in the United States reported on their attitudes toward various facets of their jobs. Notice that workers tend to have differing attitudes about differing facets. For example, workers can be satisfied with their coworkers and supervisors but not satisfied with their salaries. How do you feel about your own job as "student"? Try listing those aspects of "studenting" that give you the most satisfaction, then take a poll among your student friends to see which aspects of their studentship give them the most satisfaction.

Facet	Percent Satisfied
Relationships with coworkers	94
Physical safety conditions of work	92
Flexibility of hours	90
Amount of work	88
Job security	87
Supervisor	84
Recognition received at work	81
Amount of vacation time	79
Salary	75
Promotion opportunities	68
Health insurance	64
Retirement plan	62

Factors Affecting Job Satisfaction

Satisfaction with a job in general or with its various aspects can vary widely from one person to the next, even when people do the same job in the same organization (e.g., Schleicher, Watt, & Greguras, 2004; Staw & Cohen-Charash, 2005). In other words, some employees may like jobs or aspects of jobs that others hate. I/O psychologists have studied several environmental and personal factors that can influence people's job satisfaction (Chudzikowski et al., 2009; Sonnentag, 2012). Among the environmental factors are the requirements of the job, how much it pays, and how it affects workers' lives outside of the workplace. Among the personal factors are workers' attachment styles, gender, age, and ethnicity (e.g., Richards & Schat, 2011).

Job Requirements

Some jobs, such as those of assembly line workers, involve performing the same, relatively simple tasks again and again throughout the workday. Other jobs, such as those in management, are more complex, requiring workers to perform a different set of tasks each day, often in response to unpredictable requests or demands. Is the complexity of a job related

FIGURE 17.2**Pay Satisfaction Subscale from the Job Satisfaction Survey**

Here are just four items from the pay satisfaction subscale of the Job Satisfaction Survey (Spector, 1985). As its name implies, this subscale focuses on employees' attitudes about the pay they receive in their jobs. Other subscales assess attitudes toward other job facets, such as promotion opportunities, benefits, co-workers, and supervisors.

Source: Paul E. Spector.

Please circle the one number for each question that comes closest to reflecting your opinion about it.					
1	2	3	4	5	6
1. I feel I am being paid a fair amount for the work I do.					
1	2	3	4	5	6
2. Raises are too few and far between.					
1	2	3	4	5	6
3. I feel unappreciated by the organization when I think about what they pay me.					
1	2	3	4	5	6
4. I feel satisfied with my chances for salary increases.					
1	2	3	4	5	6

to workers' job satisfaction? In general, yes. People tend to be more satisfied with jobs that are more complex (Fried & Ferris, 1987; Melamed, Fried, & Froom, 2001). As described in the chapter on motivation and emotion, this higher satisfaction may relate to the fact that more complex jobs tend to be more interesting, more challenging, and more likely to create a sense of responsibility and control in setting and achieving goals (Maynard, Joseph, & Maynard, 2006). However, not everyone responds to complex jobs in the same way (Jex et al., 2002). A complex job may create dissatisfaction among people who don't have the knowledge, skills, abilities, or other characteristics to do it successfully (Hackman & Oldham, 1980). Even individuals who have the necessary knowledge and skills may be dissatisfied with a complex job if their personality characteristics lead them to prefer simpler, less intellectually demanding work (Loher et al., 1985).

Salary

Many workers feel underpaid, but as discussed in the motivation and emotion chapter, higher salaries alone do not necessarily lead to higher levels of job satisfaction (Igalens & Roussel, 1999). One study of recent college graduates found a correlation of only +.17 between starting salary and overall job satisfaction (Brasher & Chen, 1999). A main reason for this low correlation is that a substantial salary may not compensate for other unsatisfactory aspects of a job, such as poor working conditions or lack of respect from supervisors. In fact, knowing that salary and pay raise decisions are made in a fair way can be more important to job satisfaction than the amount of money employees receive (Liao & Rupp, 2005; Simons & Roberson, 2003). As a result, students working at low-paying jobs may be more satisfied than executives who earn six-figure salaries. The student's satisfaction may come from knowing that everyone doing the same job is getting the same pay, whereas the executive may experience *relative deprivation*, the perception that others are unfairly receiving more benefits for the same or lesser effort (see the social psychology chapter).

Work-Family Conflict

Compared to many years ago, the number of two-career couples and single-parent families has increased in the industrialized world (Vespa, Lewis, & Kreider, 2013). With this increase comes more conflict between the demands of a job and the demands of family life (O'Driscoll, Brough, & Kalliath, 2006; ten Brummelhuis & Bakker, 2012). A common example of this

conflict is when the need to care for a sick child or attend a child's school play interferes with a parent's work responsibilities. For both men and women, the amount of conflict between the demands of job and family is strongly and consistently related to job satisfaction (e.g., Ford, Heinen, & Langkamer, 2007; Lapierre & Allen, 2006). I/O psychologists help organizations deal with this source of job dissatisfaction by developing *family-friendly work policies* that help employees balance work and family responsibilities. For example, *flextime* is a policy that allows parents to work an eight-hour day but frees them from the standard nine-to-five schedule. One parent can come to work at, say, 9:30 a.m. after taking the children to school and then stay on the job beyond 5:00 p.m. to complete an eight-hour day. The other parent can start work at, say, 7:30 a.m. and then leave early to pick up the children from school.

Gender, Age, and Ethnicity

The many studies that have compared job satisfaction in men and women have found few, if any, differences—even when the men and women compared were doing quite different jobs (e.g., Moncrief et al., 2000). Job satisfaction is related to age, though. Older workers tend to be more satisfied than younger ones, but the picture may be a bit more complicated than that (Clark, Oswald, & Warr, 1996; Hedge, Borman, & Lammelein, 2006). For example, among people who enter the world of work immediately after high school or community college, job satisfaction may at first be quite high but may soon begin to decline, especially among males. Satisfaction ratings then tend to increase slowly but steadily from about age thirty until retirement. This pattern may occur because young workers with relatively little education may find themselves in jobs that not only are poorly paid but also offer few of the features associated with job satisfaction, such as complexity, control over time, or opportunity to set goals and tasks (White & Spector, 1987).

Some studies of workers in the United States have found slightly higher job satisfaction among whites than among nonwhites (e.g., Jones & Schaubroeck, 2004; Tuch & Martin, 1991), but others have found no differences (e.g., Brush, Moch, & Pooyan, 1987). In fact, when comparisons are made across groups doing the same jobs, ethnicity does not appear to be a major factor in job satisfaction. Culture can have an influence though (Benton & Overtree, 2012). For example, one study found that job satisfaction among workers in the United States tends to be related to internal factors, such as feeling stimulated and challenged by their jobs, while satisfaction among workers in China may be related more to external factors, such as being offered new opportunities or satisfying the requests of their employers (Chudzikowski et al., 2009).

Minimizing Work-Family Conflict

TRY THIS To help working couples deal with the demands of work and family obligations, many organizations have adopted family-friendly programs and policies, including workplace daycare services and the availability of flexible work schedules (*flex time*). These programs and policies have been associated with higher levels of job satisfaction and less absenteeism among employees with children (Baltes et al., 1999; Scandura & Lankau, 1997). *Fortune* magazine publishes an annual issue listing the best U.S. companies to work for. Look through this year's issue to see what kinds of family-friendly policies these companies have created.

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THINKING CRITICALLY

IS JOB SATISFACTION GENETIC?

In the chapter on motivation and emotion, we mention that people's overall level of happiness, or subjective well-being, may be determined partly by genetic influences. Could those same influences operate in the workplace in relation to job satisfaction?

What am I being asked to believe or accept?

Richard Arvey and his colleagues (1989) have suggested that differences in job satisfaction reflect genetic predispositions toward liking or not liking a job.

What evidence is available to support the assertion?

People's temperament and personality are certainly influenced by genetics. Research in I/O psychology shows that these genetically influenced personality characteristics are related to people's job satisfaction (Illies & Judge, 2003). In one study, for example, hostility and other personality traits measured in adolescence were found to be significantly related to job satisfaction up to fifty years later (Judge, Heller, & Mount, 2002). Because personality is relatively stable across the life span, the link between personality and job satisfaction may explain why changing jobs has very little effect on job satisfaction. In fact, research suggests a "honeymoon-hangover" effect, in that job satisfaction often rises immediately after starting a new job, but then tends to decrease quickly to about the same level as it was at the previous job (Boswell, Boudreau, & Tichy, 2005). These data suggest that job satisfaction is at least indirectly shaped by inherited predispositions.

However, Arvey and his colleagues (1989) conducted what may be the only direct investigation of the role of genetics in job satisfaction. They selected thirty-four pairs of genetically identical twins who had been separated and raised in different environments. They then arranged for these people to complete a job satisfaction questionnaire. The questionnaire responses showed a strong positive correlation between the twins' job satisfaction; if one twin was satisfied, the other one tended to be satisfied, too. If one was dissatisfied, the other twin tended to be dissatisfied as well. The researchers suggested that because the members of each twin pair had been raised in different environments, genetic factors were at least partly responsible for creating the observed similarity in job satisfaction ratings.

Are there alternative ways of interpreting the evidence?

These results suggest a strong genetic influence, but they could have been affected by factors other than a genetic predisposition to be satisfied or dissatisfied with a job. For example, although the twins grew up in different home environments, their work environments might have been quite similar, and it may have been those similar work environments that produced similar satisfaction ratings. Why would separated twins have similar work environments? For one thing, the innate abilities, interests, behavioral tendencies, or physical characteristics that identical twins might share could have led them into similar kinds of jobs. Some pairs might have selected jobs that tend to be satisfying, whereas other pairs might have taken jobs that tend to be less satisfying. A pair of bright, athletic, or musically

Genes may play a role in job satisfaction, but other factors are surely at work as well.

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talented twins might have found it possible to have complex, interesting, and challenging jobs and to enjoy a high level of satisfaction. A less fortunate set of twins may have been unable to qualify for the kind of job they might want and may have settled for more routine work that leaves them feeling dissatisfied. In other words, it may be that genes don't shape job satisfaction itself but do help shape characteristics that influence people's access to satisfying work.

What additional evidence would help evaluate the alternatives?

One way to assess the impact of job characteristics on the high correlation in twins' job satisfaction ratings is to look at the nature of the twins' jobs. When Arvey and his colleagues (1989) did this, they found that the twins did tend to hold jobs that were similar in several ways, including overall job complexity and some of the skills required. A more complete assessment of the jobs and job environments would be needed, however, to determine the strength of these nongenetic factors in creating positively correlated job satisfaction ratings.

It will also be important to look for specific genes that might be associated with job satisfaction. Research has already linked job satisfaction with two specific genetic markers associated with the activity of the neurotransmitters dopamine and serotonin (Song, Li, & Arvey, 2011), and this line of research will undoubtedly continue.

What conclusions are most reasonable?

Research in I/O psychology suggests that individual differences in job satisfaction are probably related to workers' characteristics, some of which are influenced by genetics. However, the precise mechanisms through which genetics might affect job satisfaction are not yet clear (Ilies & Judge, 2003). It is most likely that job satisfaction, like so many other aspects of behavior and mental processes, is shaped by both genetic and environmental influences. So there is no single reason why people differ in terms of job satisfaction. How satisfied we are with our work can be predicted to some extent by job characteristics and to some extent by personal characteristics (Gerhart, 2005), but the outcome in a given case is ultimately a matter of who does what job in what organization.

Consequences of Job Satisfaction

Organizations spend a lot of time, money, and effort to try to maintain a reasonable level of job satisfaction among their employees. They do so, if for no other reason, because job satisfaction is linked to a variety of positive consequences for individuals, their coworkers, and their organizations (Harter et al., 2010). Dissatisfaction with a job can lead to numerous negative consequences.

Job Performance

Research shows that people who are satisfied with their jobs tend to be more motivated, work harder, and perform better than employees who are dissatisfied (e.g., Fisher, 2003; Judge et al., 2001). The positive correlation between job satisfaction and performance makes sense, and though a correlation alone cannot confirm that satisfaction is causing good performance, it is certainly consistent with that conclusion (Harrison, Newman, & Roth, 2006). It's possible, though, that people who perform better feel more satisfied with their jobs as a result (Jacobs & Solomon, 1977).

Organizational Citizenship Behavior

Job satisfaction is also associated with **organizational citizenship behavior (OCB)**, a willingness to go beyond formal job requirements in order to help coworkers and/or the organization (Ilies, Scott, & Judge, 2006; Organ, Podsakoff, & MacKenzie, 2006). As in

organizational citizenship behavior (OCB) A willingness to go beyond formal job requirements in order to help coworkers and/or the organization.

the case of job performance, it is difficult to determine whether job satisfaction causes increased organizational citizenship behavior or whether engaging in OCB causes increased job satisfaction. Further, OCB may reflect factors other than job satisfaction, such as personality characteristics (Chiaburu et al., 2011). And some cases of OCB might occur as part of a strategy designed to get a pay raise or promotion or reach some other personal goal. In one study, for example, employees who believed it would help their chances for promotion engaged in high levels of OCB before being promoted, then reduced their OCB afterward (Hui, Lam, & Law, 2000).

Turnover

Every organization must deal with a certain amount of *turnover*, or loss of employees. Some turnover is involuntary, as in cases of disability or dismissal, but much of it is voluntary (Harman et al., 2007). Some employees simply quit, and they tend to be employees whose job satisfaction is low (e.g., Griffeth, Hom, & Gaertner, 2000). However, in order to avoid unemployment, few dissatisfied workers quit until and unless they have found another job (Kammeyer-Mueller et al., 2005). So the relationship between job dissatisfaction and turnover is strongest when people are able to find other jobs (Trevor, 2001). When alternative employment is unavailable, even dissatisfied workers tend to stay put.

Absenteeism

You might expect that absenteeism, like voluntary turnover, would be strongly related to low job satisfaction. However, the correlation between job satisfaction and attendance is surprisingly weak (Farrell & Stamm, 1988). True, there is a tendency for dissatisfied employees to be absent more frequently than those who are satisfied, but other factors, including personal or family illness, work-family conflicts, and the financial consequences of missing work are far more important in determining who shows up and who doesn't (Dalton & Mesch, 1991; Erickson, Nichols, & Ritter, 2000).

Aggression and Counterproductive Work Behavior

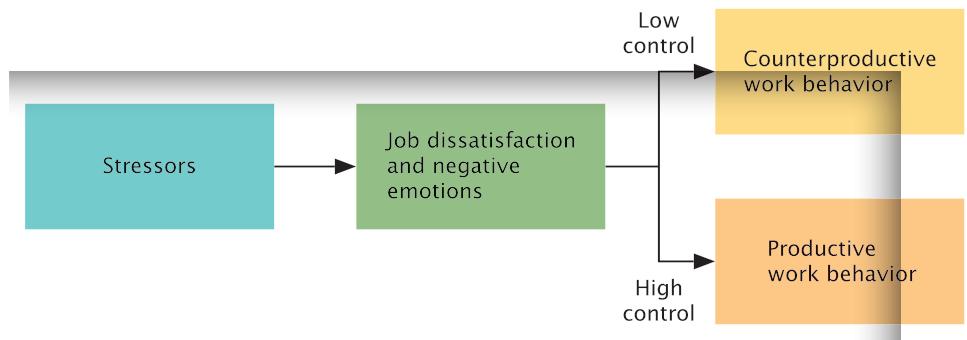
Job dissatisfaction is one cause of workplace aggression as well as of theft and other forms of *counterproductive work behavior (CWB)*. Assaults or murders involving co-workers or supervisors are rare (Barling, Dupre, & Kelloway, 2009; LeBlanc, Dupre, & Barling, 2006), but theft, computer hacking, and other forms of CWB by employees and former employees are commonplace. Employee theft in the United States alone costs organizations billions of dollars each year (Brown, 2010; Gatewood & Feild, 2001). In fact, employees steal more from their employers than do shoplifters (Hollinger et al., 1996; Rob, 2012). The direct and indirect costs of other forms of counterproductive work behavior, such as sabotage, working slowly, or doing jobs incorrectly, are staggering. But the true cost of CWB can be hard to determine because so much of it goes unnoticed (Bennett & Robinson, 2000).

As illustrated in Figure 17.3, it is often stress in the workplace that leads to job dissatisfaction and negative emotions, such as anger and anxiety (e.g., Spector, Fox, & Domagalski, 2006). These emotions, in turn, can result in CWB, especially among employees who feel they have been treated unfairly or have little or no control over stressors (Aquino, Tripp, & Bies, 2006; Penney & Spector, 2005; Whitman et al., 2012). Why does lack of control matter? As described in the chapter on health, stress, and coping, when people feel they have control over the work situation, they are more likely to perceive stressors as challenges to be overcome and to try constructive means of doing so. Suppose, for example, that a supervisor suddenly assigns a difficult task to an employee, who must complete it by the next day or face serious consequences. If the employee senses enough control over the situation to complete the task on time, this stressful assignment is likely to be perceived as a challenge to be mastered. If the employee doesn't have that sense of control

LINKAGES How do stressors affect job performance? (a link to Health, Stress, and Coping)

FIGURE 17.3
Job Satisfaction and Counterproductive Work Behavior

Workplace stressors can lead to job dissatisfaction, which leads to negative emotions and counterproductive work behavior, especially among employees who feel mistreated and unable to control stressors.



and believes it is impossible to meet the deadline, this stressful assignment will probably create dissatisfaction and negative emotions, such as resentment. This person is at elevated risk for engaging in counterproductive work behavior directed at the supervisor, the organization, or other employees.

LINKAGES What causes workplace aggression? (a link to Social Psychology)

LINKAGES

AGGRESSION IN THE WORKPLACE

In the chapter on social psychology, we describe a number of biological, psychological, and environmental factors that appear to be responsible for creating and/or triggering human aggression and violence. These factors operate in the workplace, too, but aggression between or against workers differs in some ways from violence outside of the workplace (Hershcovis et al., 2007).

About 70 percent of workplace homicides are committed against employees by strangers (U.S. Department of Justice, 2011). Despite well-publicized cases of disgruntled employees killing coworkers or supervisors, employees actually commit only about 21 percent of workplace homicides and less than 10 percent of workplace assaults (U.S. Department of Justice, 2011). Convenience store clerks, taxi drivers, and others who deal directly with the public, handle money, and work alone at night are the employees at greatest risk to be victims of workplace aggression (LeBlanc, Dupre, & Barling, 2006). Most aggression against these people is *instrumental aggression*, meaning that the aggressor's intent is not necessarily to injure but to achieve a goal such as getting money or other valuables (Merchant & Lundell, 2001). Though the perpetrator often uses a weapon to intimidate the employee, these aggressive incidents do not usually result in physical injury.

Most cases of injury in the workplace occur in the course of aggressive assaults on doctors, nurses, and other health care workers, sales clerks, bartenders, and food servers by patients or customers (Büssing & Höge, 2004; LeBlanc & Barling, 2004). Often these injuries occur under stressful circumstances—such as during emergency room treatment—in which pain, anger, fatigue, and frustration lead to an impulsive, emotional, aggressive outburst. In contrast to instrumental aggression, the perpetrator's intent in these cases is to injure the employee victim.

Aggression in the workplace is typically verbal, and the result is usually resentment and hurt feelings, not bruised bodies (Barling, Dupre, & Kelloway, 2009; Grubb et al., 2005). Like road-rage incidents, employee-to-employee aggression is often the by-product of an impulsive outburst under time pressure or other stressful conditions, such as workplace injustices or abusive supervision (Berry, Ones, & Sackett, 2007; Inness, Barling, & Turner, 2005). Sometimes, though, this form of aggression reflects a continuing attempt by one employee to control others through intimidation or bullying (Bies, Tripp, & Kramer, 1997; Grubb et al., 2005).

OCCUPATIONAL HEALTH PSYCHOLOGY

How can workplace accidents be prevented?

In the chapter on health, stress, and coping, we defined *health psychology* as a field devoted to understanding psychological factors in how people stay healthy, why they become ill, and how they respond when they do get ill (Taylor, 2002). **Occupational health psychology** is concerned with psychological factors that affect the health, safety, and well-being of employees in the workplace. I/O psychologists help promote the goals of occupational health psychology by consulting with organizations about ways to reduce threats to employees posed by undue stress, accidents, and hazards. Their success in this enterprise is reflected in the fact that today, most workplaces are safer and healthier than employees' own homes (National Safety Council, 2004).



Doing It Over and Over

TRY THIS Performing the same movements on the job hour after hour and day after day can lead to *repetitive strain injuries*. This employee's keyboard movements resulted in a painful and potentially disabling condition called *carpal tunnel syndrome*. Wearing a wrist brace can reduce the pain somewhat, but I/O and engineering psychologists know that improved wrist support for keyboard users can help prevent the problem in the first place. To appreciate the impact of psychologists' consultation efforts, browse some online computer equipment catalogs, such as geeks.com or tigerdirect.com, and calculate the percentage of keyboards, mice, and other devices that have been designed to minimize the possibility of repetitive strain injuries.

Lanica Klein/Photos.com

occupational health psychology A field concerned with psychological factors that affect the health, safety, and well-being of employees.

Physical Conditions Affecting Health

Many physical conditions in the workplace have the potential to cause illness and injury (Lund et al., 2006). Accordingly, in the United States, the Occupational Safety and Health Administration (OSHA) establishes regulations designed to minimize employees' exposure to hazards arising from sources such as infectious agents, toxic chemicals, or dangerous machinery. For example, to guard against the spread of AIDS, U.S. doctors, dentists, nurses, and other health care workers have been asked to follow a set of safety procedures called *universal precautions*, which include wearing disposable gloves when drawing blood, giving injections, or performing dental procedures and discarding needles and other sharp objects into special sealed containers.

These procedures may be effective in reducing the spread of disease, but health care workers do not always follow them, possibly because of heavy workloads and lack of encouragement from supervisors (McDiarmid & Condon, 2005). I/O psychologists play a role in this aspect of occupational health psychology by promoting organizational support for following proper safety procedures and by designing safety training that employees will actually use in the workplace (Smith-Crowe, Burke, & Landis, 2003). They also help protect employees' health by creating reminders to be careful on the job and by consulting with organizations to minimize stressors that can lead to illness or injury.

One of these stressors comes in the form of jobs that require performing specific movements in the same way over long periods of time, such as turning a screwdriver or making cut after cut in pieces of plastic. Eventually, these movements can create *repetitive strain injuries*, in which joints become inflamed, sometimes producing permanent damage. The most familiar of these injuries is *carpal tunnel syndrome*, a condition of the wrist that produces pain, numbness, and weakness in the fingers. Although often associated with using a computer keyboard or mouse, carpal tunnel syndrome can be caused by many other activities involving the fingers and wrist. Psychologists have been involved in two approaches to preventing repetitive strain injuries. First, as we describe in the introductory chapter, those working in *engineering psychology* (also called *human factors psychology*) consult with industrial designers to create tools and equipment that are less physically stressful to use. As a result, people who perform typing tasks for many hours each day now usually place a pad in front of their keyboard that provides support and helps keep their wrists from twisting. Second, I/O psychologists are working with organizations to ensure that employees whose jobs require repetitive actions be allowed to take breaks that are long enough and frequent enough to rest the body parts at risk for strain injuries. These psychologists are also working with employees to ensure that they follow the recommended break schedule.



Staying Sharp

I/O psychologists' research on the negative impact of extended work shifts has led to organizational and U.S. government rules requiring rest breaks at fixed intervals for commercial airline pilots, long-haul bus and truck drivers, and others whose jobs require constant attention to complex tasks and systems. The rules also limit the total number of hours these employees can work in any twenty-four-hour period.

Walter Hodges/keepsake/Corbis

Work Schedules, Health, and Safety

The arrangements mentioned earlier that allow employees to adjust their working hours are but one part of a more general trend away from the traditional nine-to-five workday. As many organizations expand their hours of service, including to twenty-four hours a day, seven days a week, more and more employees are on the job during what once would have been considered "odd hours." They may work at night or on weekends and follow shift patterns once associated mainly with hospitals, law enforcement, and factories. Others are working more than eight hours a day but less than five days a week, and in the face of staffing cutbacks, still others may be working more than forty hours a week. Whether undertaken by choice or by assignment, these nontraditional work schedules can create stress and fatigue that can adversely affect employees' health.

Rotating Shift Work

The negative effects of such schedules can be especially great among employees who change work shifts from week to week, rotating from evenings to days to nights, for example (Demerouti et al., 2004). As we describe in the chapter on consciousness, these shift changes disrupt employees' *circadian rhythms* of eating, sleeping, and wakefulness, resulting in a number of unpleasant mental and physical symptoms. A major problem with working night shifts, for example, is fatigue, irritability, and reduced cognitive sharpness resulting from difficulty in getting to sleep or staying asleep during the day (Morrisette, 2013). Some shift workers also experience upset stomachs and other symptoms of digestive distress (Rouch et al., 2005). These problems may be far less troubling for workers whose night shift assignments last long enough that they can get used to their "backward" schedule (Barton & Folkard, 1991), but rotating shift work can also be disruptive to employees' social relationships and may create work-family conflicts (Barnes-Farrell et al., 2008). Absenteeism, too, may increase, especially among younger workers who are new to shift work, and burnout and earlier retirement may be more common among workers on rotating shifts than among those on fixed schedules (Shen & Dicker, 2008).

Long Shifts and Long Weeks

Many organizations now have longer-than-normal work shifts. For example, some have set up ten-hour shifts that allow employees to work forty hours in four days, thus creating an extra day off. Others have replaced three 8-hour work shifts with a more efficient system of two 12-hour shifts that allows workers even more time off. Many employees like these arrangements, so longer shifts can lead to greater job satisfaction and better job performance (Baltes et al., 1999).

However, extended workdays may create health and performance problems for some workers in some jobs (Lamberg, 2004). This possibility is suggested by research on drivers of intercity buses. Those who drove longer routes that required being on the road for up to fourteen hours a day with few rest breaks tended to use stimulants to stay alert, drink alcohol to counteract the stimulants after arrival, and experience sleep disturbances, various physical symptoms, and anxiety and fatigue. They were also more likely than drivers with shorter shifts to be involved in accidents (Raggatt, 1991).

There are also dangers in requiring employees to work more than forty-eight hours per week, especially when those employees would prefer not to do so. These involuntary extensions of the work week have been associated with a number of employee health problems, particularly heart disease (Sparks et al., 1997). Accordingly, nations of the European Union have adopted regulations setting work weeks at a maximum of forty-eight hours. So far, there are no such governmental regulations in the United States.

Stress, Accidents, and Safety

Though most accidents occur outside the workplace, workplace safety is still a major focus of organizations and, therefore, of I/O psychologists (Barling & Frone, 2004). In just one recent year, 4,628 workers were killed and nearly 3 million others were injured on the job in the United States alone (U.S. Bureau of Labor Statistics, 2012). Motor vehicle accidents account for nearly half of all workplace fatalities. Falls and equipment accidents account for about another third of these deaths.

Longer-than-normal work shifts and extended work weeks are just one source of the occupational stress contributing to the fatigue, inattention, cognitive impairment, sleepiness, and other problems that elevate the risk of workplace accidents (Caldwell, 2012). I/O psychologists have identified many other individual and organizational factors that contribute to stress-related accidents. These include, for example, lack of clear instructions, heavy workloads, concern about job security, sexual harassment or ethnic discrimination, burnout, and workplace bullying (e.g., Berdahl & Moore, 2006; Hoel, Faragher, & Cooper, 2004; Schabracq, 2003; Sparks, Faragher, & Cooper, 2001). Accidents are also more likely when the *climate of safety* in the workplace is poor, meaning that there is a lack of safety training, too little supervisory emphasis on following safety rules, and a tendency for workers to ignore those rules (Griffin & Neal, 2000). Accidents are least common in organizations that create a *total safety culture* by providing adequate safety training for employees, conducting thorough and frequent safety inspections, and ensuring that supervisors consistently communicate the need for and value of safety (Newnam, Griffin, & Mason, 2008; Wallace, Popp, & Mondore, 2006).

WORK GROUPS AND WORK TEAMS

Do groups need supervision to work well?

A great deal of workplace activity is accomplished by groups of individuals working together. I/O psychologists have been at the forefront of efforts to help organizations maximize the effectiveness and efficiency of work groups and work teams (e.g., Barsade & Gibson, 2012; Ormiston & Wong, 2012; Shuffler, DiazGranados, & Salas, 2011). A **work group** is defined as at least two people who interact with one another as they perform the same or different tasks. The four servers waiting on customers during the dinner shift at a restaurant would be an example of a work group. A **work team** is a special kind of work group in which (1) each member's activities are coordinated with and depend on the activities of other members; (2) each member has a specialized role; and (3) members are working to accomplish a common goal (West, Borrill, & Unsworth, 1998). The entire staff on duty during the restaurant's dinner shift would be considered a work team. All members of the team are working on the same task with the same goal in mind—namely, to successfully serve customers as quickly and efficiently as possible. Further, each team member has a specialized role: greeters seat customers, servers take orders and deliver the food prepared by the cooks, and managers monitor progress, direct employees, and fill in at various tasks as needed. Whether it involves food service, brain surgery, automobile repair, or other workplace activities, an effective work team performs like the proverbial well-oiled machine.

work group At least two people who interact with one another as they perform the same or different workplace tasks.

work team A work group in which the members' specialized activities are coordinated and interdependent as they work toward a common goal.

Autonomous Work Groups

In most organizations, work groups and work teams operate in a traditional way, meaning that as in the case of a restaurant or grocery store, all workers report to a manager

Medical Teamwork

The doctors, nurses, and technicians who join forces to perform surgery are a perfect example of a work team. Everyone on the surgical team is devoted to the same goal of completing a successful operation, but each performs a somewhat different task in a coordinated way under the direction of the surgeon, who acts as the team leader.

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who directs and supervises their activities. However, a growing number of organizations today are establishing **autonomous work groups (AWGs)** that manage themselves and do not report to anyone for routine daily supervision. Instead, once AWGs are given a work assignment, it is up to them to determine how best to accomplish their goal and then work together to achieve it. The classic example of AWGs can be seen in the manufacturing sector. Automobiles and other consumer products were once built on long assembly lines by large numbers of workers who each performed only one small part of the process before passing the product on to another worker, who performed the next step. In AWGs, however, each member rotates among jobs, such that everyone is involved in every aspect of assembly from time to time. The team members also design and order their own tools, conduct their own product inspections to ensure quality and performance, and even participate in hiring and firing decisions. Many brands of automobiles and other large pieces of equipment are now assembled in AWG factories that feature a series of workstations where perhaps half a dozen employees assemble the entire product or a substantial portion of it.

AWGs have benefits for employees and for organizations. In one comparison study, employees in AWG factories reported higher levels of job satisfaction than did employees of traditional factories (Cordery, Mueller, & Smith, 1991). Further, the productivity of AWGs has been shown to be at least as good as and sometimes better than traditional arrangements despite the fact that AWG facilities don't need as many supervisors and thus cost less to run (Hoegl & Parboteeah, 2006; Stewart, 2006).

Group Leadership

autonomous work groups (AWGs)
Self-managed employee groups that do not report to anyone for routine daily supervision.

Workplace groups almost always have leaders. Even in AWGs, leaders tend to emerge (Taggar, Hackett, & Saha, 1999), although the leadership roles may sometimes be shared by more than one person (Uhl-Bien, Marion, & McKelvey, 2007). And AWGs are themselves embedded in organizations that operate through a leadership hierarchy (Kaiser, Hogan, & Craig, 2008). At each level, designated leaders direct or supervise the activities of others, set group and organizational objectives, figure out how individual employees can best contribute to

those objectives, and make sure employees perform the tasks assigned to them. Let's consider some of the characteristics of good leaders, how good leaders behave, and how they relate to various members of their work groups and work teams.

What Makes a Good Leader?

One way to study leadership is to look at lots of leaders to see whether particular kinds of knowledge, skill, ability, or other personal characteristics are associated with those who are effective and those who are ineffective. Much of what social and I/O psychologists have learned about the KSAOs of effective leaders comes from their research on managers (e.g., Peterson et al., 2003; Zaccarco, 2007). That research suggests that some characteristics are seen by almost everyone as necessary for good leadership. For example, a large study of leadership effectiveness in sixty-two countries found that being intelligent, trustworthy, and team-oriented were universally rated as important traits of good leaders (House et al., 1999). These results are supported by other studies showing that intelligence is consistently important for competent managerial performance (Chemers, Watson, & May, 2000; Judge, Colbert, & Ilies, 2004). In other words, smarter leaders tend to be better leaders. Good leaders also tend to score high on agreeableness, emotional stability, extraversion, and conscientiousness (Silverthorne, 2001). The value of other leadership traits can depend on social, cultural, and situational factors (Hoyt, Simon, & Innella, 2011; Livingston et al., 2012). For instance, a willingness to take risks tends to be seen as a positive leadership trait in some countries and as a negative trait in others (House et al., 1999). Further, a leader's success may sometimes depend more on the loyalty, organizational citizenship behaviors, and other "followership" traits of the particular people they lead than on their leadership style (Popper, 2011).

How Do Good Leaders Behave?

Another way to study leadership is to explore the things that effective and ineffective leaders do. The foundation for this research was provided by the Ohio State Leadership Studies, which began in 1945. The first step in this extensive program was to collect 1,800 critical incidents of effective and ineffective leader behavior. An example of "effective" leadership might be a situation in which a manager suggested that a troubled employee transfer to a less-demanding job; an example of "ineffective" leadership might be a situation in which a manager shouted at an employee who questioned the leader's decision. These and other studies have revealed that specific kinds of leader behaviors can have profound effects on group members and organizations. For example, one study found that army platoons led by active and involved leaders were especially effective under combat conditions (Bass et al., 2003). The Ohio State researchers identified two dimensions on which leaders typically vary. The first, called *consideration*, is the degree to which a leader shows concern for the welfare of employees, including friendly and supportive behavior that makes the workplace more pleasant. The second dimension, called *initiating structure*, is the degree to which a leader coordinates employee efforts by assigning tasks and clarifying expectations so that group members know what is required of them to perform well.

The relationship-motivated leaders described in the social psychology chapter tend to be high on the consideration dimension, whereas the task-motivated leaders described there tend to be high on the initiating-structure dimension. Where managers fall on each of these dimensions of leadership style can have important effects on employees (Eagly, Johannesen-Schmidt, & van Engen, 2003; Keller, 2006; Zaccarco, 2007). In one study, workers in a truck-manufacturing plant were asked to rate their immediate supervisors on the dimensions of consideration and initiating structure (Fleishman & Harris, 1962). These ratings were then related to the number of complaints these employees filed against their supervisors and the rate at which they quit their jobs (voluntary turnover). There were more grievances and much higher turnover among employees whose

supervisors had been rated low on consideration than among those whose supervisors had been rated high on consideration. More grievances were also filed by employees whose supervisors were high on initiating structure, but there is more to that part of the story. The highest rates of grievance and turnover occurred among employees whose supervisors were not only high on initiating structure but also low on consideration. As long as supervisors were high on consideration, they could be high on initiating structure without creating a lot of grievances and turnover. In other words, it is possible for a leader to be firm but fair, thus promoting maximum performance with a minimum of complaints and employee losses.

Leader-Member Interactions

Are leadership styles like the relatively stable traits described in the personality chapter? Do they create consistent leadership behaviors toward all group members in all situations? Some leaders might fit this description, but **leader-member exchange (LMX) theory** suggests that as leaders gain experience with their groups over time, most of them tend to adopt different styles with two different kinds of subordinates (Dansereau, Graen, & Haga, 1975; Naidoo et al., 2011). Leaders tend to offer the most consideration and best treatment to subordinates who make up the employee *ingroup*. These individuals tend to be the best performers and are seen by the leader as competent, trustworthy, loyal, and dependable (Bauer & Green, 1996). As such, ingroup members' opinions and requests tend to carry more weight with the leader than do those of *outgroup* employees, who are seen by the leader as less competent, less reliable, and potentially expendable. Ingroup members may also benefit from having "inside" information from the leader, more helpful mentoring, and perhaps even inflated performance evaluations (Duarte, Goodson, & Klich, 1993; Scandura & Schriesheim, 1994). Leaders give outgroup employees less opportunity to influence decisions and tend to supervise them by giving high structure and low consideration (Dansereau, Graen, & Haga, 1975).

More than eighty studies of leader-member interaction patterns support the existence of employee ingroups and outgroups. They also confirm the tendency for ingroup members to experience more job satisfaction and less occupational stress and to more often engage in organizational citizenship behaviors (Ilies, Nahrgang, & Morgeson, 2007; Schyns, 2006). By comparison, the job satisfaction and performance of outgroup members is likely to suffer, especially if they feel that the organizational climate is unjust (Hooper & Martin, 2007).

Traditional leadership models are based on situations in which there is face-to-face interaction among team members and leaders. Do these models apply equally well to "virtual teams" whose members communicate electronically (Zigurs, 2003)? Industrial and organizational psychologists are beginning to investigate this question, and the results of their research on *e-leadership* will undoubtedly expand our understanding of leadership as it operates in today's increasingly technology-driven workplaces.

Researchers have also begun to explore the idea of *shared leadership*, an organizational structure that focuses less on formally defined leadership roles and more on the informal structure that describes how things happen naturally in work teams (Carter & DeChurch, 2012; Contractor et al., 2012). People in a shared leadership framework do not assume that one person must hold the majority of influence in a team. Such a framework may be especially useful for understanding teams in which there is no overall "leader," as is often the case when groups of equally distinguished scientists from various fields work together on a single project. Shared leadership models may also be particularly relevant in workplaces where interdependent individuals work in groups whose membership frequently changes (Carter & DeChurch, 2012).

leader-member exchange (LMX) theory A theory suggesting that leaders tend to supervise ingroup and outgroup employees in different ways.

FOCUS ON RESEARCH METHODS

CAN PEOPLE LEARN TO BE CHARISMATIC LEADERS?

Some people's leadership abilities are so effective that they are described as *charismatic*. A *charismatic leader* is one who inspires followers to embrace a vision of success and make extraordinary efforts to achieve things they would not have done on their own (Bass & Riggio, 2006; Erez et al., 2008). Charismatic leaders such as Martin Luther King, Jr., and Sir Winston Churchill captured the imaginations of their followers. Dr. King led the fight for civil rights in the 1960s, inspiring countless thousands of followers to overcome entrenched opposition and personal danger to achieve the long-sought goal of equality under the law for African Americans. Prime Minister Churchill rallied the British people to resist and overcome the effects of Nazi air attacks during the darkest days of 1940 and throughout World War II. It has long been assumed that charismatic leadership is a by-product of a charismatic personality, not something one can learn.

What was the researchers' question?

I/O psychologists wonder, though, whether that assumption is correct. Might it be possible to train leaders to be charismatic, and if so, how would such training affect the job satisfaction and performance of those leaders' employees? Julian Barling, Tom Weber, and E. Kevin Kelloway (1996) addressed these questions by designing and evaluating a charisma-building training program for corporate managers.

How did the researchers answer the question?

Their study was conducted in twenty branches of a large Canadian banking corporation. The managers of these branches were randomly assigned to either a charisma training group or a control group that received no training. Two weeks before training began and five months after it was completed, the people working for each manager filled out a questionnaire, which included rating their manager's charisma. They also reported on their own level of job satisfaction. The financial performance of each branch office was measured before and after training, too.

Charisma training was delivered in five sessions over a three-month period. At the first session, managers met as a group to spend an entire day learning what makes charismatic leaders charismatic and practicing these behaviors in order to increase their own charisma. In the next four sessions, managers worked individually with one of the researchers, receiving additional training, getting feedback on performance, and setting goals for further progress.

What did the researchers find?

All the results indicated that this training program had a positive impact on managers' charisma. First, branch employees' ratings showed that managers in the training group were now more charismatic. There was a small decline in charisma for those in the control group. Second, employees who worked for the managers who had received charisma training reported higher levels of job satisfaction after training than did those who worked for the untrained managers. Finally, the financial performance of the trained managers' branches increased, whereas that of the untrained group decreased somewhat.

What do the results mean?

This charisma training program may not have produced a Martin Luther King, Jr., or a Winston Churchill, but its impact supports the notion that charisma can be taught, at least to some extent (Frese, Beimel, & Schoenborn, 2003). The trained managers became more charismatic and more effective than their untrained colleagues, suggesting that charisma involves behavior that can be learned by people with many different personality characteristics.



A Charismatic Leader

Apple founder Steve Jobs was considered by many to exemplify the kind of leader whose charisma inspires followers to accomplish what they might not otherwise have done.

Zuma Press, Inc./Alamy

(continued)

What do we still need to know?

The findings of this study are encouraging, but we should be cautious in interpreting them. For one thing, the changes seen in the trained managers might have been due to factors other than the training itself. As described in the introductory chapter, improvements following almost any treatment may be due partly or largely to placebo effects or other factors that create positive expectations among research participants. If the managers expected to be better at their jobs as a result of training and if their subordinates expected them to be better managers, it could have been these expectations rather than the training that caused the behavior changes and/or the increased charisma ratings. Even the improved financial performance could have been the result of expectation-driven efforts by managers and employees to do better, efforts that had nothing to do with the training itself. Interpreting the results of this experiment would have been easier if members of the untrained group had participated in some sort of placebo program that, like the charisma training, would have raised their expectations and those of their employees.

Even if the training program actually was responsible for the improvements seen, it would be important to know whether its effects would last beyond the five-month follow-up period. If it does have long-term effects, it would then be important to evaluate charisma training with leaders in other kinds of organizations and at other levels of leadership. It will take time and a lot of research to explore these matters, but if charisma can indeed be taught, we may someday see candidates for political office lining up to learn it.

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of aggression in the workplace illustrates just one way that the topic of this chapter, industrial and organizational psychology, is linked to the subfield of social psychology, which is covered in the chapter by that name. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 17 Industrial and Organizational Psychology



LINKAGES

How do stressors affect job performance?



CHAPTER 12
Health, Stress, and Coping

What methods are used to select good employees?



CHAPTER 13
Personality

What causes workplace aggression?



CHAPTER 16
Social Psychology

SUMMARY

An Overview of Industrial and Organizational Psychology

What do industrial and organizational psychologists do?

Industrial and organizational (I/O) psychology is the science of behavior and mental processes in the workplace. I/O psychologists study the psychology of the workplace and apply psychological research to enhance the performance of employees and organizations and improve the health, safety, and well-being of employees. I/O psychology grew out of experimental psychology early in the twentieth century as psychologists began to apply laboratory research to workplace problems.

Assessing People, Jobs, and Job Performance

How do industrial and organizational psychologists match employees to jobs?

The development and evaluation of methods for assessing employees, jobs, and job performance is one of the main areas for scientific research in I/O psychology. The human attributes necessary for doing jobs successfully are referred to collectively as KSAOs, which stands for knowledge, skill, ability, and other personal characteristics.

A **job analysis** is the assessment of jobs and job requirements. It may be job oriented (describing job tasks), person oriented (describing the KSAOs necessary to perform job tasks), or both. Organizations use job analysis information for many purposes, including employee hiring and training.

The three main methods used to measure employee characteristics are psychological tests, job applicant interviews, and assessment centers. Tests can focus on employees' knowledge, ability, skill, and other characteristics, such as personality traits. A job applicant interview is designed to determine an applicant's suitability for a job. It can be structured or unstructured, but structured interviews are far more effective in selecting successful employees than unstructured interviews, in which questions are not organized ahead of time. An **assessment center** is an extensive battery of exercises used to determine whether a person is suited for a particular job.

Most organizations give an annual **job performance** appraisal to all employees. Much like a school report card, these appraisals describe how well a person is doing in several job domains. Performance is measured in relation to general (theoretical) criteria as well as in relation to more specific (actual) criteria.

Objective measures of job performance rely on counting behaviors or the results of behaviors. These measures are valuable, but they are not appropriate for evaluating performance in jobs that have little or no objectively measurable output. Subjective measures can be used in any job situation, but because they rely on supervisor ratings of performance, these measures may be distorted by judgment bias or error.

Recruiting and Selecting Employees

How do organizations find good employees?

I/O psychologists frequently use assessment tools to help hire people who will be best able to succeed in particular jobs. The first step in effective recruiting is to determine what employees are needed and then attract applicants to fill those needs, using employment agencies, Internet and print advertising, and campus visits; encouraging nominations from current employees; and accepting walk-in applications.

The I/O approach to hiring uses scientific principles to match jobs to the KSAOs of applicants. Establishing the KSAO requirements of a job helps determine which employee assessment tools will be most appropriate, and validation studies may be used to confirm that particular scores on the chosen assessments actually predict success on the job. Many industrialized countries have established laws and regulations that bar discrimination in hiring, firing, or promotion based on ethnicity, age, gender, or any other characteristics that have nothing to do with job performance.

Training Employees

What kind of training do employees need?

I/O psychologists help organizations establish the need for training, design training methods and content, and evaluate the outcome of training. Using a training needs assessment, organizations determine what training employees need in order to perform their jobs safely and well. Training needs assessments can focus on what KSAOs are required for specific jobs, on what training employees say they need, and on the objectives of the organization, such as improving production and decreasing accidents.

The design of training programs is guided by research on the processes through which people acquire new information and skills. These principles are translated into employee training that emphasizes transfer of training (applying new skills to the workplace), feedback (providing reinforcement for progress and guidance and encouragement following errors), training in general principles (providing "big picture" information to show the relevance of training), overlearning (practicing new skills until they become automatic), and sequencing (distributing training over time to improve learning and retention). A training program can be evaluated in terms of how trainees felt about the training (training-level criteria), what trainees actually learned during training (trainee learning criteria), and/or the degree to which trainees used what was learned during training in doing their jobs (performance-level criteria).

Employee Motivation

What motivates employees to do their best?

Motivation in the workplace refers to factors that influence the direction, intensity, and persistence of employees' behavior. Three theories of motivation have special workplace applications. **Existence, relatedness, growth (ERG) theory** divides human needs into existence needs (e.g., for food and water), relatedness needs (e.g.,

social contact), and growth needs (the development and use of one's capabilities). It suggests that the strength of each type of need affects workers' motivation to do their jobs well. According to **expectancy theory**, employees work hard if they perceive it to be in their best interest to do so. **Goal-setting theory** describes workers' motivation as stemming mainly from their desire to achieve short- and long-term goals. According to this theory, organizations should help employees set clear, specific goals that are challenging but not impossible.

Job Satisfaction

Is pay the most important factor in job satisfaction?

Job satisfaction is a cluster of attitudes that reflect the degree to which people like their jobs. It is usually assessed using questionnaires that ask employees to say how they feel about their jobs in general (the global approach) or about pay, supervision, or other specific job components (the facet approach). I/O psychologists have studied several environmental and personal factors that can influence people's job satisfaction. Among the environmental factors are the requirements of the job, how much it pays, and how it affects workers' lives outside the workplace. Among the personal factors are workers' gender, age, and ethnicity. For the most part, complex jobs tend to be more satisfying than simple jobs. Salary itself may be a less important factor in job satisfaction than the fairness of the salary system. Excessive work-family conflict can reduce job satisfaction. Because of temperament and experience, some individuals may have a tendency to be more satisfied with their jobs than others.

Job satisfaction has been associated with better job performance and with **organizational citizenship behavior (OCB)**, but it isn't clear whether satisfaction is a cause or an effect of these attributes. Job dissatisfaction is clearly at work in causing people to quit their jobs (turnover), but it has a smaller effect on absenteeism. Job dissatisfaction can also lead to aggression and counterproductive work behavior (CWB) such as theft or sabotage. CWB is especially likely among dissatisfied employees who work under conditions of high stress and low perceived control.

Occupational Health Psychology

How can workplace accidents be prevented?

Occupational health psychology is concerned with psychological factors that affect the health, safety, and well-being of

employees. A number of physical conditions in the workplace can affect health, including infectious agents, toxic chemicals, dangerous machinery, and stressors such as the need to perform repetitive actions.

Work schedules, too, can have an impact on health and well-being. Rotating shift work, extended shifts, and longer-than-normal work weeks have been associated with a variety of problems ranging from fatigue and sleeping problems to substance abuse and increased risk of heart disease. Reduction of workplace accidents can be accomplished not only by reducing occupational stressors but also by promoting a climate of safety. Workplace accidents are least frequent in organizations that provide rigorous safety training, conduct frequent safety inspections, and encourage adherence to safety procedures.

Work Groups and Work Teams

Do groups need supervision to work well?

A **work group** is a collection of people who interact on the job, whereas a **work team** is a group in which members depend on one another as they work at specialized yet coordinated tasks aimed at accomplishing a common goal. Unlike traditional, closely supervised work teams, **autonomous work groups (AWGs)** are assigned tasks and then given the freedom to manage themselves, solve their own problems, and even influence hiring and firing decisions, all of which tend to result in greater job satisfaction among team members.

Leaders direct or supervise the activities of others, set group and organizational objectives, and ensure that employees perform their assigned tasks. Certain characteristics tend to be universally seen as desirable leadership attributes; others may not be seen as ideal in all cultures. Two dimensions of leadership style—consideration and initiating structure—have been found to have strong effects on employees' performance and job satisfaction. **Leader-member exchange (LMX) theory** suggests that leaders adopt different styles toward ingroup and outgroup employees. Charismatic leaders have the ability to influence and inspire employees to accomplish things they would not have done on their own. Charisma in leaders tends to promote job satisfaction in employees, and there is evidence that some aspects of charisma can be taught.

TEST YOUR KNOWLEDGE

Select the best answer to each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. I/O psychologists _____.
 - a. conduct research on behavior and mental processes in the workplace
 - b. focus mainly on improving the efficiency of employees
 - c. focus mainly on the development of intelligence and personality tests
 - d. work mainly for government agencies

2. Donald Crump's new business has grown so quickly that he needs to hire more employees. The first thing that Mr. Crump should do is _____.
 - a. interview all applicants
 - b. create psychological profiles of the best applicants
 - c. conduct a job analysis of each open position
 - d. identify the salary for each position

- 3.** You have been hired to conduct a job analysis at a local fast-food chain. After completing your analysis, you conclude that the job requires cooking hamburgers. What type of job analysis have you performed?
- Job oriented
 - Person oriented
 - Analysis oriented
 - Performance oriented
- 4.** Jobs require individuals with specific knowledge, skill, ability, and other personal characteristics. These KSAOs are identified by a detailed study called a _____.
- job assessment study
 - job analysis
 - KSAO-ometry
 - computer-aided assessment
- 5.** Attributes or characteristics necessary to successfully perform a job are called _____.
- compensable factors
 - critical factors
 - KSAOs
 - essential functions
- 6.** Larry Recruiter is interviewing potential employees at an on-campus job fair. To find the most appropriate candidate for his job opening, Larry should use _____ interviews.
- unstructured
 - panel
 - structured
 - inferential
- 7.** A large company is most likely to select high-level managers using mainly _____.
- assessment centers
 - unstructured interviews
 - letters of recommendation
 - personality tests
- 8.** Performance appraisal information can be used for _____.
- employee development
 - decisions about pay increases
 - evaluating the need for new training
 - all of the above
- 9.** Consider the job of "student." Which of the following is a theoretical criterion for this job?
- The number of A's earned in a three-year period
 - The total value of scholarships obtained over a three-year period
 - Engaging in scholarly activities
 - The number of clubs joined
- 10.** Which of the following reflects a subjective measure of a teacher's job performance?
- The average of student ratings on a course evaluation questionnaire
 - The average size of the teacher's classes
 - The number of courses taught
 - The frequency of being late for class
- 11.** Ruth is evaluating all of the employees in her department. To be as fair as possible, she uses behavior-focused ratings. This means that Ruth will _____.
- interview each employee in an unstructured way.
 - give each employee global ratings in areas such as efficiency and honesty.
 - rate employees on their handling of critical incidents in their job.
 - observe each employee's performance for one day.
- 12.** Organizations hope that employees will apply to their jobs what they learn during training. This process is called _____.
- response discrimination
 - transfer of training
 - application management
 - training to learn
- 13.** _____ training is more efficient, but _____ training is more effective in the long run.
- Part; whole
 - Whole; part
 - Massed; distributed
 - Distributed; massed
- 14.** Which of the following aspects of employee training is *not* usually done by I/O psychologists?
- Conducting a training needs assessment
 - Delivering the training
 - Designing the training
 - Evaluating the training
- 15.** The need for water is an example of a _____ need in Maslow's hierarchy of needs theory and of a(n) _____ need in Alderfer's ERG theory of employee motivation.
- physiological; relatedness
 - safety; existence
 - safety; growth
 - physiological; existence
- 16.** According to the _____ approach to job satisfaction, people can be satisfied with some aspects of their jobs and dissatisfied with other aspects of their jobs.
- global
 - facet
 - ERG
 - expectancy
- 17.** If Eric is satisfied with his job, he most likely _____.
- earns a lot of money
 - feels that his company's promotion and salary decisions are fair
 - has a job that does not require complex thinking
 - works alone with few distractions

- 18.** Which of the following statements about counterproductive work behavior (CWB) is correct?
- a. Employees steal more from their employers than do shoplifters.
 - b. Dissatisfied employees are much more likely to be absent from work than satisfied employees.
 - c. Employees are more likely to engage in CWB if they feel in control of their work.
 - d. Assaulting a coworker is as common as stealing from a coworker.
- 19.** Five students in an advertising class jointly prepare a sixty-second commercial, each taking a separate production role. The quality of the commercial determines the project grade for all five students. These five students constitute a _____.
- a. work group but not a work team
 - b. work team
 - c. group-think
 - d. nominal group
- 20.** Which leadership theory emphasizes the relationship between the leader and individual group members rather than between the leader and the group as a whole?
- a. Leader-member exchange theory
 - b. Vroom-Yetton model
 - c. Leader behavior theory
 - d. Path-goal theory

Neuropsychology



Daniel Matzenbacher/Alamy

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Preview

Something was wrong with Max. He put away his car keys, his wallet, and a pair of dress shoes in their usual places, but when he tried looking for them later, he had no idea where they were. "You're just getting forgetful," his wife teased. But at breakfast one morning, he used a piece of bacon to stir his coffee. Then, mistaking a candle on the table for a glass of juice, he tried to drink it, and he used a pancake as a napkin, wiping his mouth with it before placing it on his lap. He seemed puzzled by these mistakes. His wife took him to a doctor. Suppose you were that doctor. How could you know what was wrong with Max? You could consider many possibilities. Maybe he is choosing to be silly to annoy his wife. But if he is not acting oddly on purpose, where does the problem lie? Perhaps his mind is being affected by a problem in his brain. The problem might affect his memory systems, but it might also be affecting attention or some other psychological function. Of course, the problem might be something less specific. Perhaps he has just been working too hard or is having a reaction to a medication or some sort of dietary deficiency. He might be experiencing depression, or maybe an unrecognized infection is affecting his ability to remember and concentrate.

Understanding what the problem is for someone like Max, exactly where it is, and how it affects a person's behavior and mental processes takes us into the realm of neuropsychology. In this chapter, we will describe how neuropsychology developed, what it has revealed about the relationship between brain functions and psychological functions, and how neuropsychologists study patients on a case-by-case basis. We will also describe some of the most interesting examples of what can go wrong in the brain and how these problems can affect people's thoughts, actions, and abilities.

FOUNDATIONS OF NEUROPSYCHOLOGY

What is neuropsychology and how did it develop?

Neuropsychology is the subfield of psychology whose goal is to explore and understand the relationships among brain processes, human behavior, and psychological functioning. *Neuropsychologists* study how brain systems, and disruptions of those systems, affect a wide range of human abilities, including cognitive functions (such as language, memory, attention, mathematical, and visual-spatial skills), motor functions (such as walking or threading a needle), emotional functions (such as the ability to express emotions and understand other people's emotional expressions), and social functions (such as daily interactions with others). They study, too, how the brain affects personality and psychological disorders such as depression.

The field of neuropsychology rests on two main assumptions. The first is that many complicated mental tasks, such as memory or decision making, involve numerous subtasks that can be tested and studied separately (Lezak, Loring, & Howieson, 2004). For example, as described in earlier chapters, the ability to form a new memory usually requires a person to be awake, to pay attention, to receive sensations, to perceive those sensations, to form mental representations of that information, to be motivated to remember the information, and to have the language or other verbal skills necessary to express the information when it is retrieved from memory. If any of these subtasks fail, a person's memory function would fail in any number of everyday situations. With this assumption about subtasks in mind, neuropsychologists must not only figure out what complicated mental tasks a person can and cannot do but also identify the failure of one or more subtasks that may be at the root of the problem.

The second main assumption of neuropsychology is that different psychological processes are controlled by different brain regions or by different combinations of brain regions

neuropsychology The subfield of psychology whose goal is to explore and understand the relationships among brain processes, human behavior, and psychological functioning.

(Fodor, 1983; Sternberg, 2011). Neuropsychologists use this assumption to draw conclusions about each patient they examine. After deciding what psychological processes are impaired, they work backward to infer what brain region or combinations of regions may not be working properly. This “working backward” approach is valuable, because many kinds of brain damage or disease are too subtle to be identified by physical examination or by various brain-scanning procedures (Nadeau & Crosson, 1995). Also, this approach helps implicate which areas of known brain damage may be symptomatic and which may not be so.

Using these two main assumptions, some neuropsychologists conduct research on how the human brain controls and organizes separate parts of complicated mental activities. These scientists, known as *experimental neuropsychologists*, most often study people with brain damage, but they sometimes do research on people with normal brains too. Their aim is to add to our knowledge of brain functioning among people in general. **Clinical neuropsychologists** use this knowledge to try to understand the problems that appear in a particular patient, such as Max. They look for the best way to examine a person so as to determine the likelihood and location of brain dysfunction by learning what psychological processes are impaired and exactly how they are impaired (Lezak et al., 2012). Most clinical neuropsychologists are to be found in hospitals and other health care settings, where they work with physicians to test people with brain damage (Johnson-Green & Collins, 2011).

For example, think back to our friend Max. He was tested by a clinical neuropsychologist. She showed Max a long series of simple drawings of common objects and asked him to name each one. Experimental neuropsychological research on large numbers of people provided *norms* that told her what kind of performance she could expect on this test from people of Max’s age and educational background. She could then compare his performance with these norms. As you might expect, Max’s responses were not normal. For example, looking at the drawing of a pencil, he said he saw “a long, narrow protrusion of some kind.” He called a paper clip “an object curling into itself.” For eyeglasses, he said, “That’s two circular devices suspended together.” Clearly he was not naming things well—but why? Could his vision be bad? No, because his descriptions were visually accurate, and he could correctly read words in small print. He could also produce reasonably accurate copies of the drawings, even though he could not always name the objects in them. These findings meant that he had sensed and perceived the drawings’ shapes, angles, and spatial relationships. Did Max have a general problem with memory, as his wife suggested? To test that idea, the neuropsychologist read him lists of words and later asked him to recall them. He did about as well on this memory test as most people of his age and level of education, so his memory seemed normal. The neuropsychologist next considered whether Max was no longer able to understand the concepts represented in the drawings. But this possibility was ruled out when he correctly defined the words *pencil*, *paper clip*, and *eyeglasses*. So he knew about these objects, and when examples of them were placed into his hands while he was blindfolded, he could name them instantly. So Max could recognize these objects through his sense of touch but not through his sense of vision.

Why? The neuropsychologist concluded that Max still had normal function in brain systems that process basic visual sensations but that something was wrong with the brain systems that normally convert those sensations into recognizable visual perceptions. This problem is called a *visual agnosia* (pronounced “ag-NOH-zhuh”), and it can occur when parts of the temporal lobes on both sides of the brain do not work properly (Devinsky, Farah & Barr, 2008). Max’s physician used that information to focus his medical care on those brain regions.

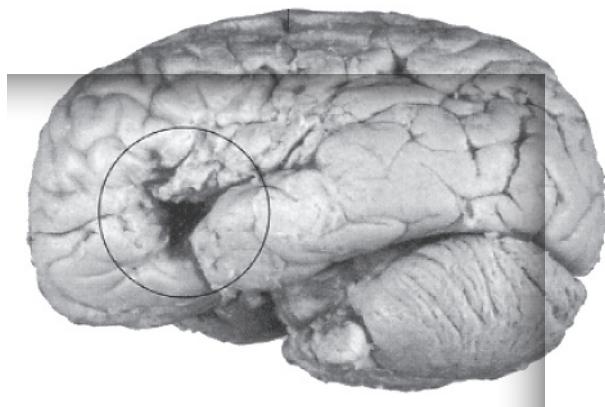
Max’s case illustrates several important aspects of what neuropsychologists have learned about how the brain operates. Let’s review some of what they have discovered and how these discoveries occurred.

A Brief History of Neuropsychology

Max’s case shows **localization of function**, the idea that specific psychological functions can be affected by damage to specific brain areas. This concept might seem obvious to you, especially if you have read about the brain in the chapters on biological aspects of psychology,

clinical neuropsychologists Neuropsychologists who use tests and other methods to try to understand neuropsychological problems and intact functions in individual patients.

localization of function The idea that specific psychological functions can be affected by damage to specific brain areas.

**FIGURE 18.1****Tan's Brain**

When Tan died, surgeon Paul Broca discovered severe damage in the left frontal lobe of the cerebral cortex, just in front of the primary motor cortex. Now called Broca's area, it is involved with the ability to produce normal speech.

*From Corsi, P., ed. *The Enchanted Loom*. New York: Oxford University Press, 1991. Musée Dupuytren, Paris. Photo courtesy of Dr. Jean-Louis Signoret*

sensation and perception, and consciousness. But this “commonsense” notion was born amidst considerable debate (Tyler & Malessa, 2000), some of which continues today. Indeed, for centuries, philosophers and scientists have speculated on the role of different brain areas in different psychological functions (Eling, 2008; Kaitaro, 2001).

Early in the 1800s, the dominant view was that the brain worked more or less as a single organ, and that no one part was more important than any other in the control of mental life. An anatomist named Franz Gall disagreed with this view, arguing instead that different brain areas each controlled particular aspects of cognitive function (Zola-Morgan, 1995). Some of Gall's ideas turned out to be correct, and his legacy would be more widely honored except for the fact that Gall also mistakenly believed that brain areas, like muscles, get bigger as people use them. He believed, too, that each brain area is associated with personality traits,

such as honesty or love or aggressiveness. Fatal to his legacy, Gall claimed that as brain areas grew larger, there would be corresponding bumps in the skull just above them. He created a map showing which brain areas were supposedly controlling which traits, and he used it to assess a person's psychological makeup by measuring the bumps on the skull. Gall's approach, known as *phrenology*, was a hit with the public because it promised a simple way to measure personality (Benjamin & Baker, 2004). But assessing personality by feeling people's skulls was a far-fetched and easily refuted notion. Thus, Gall's scientific colleagues dismissed virtually everything he said about the brain's role in psychology, and the ridicule heaped on phrenology tainted any claims of localization of function.

Everything changed in 1861 when a famous and widely respected French surgeon, Paul Broca, examined a hospitalized patient whose leg had gangrene, a serious deep-tissue infection. (In this era before antibiotics, gangrene often required amputation.) It so happened that many years earlier, this patient had had a **stroke** (also called a **cerebral infarct**)—a condition in which one of the blood vessels to the brain is blocked, causing permanent damage to the brain. The stroke left the patient unable to say anything but the word *tan*, which became the staff's nickname for him. Despite his speech difficulties, “Tan” could apparently understand most spoken language because he easily followed verbal commands. Before anything could be done about Tan's gangrene, he died, and Broca ordered an autopsy. It showed a small **lesion**, or area of damage, in the left frontal lobe of Tan's brain (see Figure 18.1). Broca wondered if this lesion was related to Tan's speech problems. But, if so, how could such a small lesion create such a major and specific problem? Not long afterward, Broca requested an autopsy on another patient who had had language problems similar to Tan's and discovered a brain lesion in the same place as Tan's.

If lesions in this particular spot were somehow linked to these patients' language disorders, the previously dismissed idea of localization of function might be correct. Indeed, a particular brain area could be involved in controlling a particular function such as speech (Broca, 1861, 1865). This is precisely what Broca proposed when he shared his observations in a lecture to the Anthropological Society of Paris. And because, unlike Gall, Broca held such high status in the scientific community, his support of localization of function made it a respectable idea. The resulting explosion of brain research in the past century and a half has established that localization exists and is more complex than anyone in Broca's time had guessed.

stroke (cerebral infarct) A loss of blood supply to some part of the brain, resulting in brain damage that disrupts some aspect of behavior or mental processes.

lesion An area of damaged tissue in the brain.

modules Regions of the brain that perform their own unique kind of analysis of the information they receive.

Modules and Networks

Modern approaches to localization of function rest on the idea that the brain is organized into discrete regions called **modules**, each of which adds its own unique kind of analysis of the information it receives (Fodor, 1983; Sternberg, 2011). According to a *modularity* view, each module, located in a unique brain area, acts somewhat like a circuit board in a computer. That is, a module does not itself “control” any particular function, but it adds a needed piece to complete a larger puzzle that allows speech or some other function to occur. The analysis performed by a particular module can be used in many kinds of brain functions. And each

brain function—whether it is detecting the edges of an object or making a decision about something—is accomplished through the support of a different team, or *network*, of modules (Sporns, 2011). It is as if a brain were the head of a company with a vast array of employees, each with a specific skill, which can be organized and reorganized from one moment to the next into many different work teams to perform many different tasks. In this way, some of the same brain areas might be used in many different psychological tasks, but the exact combination of which areas are used and when may still differ from one function to another.

Speaking and understanding language, for example, involves a network of modules in several brain areas (Friederici, 2011). This means that damage to any part of the network may affect a person's language ability in some way, but the exact effect will depend on which part of the network is damaged. In Tan's case, for example, the lesion in his left frontal lobe disrupted his ability to speak but left him with the ability to understand what was said to him.

The brain regions used in language are a good example of a network that uses several modules. One of the interesting consequences of organizing a system in this way is the potential for a *disconnection syndrome*. Such syndromes occur when different modules in a network, though themselves intact, are prevented from interacting (Geschwind, 1968). A classic example is *alexia without agraphia*, which literally means inability to read while still being able to write (Sheldon, Malcolm, & Barton, 2008). The brain damage shown in Figure 18.2 could produce this kind of disconnection syndrome. Here, there is damage to the left occipital lobe, causing loss of vision, but only for what is on the right side of the visual field. The patient can still see the left side of the visual field. However, there is also damage to the corpus callosum, which connects the left and right hemispheres of the brain. The damaged area of the corpus callosum would have allowed visual information from the left side of the world to cross from the right hemisphere into the left hemisphere, but now this pathway is blocked. Because the language-producing regions of the left hemisphere are intact, the person can still talk and write normally but can see only what lies in the left visual field. That information goes to the right hemisphere, but because it cannot cross into the left hemisphere, where most language functions reside, people with this disconnection syndrome cannot read what they have written. In effect, the visual processing of the words is disconnected from the brain regions that are needed to extract the meaning of the words they see.

Lesion Analysis

Much as Broca did so long ago, one way that experimental neuropsychologists today still study localization of function is by observing the results of brain damage. This activity is sometimes called *lesion analysis* (Aharonov et al., 2003). To get an idea of how lesion analysis works, suppose that a man with normal mathematical ability has a stroke that damages an area of his left parietal lobe (see Figure 3.10 in the chapter on biological aspects of psychology for the location of this area). Afterward, like other people with similar brain damage, he can no longer do math. Do these observations require us to decide that math ability is localized in the left parietal lobe? Not necessarily. Critical thinking gives other possibilities too.

For example, we have already seen that complex psychological functions often require cooperation of many modules in different brain areas. So although mathematical ability may suffer after damage to the left parietal lobe, it may also be affected by damage to other regions in a “mathematics” network. Experimental neuropsychologists explore this possibility by studying the changes in math ability seen in large numbers of people with damage to different brain regions. If they find that math ability is affected by left parietal lobe damage but nowhere else, they would be more confident in asserting that mathematical disability is localized in that area. If they find that damage in other areas also affects math ability, they would realize that this ability may depend on a widely distributed set of brain areas.

Neuropsychologists can also learn how people function when a brain area stops working for reasons other than from a brain area being destroyed. It is now possible to “shut off” a brain area using a technique called *transcranial magnetic stimulation (TMS)* (Dayan et al., 2013). In this procedure, a powerful magnet is held at a specified area of a person's head, and after adjusting certain parameters, specific areas of the brain's cortex can be inactivated

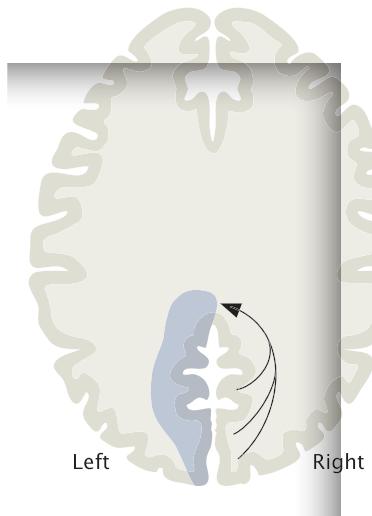


FIGURE 18.2
Alexia without Agraphia

This is a classic example of a disconnection syndrome. Brain damage (in darker blue) has occurred in the left occipital lobe and part of the corpus callosum. As a result, no visual information can enter the left hemisphere. The left-hemisphere brain regions that create writing are intact, so the patient can write. But because feedback from the visual system cannot get back to the language-processing systems of the left hemisphere, the patient cannot read what he or she has written.

for a time. In this way, a brain module can be reversibly taken out of the networks in which it participates. By observing how a person behaves during the time that TMS has created temporary dysfunction of specific brain modules, experimental neuropsychologist can in effect perform a kind of “reversible” lesion analysis (Sternberg, 2011).

But lesion analysis must also clarify just what function it is that has been damaged. For example, doing a mathematical calculation might require you to use several abilities, such as recognizing numbers and symbols, remembering the rules of addition or multiplication, keeping many numbers in your head as you do calculations, and being able to read or hear a math problem and report your answer. So if a brain lesion makes it hard for you to talk, you would not be able to answer the question “How much is 2 plus 2?” But this may not mean that there is anything wrong with your mathematical ability.

To help figure out exactly what problems a brain-damaged patient actually has, experimental neuropsychologists look at a complex mental task, such as reading or doing math, and—in light of research from sensation, perception, and cognitive psychology—try to identify all the abilities that a person’s brain must combine to succeed at that task. They then try to determine which of these abilities are actually separate, or *dissociated*, perhaps because they are based on using different brain modules in particular brain regions. One way to establish a dissociation between abilities is to study which components of a mental task are affected by which kinds of brain damage. An important example of dissociated abilities is described in the chapter on biological aspects of psychology. Damage to a particular area in the left frontal lobe disrupts a person’s ability to speak fluently but leaves the person able to understand most of what others say (remember Broca’s patient, “Tan”?). Damage to a different area in the left temporal lobe does the opposite, leaving the person able to speak easily but unable to understand what others are saying. We will discuss these conditions again later in this chapter. (“In Review: Foundations of Neuropsychology” summarizes milestones in the history of neuropsychology.)

IN REVIEW

FOUNDATIONS OF NEUROPSYCHOLOGY

Principle	Main Figure or Era	Key Ideas
Localization of function	Franz Gall, early 1800s Paul Broca, mid-1800s	The idea that a specific psychological function could depend on a specific brain area
Modularity	Late 1900s	A revision of localization in which each brain area performs different, unique computations, which contribute to various psychological functions
Networks	Late 1900s	A perspective suggesting that different complex psychological functions rely on unique combinations of brain modules
Lesion analysis	1800s to the present	An approach to experimental neuropsychology in which psychological functions are linked to particular brain areas by studying patients with damage to those areas and comparing these people with people who have damage elsewhere or no damage

1. A person who studies individual patients to determine what kind of brain damage each one happens to have is called a _____.

2. The case of “Tan” helped establish the principle of _____.

3. In alexia without agraphia, the brain areas that control reading and writing are intact but cannot interact. This condition is called a _____.

Neuropsychological Assessment

So far we have discussed how the brain is organized and how neuropsychologists study ways in which its functioning is related to behavior and behavior problems. Let's now consider how they decide when a person has such problems. Consider memory, for example. Everyone forgets things sometimes, even such familiar things as the name of your roommate's brother or where you left your car keys. But how much forgetfulness is normal and how much does it take to be labeled as excessive or problematic?

LINKAGES What psychological tests are used in diagnosing neuropsychological disorders? (a link to Intelligence)

To answer this question, neuropsychologists typically conduct a **neuropsychological assessment** by giving patients a large number of tests designed to measure a wide range of mental functions, such as general intelligence, memory, reading, motor coordination, naming pictures, and finding targets in a visual display. Some neuropsychologists prefer to use an individualized set of assessments uniquely tailored to each patient (Blakesley et al., 2009). In this way, they hope to measure the specific problems that a particular patient is most likely to have. Another approach is to give patients a standardized test battery, a pre-determined set of tests that are designed to complement one another and comprehensively address all aspects of psychological functioning (Kane, 1991). Many such test batteries have been carefully prepared and validated. Among the best-known examples are the Halstead-Reitan Battery, the Wechsler Adult Intelligence Scale, and the Luria-Nebraska Neuropsychology Battery. Standardized batteries offer the advantage of giving each patient the same tests in the same way, but they don't allow the neuropsychologist to tailor testing to focus on a patient's particular problems or unique situation. Accordingly, most clinical neuropsychologists start with a standard test battery and then administer additional tests that are particularly relevant to each case.

By giving a variety of tests, a clinical neuropsychologist can study many different areas of a person's psychological functioning and also measure each area separately. Analyzing the overall pattern of results may help pinpoint where the brain difficulties lie. But results of neuropsychological testing, like those of personality testing, intelligence testing, and academic testing, must be interpreted with caution. Many factors, such as age, education, and cultural background, can affect a person's performance on neuropsychological tests. With this in mind, each patient's performance on these tests must be compared with established averages, or norms. These norms may be based on test performance of large numbers of people of the patient's own age, educational level, and cultural background but who have no known brain damage. Norms also give clinical neuropsychologists an idea of how often normal people's scores vary from the average and by how much. Having this information helps establish whether a score that looks deviant at first glance is actually as unusual as it seems. Norms can also reveal when what seems like a minor deficit is actually quite unusual and indicative of a potential problem.

MECHANISMS OF BRAIN DYSFUNCTION

What are the main causes of brain damage or dysfunction?

We have been talking a lot about brain damage, so you may wonder how brains get hurt.

Cerebral Infarcts

Strokes, also known as cerebral infarcts, are a common source of brain damage. The brain receives all the oxygen, sugar (glucose), and other nutrients it needs from the rich supply of blood flowing through it (see Figure 18.3). But brain cells cannot store much of this energy, so they must have a supply of fresh blood at all times (Acker & Acker, 2004). If a vessel bringing blood into some part of the brain becomes blocked, the brain tissue in that part of the brain will die, and that is called a cerebral infarct. When someone's behavior or mental processes are affected by a cerebral infarct, that person is said to have had a stroke, sometimes also called a *cerebrovascular accident* (CVA). Even very tiny strokes can cause disabling symptoms if they take place in vital brain areas, but cerebral infarcts in less vital areas may cause few, if any, symptoms.

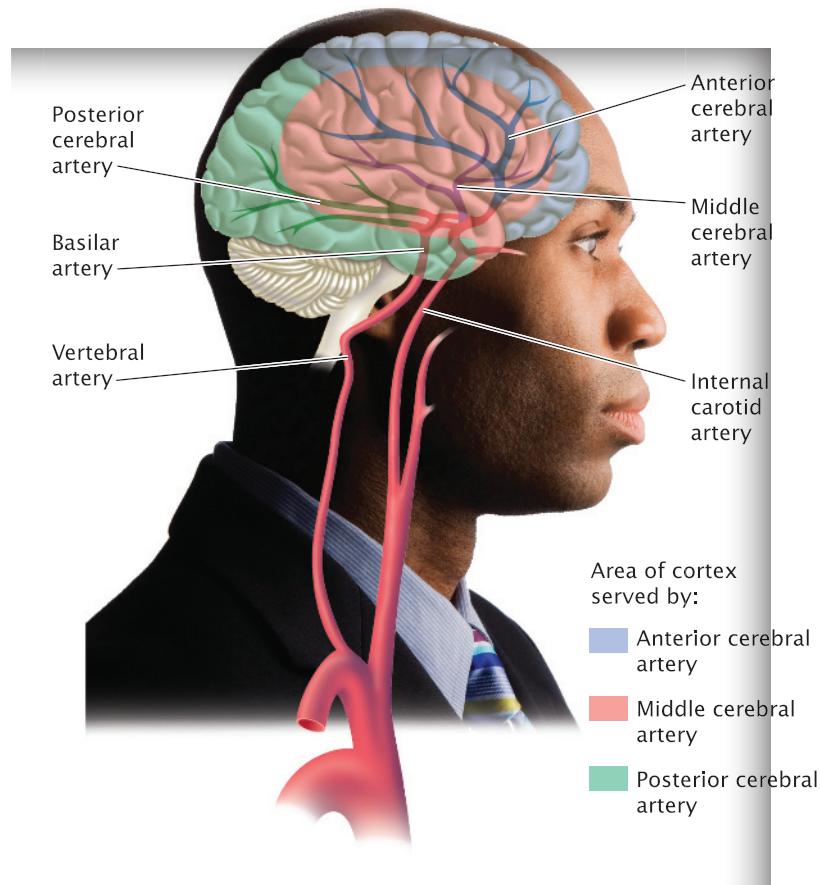
neuropsychological assessment

Testing a patient's intelligence, memory, reading, motor coordination, and other cognitive and sensory functions in an effort to locate problems in the brain responsible for neuropsychological symptoms.

FIGURE 18.3**The Brain's Blood Supply**

TRY THIS Blood reaches the brain either through the carotid arteries on either side of the neck or through vertebral arteries entering through the base of the skull. Once in the brain, these arteries branch into the anterior cerebral artery, the middle cerebral artery, and the posterior cerebral artery. Each artery provides blood to specific brain areas. As a result, a blockage in each particular blood vessel damages a specific, predictable part of the brain. Review the chapter on biological aspects of psychology to remind yourself of what functions are associated with each area of the cerebral cortex. Then make a list of the functions that would most likely be affected by blockage in each of the arteries shown in this figure.

Jupiterimages/Photos.com



Strokes can be quite dangerous. In fact, stroke is the fourth leading cause of death in the United States (Towfighi & Saver, 2011). They tend to occur as people get older, but even children can have them (Katsetos, Smith, & Scott, 2009). Unlike heart attacks, in which blood flow to the heart muscle is disrupted, a stroke usually involves little or no pain because there are no pain receptors in brain tissue. So a stroke victim may not immediately realize that anything is wrong (Jenkinson, Preston, & Ellis, 2011). The resulting delay in seeking medical attention can be costly, because treatments that can reverse the effects of a stroke must be used as soon as possible (Kurz, Kurz, & Farbu, 2013).

Like explosions that break windows a block away, strokes affect not only the area in which brain tissue has died but also the surrounding area. Fortunately, if cells in the area around a stroke have not actually died, they may start working again (Rosso & Samson, 2013), allowing people to recover all or part of their lost functions. The amount of recovery depends on many factors, including the quality and speed of medical treatment, how large the stroke is and where it is located, the health of the remaining blood vessels and brain tissue, the quantity of salvageable tissue, the degree to which the remaining nervous system can reorganize along its original lines, and the kinds of rehabilitation programs undertaken after the stroke (Heiss, 2012; Rosso & Samson, 2013). To help the brain heal itself, some scientists are experimenting with chemicals that stimulate existing cells and blood vessels to grow (Yu et al., 2012); others are inserting stem cells into the brain to replace damaged tissue (Gutiérrez-Fernández, 2013). Electrical brain stimulation is also being studied as a way to enhance stroke recovery (Sandrini & Cohen, 2013). As described in the chapter on biological aspects of psychology, though, restoring functions lost to a stroke takes more than just restoring cells in damaged brain areas. The new cells must also somehow reestablish the right connections with other brain cells (Kalluri & Dempsey, 2008; Liu et al., 2009).

Traumatic Brain Injury in Sports

Traumatic brain injuries known as *concussions* are a risk in football and other contact sports (Gilchrist et al., 2011; Hamalainen, 2012; O'Rourke, 2011). The short-term effects of a concussion may include nausea, confusion, and problems with vision and memory. The long-term effects can be even more problematic (DeKosky, Ikonomovic, & Gandy, 2010). Some players develop symptoms similar to those of Alzheimer's disease (Hamalainen, 2012). Others suffer depression, and some develop a form of amyotrophic lateral sclerosis, or Lou Gehrig's disease (Bartholet, 2012). There is hope that better helmets and more restrictive rules about helmet-to-helmet contact will reduce the number of concussions among football players at every level, from high school to the NFL.

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Traumatic Brain Injury

Another major cause of brain damage is **traumatic brain injury (trauma)** (Heegaard, 2007). Trauma creates an impact on the brain, such as when a person's head is struck by something or when the head moves suddenly or is thrown violently against some object. Traumatic events such as these can cause damage because the brain is not firmly attached to the skull. Instead, it floats within it, suspended in a bath of **cerebrospinal fluid**. So when the head violently accelerates or decelerates, the soft globe of brain bounces back and forth inside the skull, bumping up against bone and causing nerve fibers in many areas to stretch and tear (Meaney & Smith, 2011).

The amount of brain damage resulting from trauma depends greatly on the amount of force involved in such situations and whether repeated brain traumas occur (Mannix et al., 2013). Further, unlike in strokes, where only the area in or near a disrupted blood supply is likely to be affected, the damage and disruption caused by trauma may be widespread. So whereas stroke patients may show very specific kinds of neuropsychological deficits, sometimes with striking dissociations between functions that are lost and those that are preserved, people with head injuries may show deficits that are far more diffuse, harder to specify, and involve many aspects of functioning (Wade, 2004), including cognitive and psychiatric problems (Stern et al., 2011; Whyte et al., 2011). This may explain why we know much more about the neuropsychological symptom patterns that follow strokes than we do about those following brain traumas. Greater attention has been paid lately to the hypothesis that repeated brain traumas in sports concussions may lead to progressive cognitive decline that worsen after the brain injuries (Noble & Hesdorffer, 2013), a condition known in the early 20th century as *dementia pugilistica* and now more commonly called *chronic traumatic encephalopathy* (CTE) (Levin & Bhardwaj, 2013). Recovery from traumatic brain injury is more likely in people who had completed more education prior to their injury, but it is not yet clear why this is so (Schneider et al., 2014).

traumatic brain injury (trauma)

An impact on the brain caused by a blow or a sudden, violent movement of the head.

cerebrospinal fluid A clear liquid that surrounds and buffers the brain against vibration.

neurodegenerative diseases Conditions in the brain that result in a gradual loss of nerve cells and of the cognitive or other functions in which those cells are normally involved.

Neurodegenerative Diseases

Unlike the sudden symptoms that result from brain damage caused by stroke, other brain problems develop gradually. One way that slowly developing symptoms may appear is with **neurodegenerative diseases**, processes that gradually damage brain cells

over longer periods of time (Mayeux, 2003). Three of the most prominent examples of neurodegenerative diseases are Alzheimer's disease, Parkinson's disease, and frontotemporal degeneration. Each type of neurodegenerative disease affects a particular kind of brain cell or cells in a particular area of the brain, causing them to be the first to stop working properly (Cummings, 2003) and leaving the victim without the mental or physical functions those cells had once supported. The pattern of symptoms resulting from each neurodegenerative disease is different enough that neuropsychological assessment of a patient can lead to a diagnosis of which disease is affecting that patient (Brun, 2007; Miller, 2007).

Some kinds of neurodegeneration appear to be caused by infections, nutritional deficiencies, or genetic abnormalities, but despite intense research, we are still not sure about the specific causes of most such diseases. ("In Review: Mechanisms of Brain Dysfunction" summarizes the major causes of brain injury and dysfunction.)

IN REVIEW			
MECHANISMS OF BRAIN DYSFUNCTION			
Brain Problem	Onset	Underlying Process	Symptoms
Cerebral infarct (stroke)	Sudden	Blood flow is blocked in some part of the brain.	Specific to the area of the brain that is destroyed
Traumatic brain injury (trauma)	Sudden	Brain moves back and forth inside the skull.	Often nonspecific, diffuse
Neurodegenerative disease (neurodegeneration)	Gradual	A subset of neuron cell types becomes diseased and stops working properly.	Specific to the types of brain cells affected

1. The brain floats in a bath of _____ inside the skull.
 2. The brain needs a constant flow of fresh _____ at all times.
 3. Strokes rank as the number _____ cause of death in the United States.

NEUROPSYCHOLOGICAL DISORDERS

What disorders can be caused by brain damage or dysfunction?

Let's now take a closer look at the **syndromes**, or patterns of symptoms, that clinical neuropsychologists often see in patients after a stroke, trauma, or neurodegenerative disease. These syndromes are referred to as *neuropsychological disorders* and include amnestic disorders, consciousness disturbances, perceptual disturbances, disorders of language and communication, disorders of movement, and disorders involving dementia.

LINKAGES What disorders are caused by damage to brain areas involved in memory? (a link to Memory)

syndrome A pattern of symptoms associated with a specific disorder.

amnestic disorders Neuropsychological disorders that involve memory loss.

Amnestic Disorders

Amnestic disorders involve memory loss (often called *amnesia*). Concerns about memory often bring people to clinical neuropsychologists for evaluation. These people are concerned partly because they rely heavily on memory, so any threat to its integrity can be very upsetting. But patients also tend to focus on memory problems because we have a tendency to interpret almost any psychological deficit as being related to memory (Lezak, Loring, & Howieson, 2004). As in Max's case, for example, people who develop trouble naming objects may say they are "forgetting" words, even though the problem

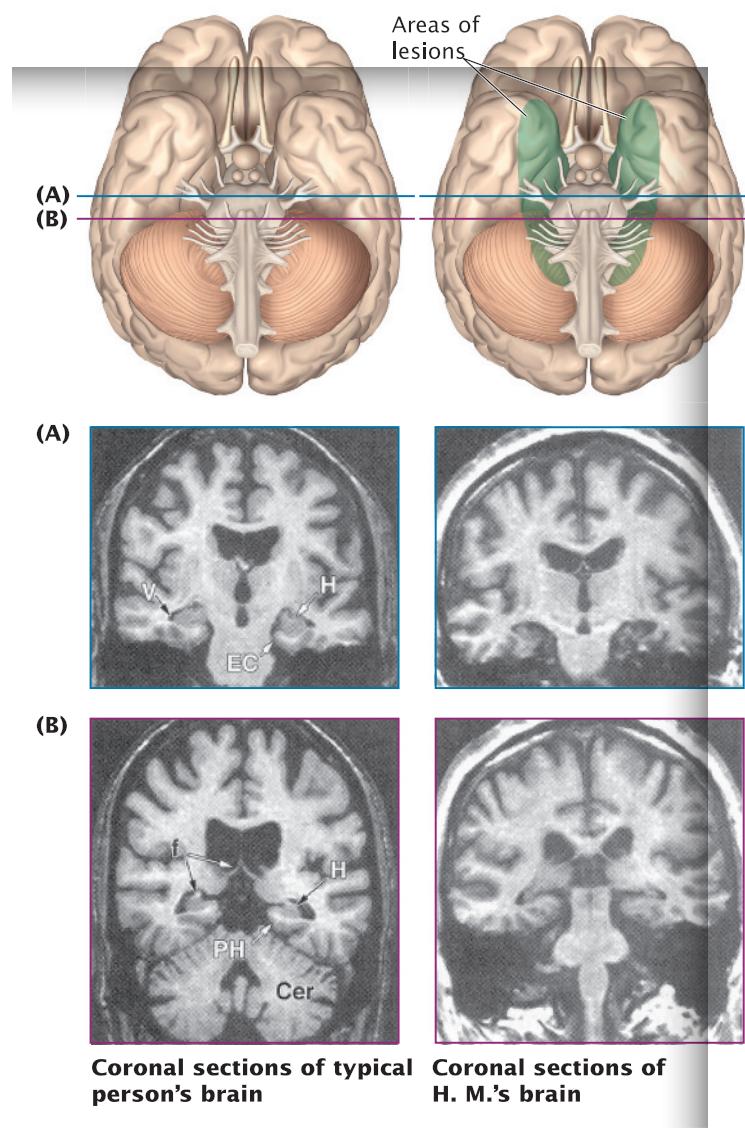
might actually be one of language or visual recognition. Many older individuals, too, seek neuropsychological assessment because of worry that even minor forgetfulness might be an early sign of Alzheimer's disease. We discuss this disease in the section on dementia, but memory loss can occur in other neuropsychological syndromes too (Lucas, 2005).

For example, the ability to create new long-term memories can be impaired by damage in the brain's medial temporal lobes ("medial" means toward the middle of the brain), especially in the hippocampus (Ando et al., 2008; de Haan et al., 2006; Rosenbaum et al., 2008). Consider the famous case of Henry Molaison, known for much of his life as patient H.M. to protect his identity (Scoville & Milner, 1957). In 1953, as a twenty-seven-year-old man, his epilepsy was so severe that he had brain surgery in an effort to stop his seizures. The surgery removed parts of both his left and right temporal lobes, including parts of the hippocampus on both sides. This radical treatment helped control his seizures, but it left H.M. with a dense amnestic syndrome that persisted until he died at age of eighty-two in 2008 (Squire, 2009; see Figure 18.4). Although he was able to recall most details of his life from before the surgery, after surgery he had difficulty forming new memories. In other words, as discussed in the memory chapter, he had **anterograde amnesia**. When he met someone new, he was unable

FIGURE 18.4
H. M.'s Brain Surgery

H. M. underwent surgery that removed the hippocampus, the amygdala, and part of the association cortex from both temporal lobes. As shown in these MRI scans comparing an intact brain with H. M.'s brain after surgery, H. M. had some hippocampus (H) but no entorhinal cortex (EC). In this image, (V) refers to the lateral ventricle, (f) refers to the fornix, (PH) refers to the parahippocampal cortex, and (Cer) refers to the cerebellum.

Courtesy Dr. Suzanne Corkin, Massachusetts Institute of Technology. Copyright © 1997 Society for Neuroscience. *J. Neurosci.*, May 15, 1997, 17(10):3964-3979



anterograde amnesia A loss of memory for events that occur after a brain injury.



FIGURE 18.5
Memory without Awareness

People with amnesia from medial temporal lobe damage may still learn from the experiences that they otherwise cannot recall. This stimulus shows a degraded version of a drawing. Using stimuli similar to these, participants with amnesia first saw a very degraded version, then one less so, then less, and so on until they could name the item. Patients with amnesia were able to name items earlier if they had seen them before, even when they could not recall having seen them.

Source: From Snodgrass, J. G., and Feenan, K. "Priming effects in picture fragment completion: support for the perceptual closure hypothesis." *Journal of Experimental Psychology: General* vol. 119 (p.280).

Korsakoff's syndrome An amnesic condition in people whose thiamine (vitamin B1) level is depleted by inadequate nutrition or alcoholism.

confabulation A characteristic of some neuropsychological disorders in which patients report false memories.

to recall the meeting moments later, so the person seemed to be a stranger no matter how many times they met again. Similarly, new words he heard over the years—such as *computer*, *video*, *cell phone*, and *Jacuzzi*—never made it into his vocabulary. He wasn't even able to remember that time was passing, so he had few clues that he was getting older; to a great extent, he was mentally stuck in the 1950s.

Many of H.M.'s other mental capacities remained largely intact, however, providing a striking example of the dissociation that can occur between abilities lost and those spared after brain damage. He had good language function; he recognized objects; he thought and reasoned; he remained intelligent, pleasant, and sociable; and he carried on very normal-sounding conversations. Yet, he was quite aware of his memory problem. He put it as follows: "Right now, I'm wondering, have I done or said something amiss? You see, at this moment everything looks clear to me, but what happened just before? That's what worries me. It's like waking from a dream. I just don't remember" (Milner, 1970, p. 37).

H.M. was carefully studied for years, and the lessons learned from him prompted research on memory loss in other people after medial temporal lobe damage. When other people have amnesia caused by damage to the hippocampus, just like H.M., they also have difficulty remembering the new experiences or events of their lives. But also like H.M., it turns out that these individuals can still learn new skills and habits as a result of their new experiences. When they do a task over and over, they get better at it, meaning that they do form some kind of a memory. Nonetheless, they have no awareness of this learning and do not recall the experiences that led to it (see Figure 18.5).

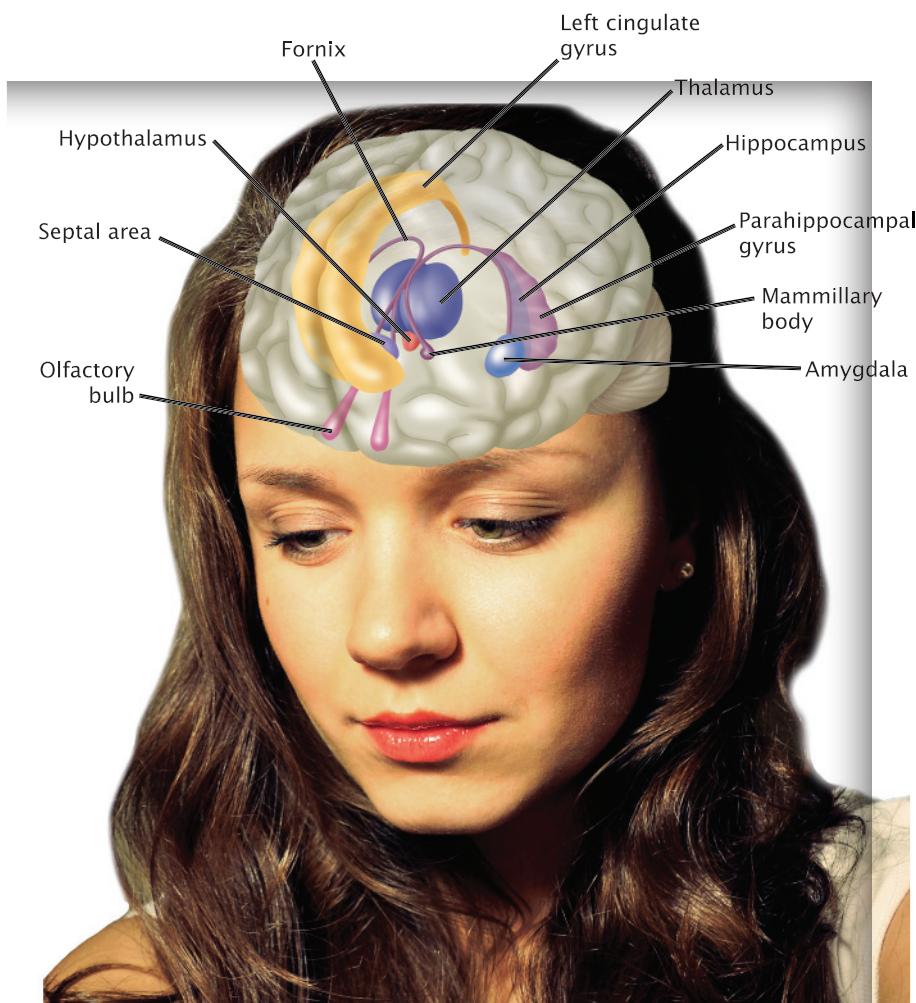
Anterograde amnesia and other amnestic syndromes can be caused by events other than surgery in the hippocampus and medial temporal lobe. For example, certain brain infections, such as herpes encephalitis, tend to damage these same parts of the brain and create an amnestic syndrome similar to that of H.M. (Ando et al., 2008; Baringer, 2008). Strokes, too, can sometimes damage these regions, though they are usually on just one side of the brain, so the amnestic syndrome is less often seen. Finally, as described later, these regions, and the memory functions they normally perform, can also be impaired by Alzheimer's disease (Colliott, Hamelin, & Sarazin, 2013).

The hippocampus is not the only brain area involved in memory. For example, as described in the chapter on biological aspects of psychology, the thalamus processes information from all the senses except smell and sends it on to the cerebral cortex for more analysis. But some parts of the thalamus are also part of the brain's *limbic system*, an interconnected set of structures that includes the hippocampus (see Figure 18.6). When strokes in the thalamus damage their limbic connections, memory loss can occur (Pergola et al. 2012). One part of the thalamus, the medial dorsal (middle and top) thalamus, is damaged when people have **Korsakoff's syndrome** (Butters, 1981), a condition in people whose thiamine (vitamin B1) is depleted by poor nutrition or alcoholism. Running low on thiamine is dangerous because this vitamin is needed to process glucose (sugar) for energy. Nerve cells of the medial dorsal thalamus are especially dependent on this function of thiamine (Marti, Singleton, & Hiller-Sturmhofel, 2003), so if thiamine deficiency is severe, nerve cells there are more likely to die than in other brain regions (Hazell et al., 2013). The result is anterograde amnesia, plus an added unusual feature: **confabulation**, or the creation of false memories, both spontaneously and in response to questions (Borsutzky et al., 2008; Butters, 1981). These individuals believe that they have had experiences that they have not actually had, and they "recall" them as if they were real. Research with other confabulating patients suggests that this condition may also occur following damage to certain prefrontal brain regions (Nieuwenhuis & Takashima, 2011). Other amnestic syndromes do not usually produce confabulation, so when clinical neuropsychologists test patients with severe anterograde amnesia and find confabulation too, they may suspect medial dorsal thalamic amnesia or prefrontal amnesia.

FIGURE 18.6
The Limbic System

A number of closely connected structures form the limbic system, which controls many aspects of motivation and emotion.

Monika Getty/Moment Open/Getty Images



Consciousness Disturbances

Sometimes brain problems cause **consciousness disturbances**, impairing a person's awareness of the world around them (Bruno et al., 2011). One such problem occurs when there is disruption or damage to the **reticular formation**, also known as the *reticular activating system (RAS)*. The RAS is a long, tubelike structure stretching from the base of the brain upward, eventually splitting into both sides of the thalamus. As its name implies, the RAS normally serves to increase and decrease arousal in the rest of the brain and is partly responsible for our daily cycles of wakefulness and sleep (Yeo, Chang, & Jang, 2013). If the RAS is severely damaged, the result can be an unconscious state known as a *coma*. People with lesser amounts of RAS damage may enter a *persistent vegetative state (PVS)* or a *minimally conscious state (MCS)* (Gosseries et al., 2011). Unlike patients in comas, people in a PVS or MCS may open their eyes and appear to wake up in the day and close their eyes and appear to sleep at night. They may also show more automatic movements than coma patients. For example, when food is put in the mouth of someone in a PVS or MCS, chewing movements may occur, and sounds and touches may trigger facial expressions. But though EEG and brain PET scans sometimes show isolated activity in some areas of these individuals' brains—including activity in response to familiar sounds (Cruse et al., 2011; Heiss, 2012)—most patients seem unaware or poorly aware of their environment. The chances for recovery are often poor after significant RAS damage.

consciousness disturbances

Neuropsychological disorders in which there are impairments in the ability to be aware of the world.

reticular formation A collection of cells and fibers in the hindbrain and midbrain that are involved in arousal and attention.

Even if the RAS is working properly to stimulate the rest of the brain, consciousness can be impaired if there are widespread disruptions in the functioning of both sides of the cerebral cortex, where other aspects of awareness are controlled (Stevens & Bhardwaj, 2006). Impairment of both sides of the cortex is most commonly caused by drugs such as alcohol or sleeping pills, but other causes include fever, seizures, chemical imbalances in the blood, hormonal disorders, and infections that have spread to the blood (Posner et al., 2007).

Other disturbances of consciousness have more complex and changing effects. People with **delirium**, for example, alternate between abnormally reduced and abnormally elevated levels of consciousness (Gofton, 2011). These patients may appear sleepy and “out of it” one minute and then far too attentive the next, as shown by reactions to any little sight and sound. Impairments often also appear in many mental functions, usually including poor attention, poor memory, and disorientation. People with delirium may experience hallucinations (hearing sounds or seeing things that are not really there) or agitation for no clear reason. Common causes of delirium include fever, poisons, infections affecting the bloodstream, and medication side effects. Delirium may signal a medical emergency, but usually its psychological effects go away when the underlying medical cause is corrected or ends on its own (Skrobik, 2009).

Neuropsychological testing of people in delirium is difficult (Milisen et al., 2006). Their attention and awareness can vary, sometimes dramatically, during testing. In general, performance on almost any test is very poor, probably because patients with delirium cannot pay attention well enough to cooperate with the testing process. Indeed, their typical pattern of performance on neuropsychological tests is that there is no pattern—everything may look impaired.

Still other consciousness disturbances involve problems not in people’s level of consciousness but in the nature or content of their consciousness. For example, a person may have a stroke that causes total paralysis of one side of the body, but the person may not know that they cannot move (Vocat, Saj, & Vuilleumier, 2013). This condition is called *anosognosia* (pronounced “an-oh-sug-NOH-zhuh”), which means an absence of knowledge of disease (Long, Reger, & Adams, 2013). In such cases, brain damage not only impairs functioning but also decreases the ability to know about the impairment. This makes sense because the brain is the organ that we use to figure out when something is wrong. So if you have pain in your arm, sensory neurons tell the brain about it. But if the brain itself is hurt, it has nowhere to send its message!

People can have anosognosia for a variety of problems, from paralysis to blindness to amputation of a limb (McGlynn & Schacter, 1989). It is also sometimes seen in association with neurodegenerative dementias (Morris & Mograbi, 2013). Anosognosia is more likely after damage to the right side of the brain (Vocat et al., 2010). Anosognosia is relatively common, occurring, for example, in more than 25 percent of all stroke cases (Starkstein et al., 1992). An unfortunate result is that these patients may not be motivated to get the prompt medical attention needed to limit the amount of damage that a stroke can cause. Anosognosia usually fades over time, but when it does persist, it impairs patients’ cooperation with rehabilitative treatments. They don’t recognize that something is wrong, so they don’t understand why treatment is necessary. Also, many doctors do not know about anosognosia, so they may fail to diagnose a problem since the patient does not complain about anything (Fowler et al., 2013). There may be ways to improve awareness of neurological deficits, though. In one case, a man was unaware of the sudden and bizarre involuntary movements he had been making for several years. He could not see these movements, even when looking at himself in a mirror, but when he watched himself on videotape, he instantly saw the problem (Shenker et al., 2004).

delirium Periods of abnormally impaired or abnormally elevated levels of consciousness.

THINKING CRITICALLY

CAN SOMEONE BE PARTIALLY PARALYZED AND NOT KNOW IT?

In anosognosia, a person denies a neurological deficit because she or he does not know that a problem exists. This phenomenon was first described long ago in strokes that caused *hemiparesis*, a weakness or partial paralysis affecting just one side of the body (Babinski, 1914). Skeptics argue that people with hemiparesis are still fully capable of knowing that they are partially paralyzed but that this knowledge would be so upsetting that they simply cannot admit it, even to themselves. According to this argument, anosognosia is not true unawareness but an unconscious mental process similar to the ego defense mechanism that Freud called *denial* (see the chapter on personality).

What am I being asked to believe or accept?

Arguing against these skeptics are those who say that anosognosia occurs because the brain damage that causes hemiparesis also damages the brain areas that are needed to know that something is wrong. As a result, patients who seem unaware of hemiparesis or other problems are, in fact, truly unaware of them (Heilman, Barrett, & Adair, 1998; McGlynn & Schacter, 1989).

What evidence is available to support the assertion?

Those who believe that anosognosia is genuine unawareness argue that if it were due to an ego defense mechanism, patients should deny any and all potentially upsetting deficits. Yet evidence shows that some hemiparesis patients, for example, are aware that an arm is weak but not that a leg is weak (Berti, Ladavas, & Corti, 1996; Bisiach et al., 1986). Others are aware that they have a speech problem but not limb weakness (Bisiach et al., 1986; Breier et al., 1995), and some are aware of blindness but unaware of limb paralysis (Prigatano et al., 2011).

Another problem with the ego defense mechanism argument is that anosognosia occurs more often after right-sided brain damage, which causes left hemiparesis, than it does after left-sided brain damage causes right hemiparesis. Weakness on either side should be upsetting and both should cause anosognosia by the denial hypothesis. In fact, because most people are right-handed, weakness on the right side of the body might be even more upsetting and so more likely to result in psychologically motivated denial.

Additional evidence against the ego defense mechanism hypothesis comes from finding that anosognosia can occur even when there is no threat of permanent paralysis. In a procedure pioneered by June Wada (Strauss & Wada, 1983), patients being evaluated for possible brain surgery had an anesthetic injected into one side of the brain at a time (Adair et al., 1995; Gilmore et al., 1992). This *Wada test* temporarily “turns off” either the brain’s left hemisphere or the right hemisphere but causes no brain damage. When the right hemisphere was “turned off” in this way, participants became paralyzed in the left arm and leg. When asked about their experience, they recalled most details correctly, but most of them showed anosognosia—that is, they said that they did not notice any weakness. When the left hemisphere was anesthetized, though, the patients not only became weak on the right side but also later reported awareness of it. These data are hard to explain due to ego defense mechanisms because once participants had recovered from their left-side paralysis, why would they be motivated to deny that it had occurred?

Are there alternative ways of interpreting the evidence?

A problem with the Wada test is that it is difficult to compare patient experiences during left-versus right-brain anesthesia. The reason is that speech areas are on the left side of the brain, so people are usually unable to speak when their left hemisphere is “turned off.” However, this doesn’t happen on the right side. The only way to do a direct comparison of the experience of left- versus right-hemisphere inactivation is to ask questions after the anesthetic has worn off. If it were possible for patients to talk during the left-hemisphere inactivation, perhaps they would show anosognosia because at that particular moment, there could be enough distress to motivate denial.

(continued)

The psychological denial interpretation is supported by research decades ago in patients who had a stroke causing hemiparesis (Weinstein & Kahn, 1955). When their families were interviewed, those patients who, before their stroke, had tended to cope with stress through denial were also the ones most likely to deny their hemiparesis. Patients who did not show anosognosia were described by their families as less likely to have previously used denial as a coping strategy. These data implied that denial of hemiparesis could be an exaggeration of one's typical stress-coping tendencies. Also, patients who denying weakness sometimes show implicit awareness of it, such as changing the way they walk after one leg becomes weak (Fotopoulos et al., 2010). Some argue from such an observation that, at some level, such patients actually "know" they are weak, even if it is not conscious.

What additional evidence would help evaluate the alternatives?

The results of family report studies might be affected by *retrospective bias*. That is, if family members know that their relative is denying hemiparesis, they might more often recall similar episodes of denial in the relative's past and forget about when the patient coped with stress in other ways.

One way around the problem of retrospective bias would be to do a *prospective study* in which a large group of individuals is identified, their typical stress-coping tendencies are assessed, and then they are contacted on a regular basis for many years. The ego defense mechanism hypothesis would be supported in such a study if the people in the group who were most likely to use denial as a coping mechanism are also the ones most likely to display anosognosia following a stroke.

Implicit "awareness" of deficits may not necessarily mean that psychological denial is otherwise preventing "explicit awareness" in anosognosia patients. Instead, such observations may merely be another example of how, as described in the consciousness chapter, some of the brain systems that monitor body functions operate outside of our awareness (Prigatano 2013).

What conclusions are most reasonable?

Some individuals who suffer neurological deficits probably do use denial or other psychological defense mechanisms to avoid facing distress, but the evidence best argues that most cases of anosognosia reflect a true lack of awareness of neurological deficit.

Perceptual Disturbances

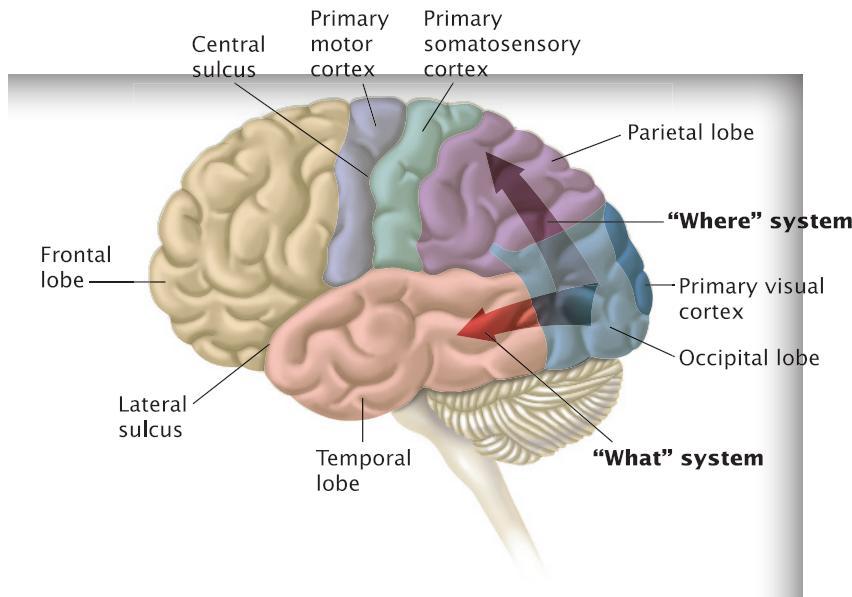
As described in the chapter on sensation and perception, the brain must organize, recognize, and interpret the information we receive from our eyes, ears, and other senses if we are to make sense of the world. These vital perceptual functions depend on the normal operation of specific brain areas. For example, visual information from the eyes goes to the thalamus and is then analyzed further in the cerebral cortex of the occipital lobe. From there, visual information is sent along two pathways. Along each of these pathways are a series of connected cortical regions that do more specialized analyses, giving us different aspects of visual perception (Ungerleider & Mishkin, 1982; see Figure 18.7). The pathway leading down toward the temporal lobe has been called the "what" system because the brain activity along this pathway helps us decide what we see—a dog or a car, for example. The pathway going up toward the parietal lobe has been called the "where" system because it analyzes object location and where objects are in relation to one another. This system helps us understand, for example, that the dog is sitting inside a car. Damage to our perceptual systems can result in **perceptual disturbances**.

For example, damage to the "what" pathway can cause *visual agnosia* (Barton, 2011). As in the case of Max, individuals with visual agnosia may see objects in the world, describe them, and even draw them, but they cannot use their vision to identify what they see (Rubens & Benson, 1971). So such a patient can correctly define the word *apple* and, based on how it feels, correctly state when one has been placed in their hand. In other

perceptual disturbances Neuropsychological disorders in which there are impairments in the ability to organize, recognize, interpret, and make sense of incoming sensory information.

FIGURE 18.7
"What" versus "Where"
Visual Pathways

Research suggests that visual information reaching the primary visual cortex is sent along two separate but parallel systems. The "where" system focuses on an object's location in space and how it is moving. The "what" system determines the identity of the object.



words, these patients still know what apples and other objects are, but they can no longer link visual images of these objects to the brain systems where that knowledge is stored.

Some visual agnosia patients cannot name anything they see. For others, the problem is only for categories of objects (Bauer & Demery, 2003). For example, some people appear to have visual agnosia only for manufactured objects, such as cars, books, or drinking glasses, but can still see and identify a tree, a dog, or any other living thing (Riddoch et al., 2008). In other cases, only manufactured objects can be named on sight (Riddoch et al., 2008; Thomas & Forde, 2006). Such observations suggest that recognition of natural versus manufactured objects must be based on different brain processing.

Visual agnosias can be even more specific. For example, there may be a brain system that is specialized for visual recognition of faces (Susilo et al., 2013). People with *prosopagnosia* (pronounced "proh-suh-pag-NOH-zhuh") can't recognize faces on sight, even very familiar ones, such as the patient's own face in a photo or mirror (Barton, 2011). Most people with prosopagnosia have damage to both temporal lobes of the brain (Valdés-Sosa et al., 2011), but sometimes, right-sided damage alone causes this syndrome (Gainotti, 2013). Interestingly, while prosopagnosia patients may not be able to say if a face is familiar or not, they still show changes in fMRI and EEG to faces of people they should know as compared to people they do not know, implying that recognition may still exist at a "covert" level (Simon et al., 2011).

In a different kind of face-related perceptual disturbance, people can recognize faces but they believe that a familiar person has been replaced by an "impostor." This false belief is known as *Capgras syndrome* (pronounced "KAHP-grah"), recognizing the French psychiatrist who first reported it (Capgras & Reboul-Lachaux, 1923). The damage seen in Capgras syndrome tends to be in the temporal lobes, disconnecting brain areas that help recognize faces from those that help us to have a sense of familiarity (Ramachandran, 1998). Capgras delusions are often permanent, but in at least one case they were cured by antiseizure medication (Shenker, 2013).

As you might expect, brain damage in the "where" system affects visual perception of the spatial location of objects and how they are related to one another. An interesting example is called *simultanagnosia* (pronounced "sih-MUL-tun-ag-NOH-zhuh") (Wolpert, 1924), wherein a person may see parts of a visual scene but not the whole scene. In a sense, a person with simultanagnosia sees the "trees" but not the "forest." So if such a patient saw the pattern in Figure 18.8, he or she could see all "Ts" but not the larger letter "H" formed by the smaller letters.

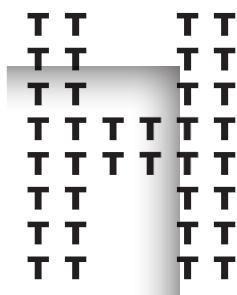


FIGURE 18.8
A "Global-Local" Stimulus

TRY THIS People with simultanagnosia have difficulty seeing an H in this stimulus but see the Ts easily. Try showing this pattern to several friends. Unless any of them are suffering a similar neuropsychological disorder, you should be able to confirm that they will report seeing both the little Ts and the larger letter H.

One patient described her perceptions as follows (Shenker, 2005):

Examiner: What do you see?

Patient: I see T, T, T, T, . . . Do I keep going?

Examiner: Anything else?

Patient: T, T, T, T, . . . lots of Ts.

Examiner: Are there any other letters?

Patient: No.

Examiner: Is there an H?

Patient: No, just Ts.

Examiner: Is there a big letter?

Patient: No, I don't see one.

Examiner: Is there a big letter H?

Patient: No.

Examiner: Do the little letters together form the shape of a big letter H?

Patient: I don't see how.

Examiner: (*outlines the H with finger*) Do you see how this is a big H?

Patient: I don't see an H.

Simultanagnosia is often caused by dysfunction in the brain's parietal lobes (Barton, 2011). Damage to parietal regions can also sometimes cause *hemineglect*. This condition involves difficulty in seeing, responding to, or acting on information coming from either the right or, more often, the left side of the world (Heilman, Watson, & Valenstein, 2003). The side of space that is neglected is usually opposite the side of parietal lobe damage. A person with hemineglect may ignore food on one side of a dinner plate, fail to put makeup on one side of the face, or pay no attention to voices on one side of the room. As shown in Figure 18.9, when asked to draw a picture of, say, a flower or a clock, only half a drawing may be completed.

Hemineglect cannot be simply a lack of sensory input from one side of space. For patients with left hemineglect, the very concept of "leftness" seems lost, and so the left side of the world gets ignored (Bisiach, Capitani, & Tansini, 1979). Such a process is easy to demonstrate in some patients. An examiner may hold up one hand on each side of a patient's visual field and ask the patient to say when fingers are wiggling. In many cases of hemineglect, patients may correctly report when fingers are seen moving on the right *or* on the left, as long as the wiggling is only on one side at a time. But when wiggling is on both sides, patients may see it only on the side they do not ignore. These cases show that some hemineglect patients can *see* both sides of space but are simply more likely to *attend* to one side. The tendency to do so can be reduced, though. In one study, patients were aware of the once-neglected side of space while listening to music evoking positive emotions (Soto et al., 2009). New techniques using electrical brain stimulation also may help (Müri et al., 2013).

Some patients with hemineglect also have sensory problems. They may be blind in their left visual field, for example. It may seem surprising, but we know that even in some of these patients, the tendency to ignore one side of space cannot be due to sensory loss. For example, patients with left hemineglect may not respond to the sound of a voice coming from the left. Is it because of a problem in their left ear? No, because sound is heard by both ears. Also, left hemineglect patients may ignore the left side of an object even if the entire object appears in their right visual field.

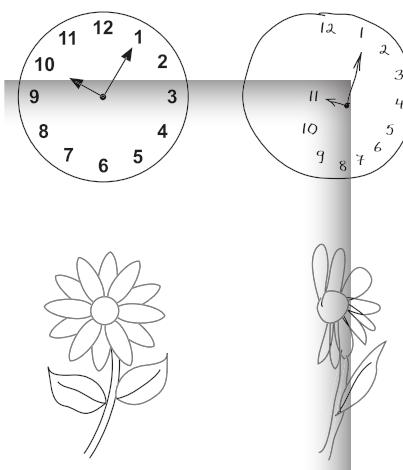


FIGURE 18.9
Examples of Neglect on a Drawing Test

When shown pictures like those at left and asked to draw them, patients with hemineglect often leave out details from the neglected side of the object.

FOCUS ON RESEARCH METHODS

STUDYING HEMINEGLECT

Showing that hemineglect is not explained by sensory problems alone can be tricky. After all, in many cases of hemineglect, the brain damage that caused it also caused a loss of sensation from the same side. Also, most tests for hemineglect rely on giving a person some kind of sensory information to respond to. How can one show that hemineglect is not due to a sensory problem if you can only test for it by having people respond to sensory inputs?

What was the researcher's question?

Edoardo Bisiach (Bisiach, Luzzatti, & Perani, 1979) reasoned that if hemineglect was truly a problem with understanding that a particular side of space exists, then this problem should persist even for a scene that exists only in one's imagination.

How did the researcher answer the question?

Bisiach tested patients who had right brain damage and left-sided hemineglect. He created shapes that looked a bit like clouds. The shapes passed behind a vertical slit so that as the image moved, patients could peak at only a small "slice" of it at a time (see Figure 18.10). So, the only way to see the whole shape was to imagine all the "slices" assembled in the mind's eye. Patients were shown two of these passing images at a time, one at the top part of the slit and the other at the bottom. Sometimes, the two shapes were identical; sometimes, their left sides were different, and sometimes, only their right sides were different. The patients had to decide whether the two shapes were same or different.

What did the researcher find?

Patients with left-sided hemineglect could say when the shapes were different if the right sides were mismatched, but not if the left sides were different.

What do the results mean?

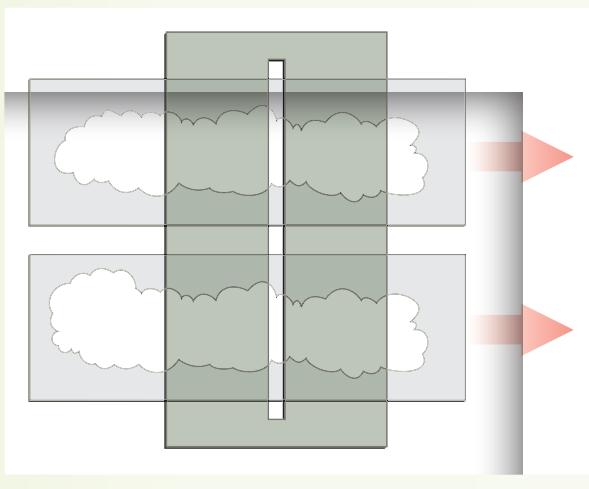
Because of the slit, the patients could not see the left and right sides of the images at the same time. So, their failure to notice differences on only the left side could not be from an inability to see the left side. Instead, these results mean that hemineglect occurred when patients ignored a particular side of space for an image assembled into imagery alone.

What do we still need to know?

Different kinds of hemineglect are produced by damage in different parts of the brain (Watson & Heilman, 1979). So it is not clear whether Bisiach's patients, who had parietal lobe damage, are representative of all hemineglect patients. Also, all Bisiach's cloud stimuli were visual. Would the same results appear in research using imagined touches or sounds, for example?

FIGURE 18.10
Studying Hemineglect

Here are examples similar to the cloud-like shapes used by Edoardo Bisiach and his colleagues (1979) to explore whether hemineglect is a sensory problem. Hemineglect patients could see only vertical slices of these shapes as the patterns passed behind a narrow vertical slit. So to "see" these shapes as whole patterns and to decide whether pairs of patterns were the same or different, they had to build an image of each pattern in their minds.



LINKAGES

LANGUAGE DISORDERS AND THE BRAIN

LINKAGES How does damage to the brain affect language abilities? (a link to Biological Aspects of Psychology)

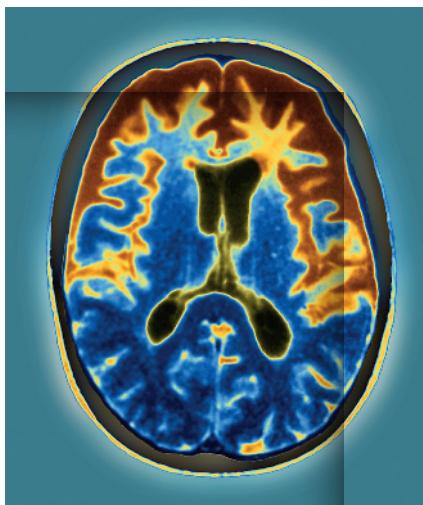


FIGURE 18.11
Frontotemporal Degeneration

In frontotemporal degeneration, a relatively limited part of the brain can become extremely shrunken, as shown here.

Zephyr/Science Source

Dysfunction of brain regions that normally support the ability to speak, read, write, and understand language causes **language disorders**, also called **aphasias** (pronounced “uh-FAY-zhuhs”). In this section, we discuss several subtypes of aphasias (Caplan, 2003a), each caused by dysfunction in different parts of the brain’s language network.

Most aphasias occur as a result of damage to the left side of the brain, often from stroke or trauma but sometimes from a neurodegenerative disease process called *primary progressive aphasia (PPA)* (Gorno-Tempini et al., 2011). While some cases of PPA are due to a form of Alzheimer’s disease (Kirshner, 2012), many are caused by a disease called *frontotemporal degeneration (FTD)*, a condition that gradually kills nerve cells in the brain’s temporal or frontal lobes, often on one side more than on the other (Davies & Kipps, 2011; see Figure 18.11). The result may remind you of a stroke in the sense that FTD may affect a limited specific brain area, but unlike the sudden symptoms of a stroke, FTD symptoms develop gradually over years. If FTD is focused on the brain’s language-related regions, the result is PPA. Let’s consider where these language-related brain regions are, what they normally do, and what else can happen when their functioning is disrupted.

As described in the chapter on biological aspects of psychology, the brain uses several areas to make language possible. These interconnected regions work together as a network, and each must work properly to use and understand language. For example, it appears that *Broca’s area* is vital to our ability to translate thoughts into words or writing meaningful to others. Damage to Broca’s area (see Figure 18.12) causes **Broca’s aphasia**, characterized by a loss of language fluency (Burns & Fahy, 2010). That is, people with Broca’s aphasia cannot produce language smoothly and easily. Instead, they speak in a halting, sputtering manner, with great effort and often much frustration. There may be other features as well, including a change in the kinds of words that individuals produce (Benson & Geschwind, 1971). Most of the words that Broca’s aphasia patients produce refer to concrete objects, such as *book*, *pillow*, or *water*, rather than words that refer to abstract ideas such as *justice*, *art*, or *weather*. These patients also tend to use more nouns and verbs, leaving out articles, adjectives, and adverbs. This style of word usage is called “telegraphic,” recalling the bygone telegram era when people had to pay for each letter of a sent message (rekindled by smartphone texting, where an economy of letters spares finger movements!). Thus, a Broca’s aphasia patient who once would have said, “Please give me the spoon,” might now say simply, “Give spoon.” Sometimes Broca’s aphasic patients make naming mistakes, called *paraphasias*. In Broca’s aphasia, paraphasias tend to be *phonemic paraphasias*, errors in how a word sounds (e.g., call a pen a “peb”). Finally, people with Broca’s aphasia may show *agrammatism*, meaning reduced understanding of grammar (Johnson & Cannizzaro, 2009; Caplan, 2003a, 2003b). So, they may not understand that the sentences *The boy hit the girl* and *The girl was hit by the boy* have the same meaning.

People with aphasia caused by damage to *Wernicke’s area* (see Figure 18.12) have a different language problem. This area is needed to extract the meaning of language-related sensory information, so if its functioning is disrupted, people may not understand what they read or what others say (Goodglass & Kaplan, 1982). So to a person with **Wernicke’s aphasia**, other people’s speech can seem to be nonsense, making the world a suddenly strange place where everyone else has a problem. Unlike in Broca’s aphasia, in Wernicke’s aphasia people speak fluently and easily. But what they say is far from normal. They make *semantic paraphasias*, naming errors by using the wrong words (e.g., trying to name a pen, calling it a “book”). Unlike Broca’s aphasia, in Wernicke’s aphasia people use lots of adverbs, adjectives, and articles but fewer nouns and verbs. So the speech of a Wernicke’s aphasia patient may sound incomprehensible. For example, when attempting to describe a picture of a woman and her children in the kitchen, a Wernicke’s aphasia patient may say, “Over here is the top of the rest for the other rapid if am a many red sitters.” The speech of Wernicke’s aphasia patient may sound so disorganized that it can seem like the “word salad” of some people with schizophrenia (Sambunaris & Hyde, 1994; see the chapter on psychological disorders). Yet because the patients do not recognize their problems, people with Wernicke’s aphasia are often puzzled when others do not seem to understand them.

(continued)

language disorders (aphasias)
Neuropsychological disorders in which there are disruptions in the ability to speak, read, write, and understand language.

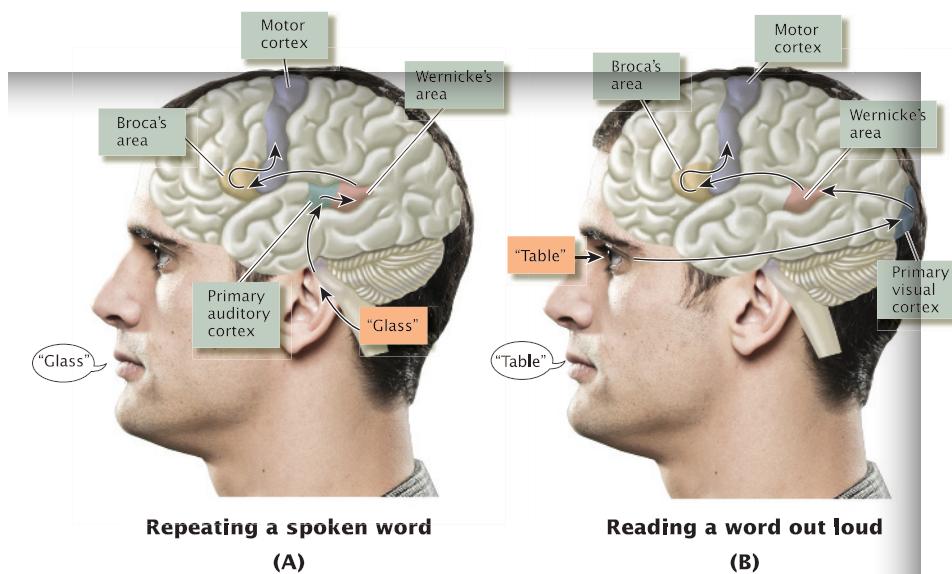
Broca’s aphasia A language disorder in which there is a loss of fluent speech.

Wernicke’s aphasia A language disorder in which there is a loss of ability to understand written or spoken language and to produce sensible speech.

FIGURE 18.12
The Wernicke-Geschwind Model of Aphasia

The Wernicke-Geschwind model of aphasia accounts for many (but not all) of the findings associated with the major aphasias. The pathways shown in Part A transmit information when a participant is instructed to repeat a spoken word. The image shown in Part B traces the flow of information when the person is asked to read a written word out loud.

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When brain damage causes language disorders, the injury is usually in the brain's left cerebral hemisphere, but right hemisphere damage can also affect communication. In general, people with right-hemisphere damage can still form words well and understand the words they hear and read. However, they may have problems using or understanding *prosody*, or tone of voice (Ross & Monnot, 2008). This problem, called *aprosodia* (pronounced "ap-ruh-SOH-dee-uh"), can take several forms (Ross, 1981, 2006). For example, damage to the right frontal lobe can cause *expressive aprosodia*, such that a person speaks in such a monotone that they need to say something like "I am angry" to convey how they are feeling (Ghacibeh & Heilman, 2003). However, such a patient may still understand and use prosody heard as other people speak. By contrast, people with damage to the right temporal and parietal regions may have a *receptive aprosodia*; they can use tone of voice correctly when they speak but have difficulty understanding it in others. So if someone were to say sarcastically, "Well, that was really smart," meaning just the opposite, a person with receptive aprosodia may miss the sarcasm, note only the words themselves, and say, "Thanks!"

Disorders of Movement Control

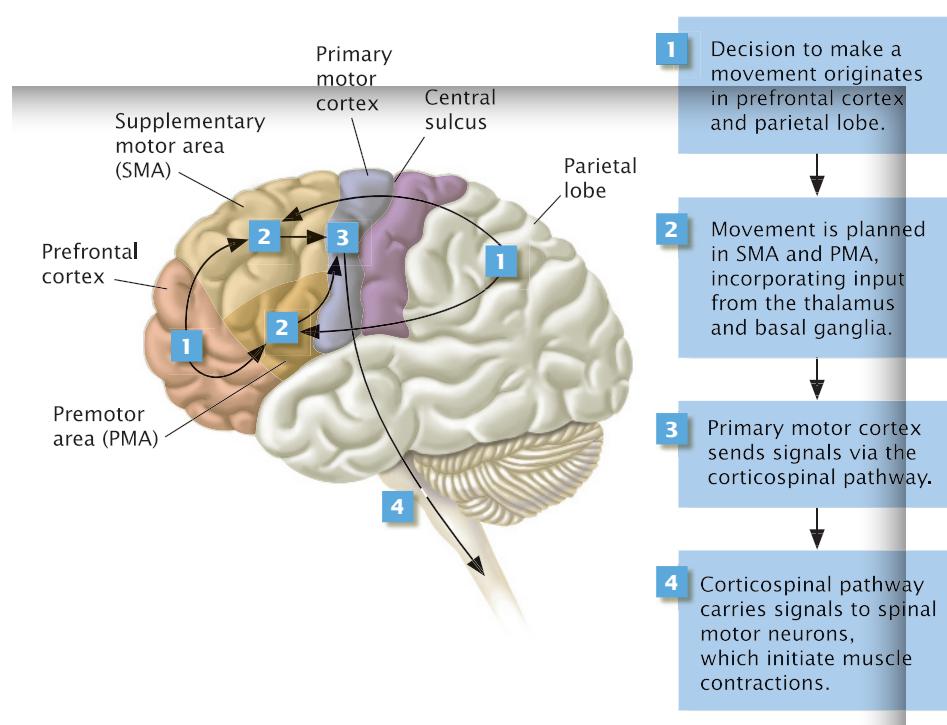
The brain's motor pathways are "wired" to muscles in ways that allow us to move our limbs and body, but the knowledge of how to do so in order to accomplish our goals effectively is not built in to that system (Goldenberg, 2013). Using silverware, pedaling a bicycle, sucking on a straw, or swinging a hammer are just a few examples of the many coordinated movements that we must learn from experience. A network of brain areas control such learned motor skills by instructing the brain's motor control centers to make the movements needed for each action sequence (see Figure 18.13). These brain areas give you the function of *praxis*, the ability to tell the motor system the combinations of movements needed for a specific learned task. When brain damage disrupts this process, the result is called *apraxia* (pronounced "uh-PRAK-see-uh"), an inability to do a learned skilled movement not due to weakness, a sensory problem, or a state of general confusion.

apraxia Neuropsychological disorder in which there are impairments in the ability to perform or coordinate a previously learned motor skills.

There are different types of apraxia (Heilman & Gonzalez-Rothi, 2003; Pearce, 2009). In *ideational apraxia*, individual movements are done right, but in the wrong order. For example, the person may open a tube of toothpaste, wet the toothbrush, squeeze paste onto the brush, insert the brush in the mouth, and move the brush in the mouth correctly. But she might put the brush in her mouth before putting paste on it, or she might squeeze the tube before unscrewing the cap.

FIGURE 18.13
The Initiation of Voluntary Movement

A network of brain regions is involved in initiating voluntary movements.

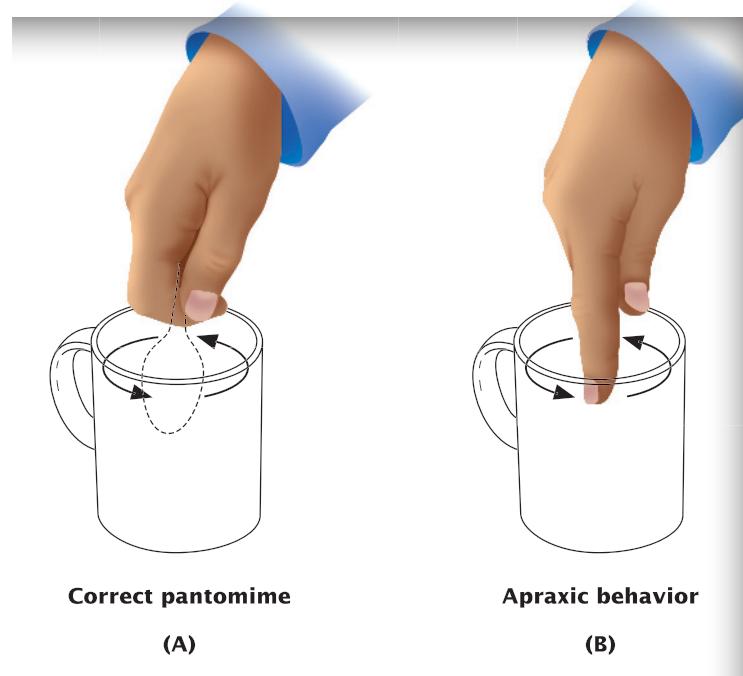


A more common apraxia is *ideomotor apraxia*, which involves difficulties not in the sequence of skilled movements but in movements themselves (Wheaton & Hallett, 2007). Such a patient may try to do each step in toothbrushing in order but has difficulty positioning the hand to hold the brush, or timing the limb motions to do the actual tooth brushing. Such a person may use a finger or body part as if it were a tool, perhaps brushing with the finger itself. In such cases, the person cannot seem to figure out how to use the actual tool they once utilized with ease (see Figure 18.14).

FIGURE 18.14
An Example of Apraxic Motor Behavior

When imitating the movements involved in using a common object, an individual with apraxia may mistakenly use an arm or a leg to represent that object. So instead of showing how they would move in order to use a tool, they act as if their limb is the tool itself.

Source: From Banich M. T. *Cognitive Neuroscience and Neuropsychology*, 2nd ed. (p. 179). Copyright © 2004 Cengage Learning.



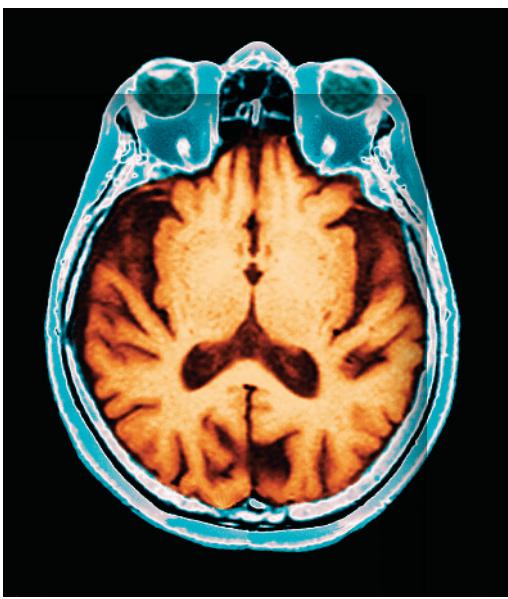


FIGURE 18.15
Brain Atrophy in Alzheimer's Disease

Alzheimer's disease causes some brain cells to stop working and eventually die, whereas other brain cells may be unaffected. Where brain cells die off, the cortex shrinks, leaving gaping spaces.

Zephyr/Science Source

Dementia

We saw earlier that people with delirium had alertness that was too high or low, and many psychological abilities may fail at once. Delirium usually stops some time after the toxin or other cause of delirium disappears. When we say a person has **dementia**, however, alertness remains mostly normal, yet many other mental functions are impaired (Dekosky et al., 2008). In dementia, there is a decline in memory and other areas of psychological functioning such as perceptual ability, language, or learned motor skills. By convention, to use the word "dementia," these impairments must be interfering with one's ability to function at work, in social situations, or in everyday tasks such as driving, cooking, or handling finances. In most cases, but not all, dementia is gradual, progressive, and irreversible. DSM-5, the fifth edition of the *American Psychiatric Association's Diagnostic and Statistical Manual* (2013), refers to dementia as *major neurocognitive disorder*, but whatever the name, about 35.6 million people worldwide have this problem, and that number is expected to more than double by the year 2030 (Prince et al., 2013).

A condition known as *mild cognitive impairment (MCI)* may precede some kinds of dementia (Petersen, 2011) (in DSM-5, MCI is termed *minor neurocognitive disorder*). In *amnestic MCI*, for example, a person develops memory problems to a certain degree, but no other deficits, and the person can maintain daily functioning. People with amnestic MCI may or may not get worse, but some do progress into dementia (Runtti et al., 2013). Identifying people in this relatively early stage of memory loss is important because following the so-called Mediterranean diet, and a diet rich in antioxidants, appears to slow cognitive decline at this stage (Shah, 2013). Medications are also being evaluated that may help to stabilize memory and delay full-fledged dementia (Karakaya et al., 2013).

Alzheimer's Disease

Dementia is often caused by a progressive neurodegenerative disease, and between 60 to 80 percent of the time, that disease is **Alzheimer's disease** (Alzheimer's Association, 2014; Fratiglioni & Qiu, 2009). In the United States, about 5.2 million people have Alzheimer's disease, costing \$203 billion a year and incalculable personal suffering (Thies, Bleiler, & Alzheimer's Association, 2013). The likelihood of Alzheimer's disease doubles about every five years after age sixty. As a result, over 5 million people over age sixty-five have this disease in the United States alone (Alzheimer's Association, 2014). With more people living longer, Alzheimer disease is expected to affect 65.7 million people worldwide by the year 2030 (Gulland, 2012).

Alzheimer's disease was first described in 1907 by the German neurologist Alois Alzheimer (Devi & Quitschke, 1999). He reported the case of a forty-six-year-old woman, "Frau Auguste Deter," with a type of "senility" (see Figure 18.15), and after she died, he described two types of microscopic abnormalities in her brain. First, he saw dead and dying nerve cells that had become twisted and misshapen, what we now call *neurofibrillary tangles*. Second, he saw abnormal debris lying outside of nerve cells. We now call this finding *amyloid plaque*. To this day, a definitive autopsy diagnosis of Alzheimer's disease requires neurofibrillary tangles and amyloid plaque (Nelson, Braak, & Markesberry, 2011).

In an Alzheimer's disease patient, the brain areas that develop neurofibrillary tangles fail to work properly, thus causing the patient's symptoms. But before neurofibrillary tangles cause symptoms, amyloid plaques accumulate diffusely in the patient's brain (Vos et al., 2013). According to the "amyloid cascade hypothesis," the cause of Alzheimer's disease lies in the toxic process of creating amyloid plaques (Krstic & Knuesel, 2013). We all develop some of this plaque as we get older, but in Alzheimer's disease patients, amyloid

dementia Neuropsychological disorders in which there are significant and disruptive impairments in memory, as well as in perceptual ability, language, or learned motor skills.

Alzheimer's disease Dementia resulting from a neurodegenerative disease characterized by the loss of cognitive functions.

plaque is much more abundant. Other scientists are looking at mitochondria of brain cells as a cause for Alzheimer's disease. Mitochondria give energy to cells by using oxygen and sugar from the blood supply. Some scientists argue that mitochondria dysfunction may be the initial defect causing the brain damage of Alzheimer's disease (Swerdlow, 2011). This argument is supported by findings that foods high in antioxidants, which are substances that help bypass the dysfunctional mitochondria, may help delay Alzheimer's disease (Shah, 2013).

Some areas of the cerebral cortex are more affected than others in Alzheimer's patients (Jacobs et al., 2012), leading to the neuropsychological symptoms of the disease (Peña-Casanova et al., 2013). One brain area affected is the temporal lobes, and in particular the hippocampus (Teipel et al., 2013), causing reduced ability to form new memories. Old memories, already formed and stored elsewhere, usually remain intact until the disease's later stages. So as in the case of H.M., Alzheimer's disease patients may remember details from early adulthood but not an event from yesterday. But, because the temporal lobes also help interpret visual sensations, patients with Alzheimer's disease may develop visual agnosia and so may not recognize the objects they see.

The parietal lobes are also affected. Dysfunction there can affect spatial perceptions, so a patient may get lost. Many Alzheimer's patients can get lost so easily that they may wander away from where they live (Rolland et al., 2007). Language problems also occur, especially *anomia*, meaning it is hard to name objects even if they know what the objects are. Many Alzheimer's patients may also develop apraxia, a problem we discussed earlier, making it hard to do learned motor skills such as using a hammer or a spoon.

There is still no way to prevent Alzheimer's disease (Friedrich, 2014). Medications help Alzheimer's disease patients to some degree, but the benefits remain slight, and more effective new treatments are still needed (Schneider, 2013). Meanwhile, the cognitive decline in Alzheimer's disease is lessened some by staying physically active (Sattler et al., 2011) and mentally active (Ballard et al., 2011).

Vascular Dementia

As we have already seen, a loss of blood supply to the brain can damage brain tissue. When this brain damage leads to dementia, we call this **vascular dementia** (O'brien, 2011). Sometimes a loss of blood supply to the brain occurs in tiny blood vessels, damaging a small amount of brain tissue. Such injuries may not cause symptoms at first, especially if vital areas are not affected. But if many such small injuries occur, more and more brain tissue is lost, and the cumulative effect can be an impairment of memory and other psychological functions (Fisher, 1989).

Vascular dementia is second only to Alzheimer's disease as a common cause of dementia (Korcyn, Vakhapova, & Grinberg, 2012). The two conditions may occur in the same individual (Honjo, Black, S. & Cerhoeff, 2012), but the symptoms of vascular dementia may differ from those of Alzheimer's disease (Knopman, 2006). Vascular dementia patients show memory loss, including forgetting of recent events, but in contrast to Alzheimer's disease, the hippocampus may be well preserved. So vascular dementia patients may still be able to form new memories. Why, then, do they have difficulty recalling new material? In some cases, the answer may be that they have more of a problem retrieving recent memories than in forming them. This subtle difference highlights the importance of careful neuropsychological assessment. Differences between vascular dementia and other dementias have also been found in the appearance of deficits such as aphasia, apraxia, and dyslexia (Topakian & Aichner, 2008).

vascular dementia A form of dementia caused by multiple restrictions of the brain's blood supply.

Treating Dementia

It is helpful for physicians to know what form of dementia a patient has in order to prescribe the correct medication and help families plan for the future (Leifer, 2009). Choosing the right drug at the right time can help patients enjoy a better quality of life for a longer time and may delay the need for nursing home care (Geldmacher et al., 2003). Accordingly, it would be ideal if Alzheimer's disease and other dementias could be diagnosed even before their symptoms appear. Scientists are working to develop early diagnostic clues using molecular tests and brain imaging (Ballard et al., 2011), analysis of EEG brain waves (Gasser et al., 2008), refined neuropsychological assessment batteries (De Santi et al., 2008), and observation of various behavioral changes (Caputo et al., 2008).

Progress in the development of new medications and early diagnostic tests leads many researchers to hope that instead of just stopping or slowing the progress of dementia, it may someday be possible to reverse its course, allowing some patients to once again enjoy more normal cognitive functioning (Lacor, 2007). And as discussed in the human development chapter, the appearance of dementia may be delayed or prevented in those who spend their lives engaged in stimulating mental activity, interactions with friends, and healthy eating and exercise (Fratiglioni & Qiu, 2009). ("In Review: Major Neuropsychological Disorders" summarizes the various dysfunctions discussed here.)

IN REVIEW

MAJOR NEUROPSYCHOLOGICAL DISORDERS

Syndrome	Type of Difficulty	Areas of Brain Malfunction
Apraxia	Making learned skilled movements even if not weak or confused	Usually left cerebral hemisphere parietal or frontal lobes
Visual	Attaching meaning to visual	Temporal lobes, often bilateral
Anosognosia	Becoming aware of the loss of neurological function	Usually right cerebral hemisphere
Hemineglect	Paying attention to one side of space	Usually right parietal lobe
Aphasia	Using language as a communication system	Usually left cerebral hemisphere
Aprosodia	Using tone of voice as a communication tool	Usually right cerebral hemisphere
Dementia	Memory and at least one other psychological ability that are severe enough to impair functioning	Variable, depending on the cause of the dementia

1. A patient who has become forgetful but has no problems in other areas of cognitive function may be said to have _____.
2. A dementia patient whose hippocampus is relatively intact and can still form new memories probably has _____ dementia.
3. A patient with thiamine deficiency who is forgetful but makes up memories and believes they are real probably has _____.

LINKAGES

As noted in the introductory chapter, all of psychology's subfields are related to one another. Our discussion of language disorders illustrates just one way in which the topic of this chapter, neuropsychology, is linked to the subfield of biological psychology, which is described in the chapter on biological aspects of psychology. The Linkages diagram shows ties to two other subfields, and there are many more ties throughout the book. Looking for linkages among subfields will help you see how they all fit together and help you better appreciate the big picture that is psychology.

CHAPTER 18 Neuropsychology



LINKAGES

How does damage to language areas of the brain affect language abilities?



CHAPTER 3
Biological Aspects of Psychology

What disorders are caused by damage to brain areas involved in memory?



CHAPTER 7
Thought and Language

What psychological tests are used in diagnosing neuropsychological disorders?



CHAPTER 8
Intelligence

SUMMARY

Neuropsychology is the subfield of psychology whose goal is to explore and understand the relationships among brain processes, human behavior, and psychological functioning.

Foundations of Neuropsychology

What is neuropsychology and how did it develop?

There are two main assumptions in neuropsychology. The first is that complicated mental tasks such as memory involve many subtasks that can be studied separately. The second is that different psychological processes are controlled by different brain regions or different combinations of brain regions. Experimental neuropsychologists use these assumptions as they conduct research on how the brain controls and organizes human mental activity. *Clinical neuropsychologists* use the results of neuropsychological research to try to understand the nature and location of brain disorders seen in individual patients.

Neuropsychology's early history focused on debates over *localization of function*, the idea that specific psychological functions are governed by specific parts of the brain. Early evidence for this notion was dismissed by serious scientists, but by the 1860s, localization of function began to be accepted, and it now forms the basis for much of what we know about neuropsychological functioning.

Recent theories of localization center on the idea that the brain is organized into *modules*, each of which performs its own unique analysis of information and works together with varying combinations of other modules throughout the brain to perform all aspects of behavior and mental processes.

Experimental neuropsychologists use *lesion analysis* to try to understand the complexities of localization of function; they look at how damage (lesions) in particular places in the brain relate to the appearance of particular problems.

Clinical neuropsychologists use a wide variety of *neuropsychological assessment* methods to help determine the nature of a patient's neuropsychological problems and even to suggest where in the brain the problem may lie. These tests may consist of a standardized group of instruments, such as the Halstead-Reitan Battery, or they may be an individualized combination of tests chosen by the neuropsychologist with a particular patient in mind. In most cases, a standard battery is followed by some additional individualized tests.

To develop their skills, clinical neuropsychologists typically earn a Ph.D. in clinical psychology with a focus on neuropsychology and then complete a postdoctoral internship.

Mechanisms of Brain Dysfunction

What are the main causes of brain damage and dysfunction?

Brain dysfunctions can be caused by a number of conditions.

One of the main causes of brain damage and dysfunction is a *cerebral infarct (stroke)*, which occurs when the blood supply to a part of the brain is blocked, causing the death of brain cells in that region and the loss of that brain region's ability to exercise its normal control over some aspect of behavior or mental processing. Strokes can be disabling and sometimes deadly.

Damage and dysfunction can also result from *traumatic brain injury (trauma)*, a sudden impact on the brain caused by a blow to the head, sudden and violent head movements, or other events that literally shake the brain inside the skull. The amount of damage and dysfunction following such events depends mainly on the amount of force involved and the degree to which the impact is cushioned by the action of the *cerebrospinal fluid*.

Neurodegeneration is the gradual process of damage to brain cells caused by *neurodegenerative diseases* such as Alzheimer's, Parkinson's, and Huntington's or by infections, nutritional deficiencies, or genetic abnormalities.

Neuropsychological Disorders

What disorders can be caused by brain damage or dysfunction?

The *syndromes*, or patterns of symptoms, associated with stroke, trauma, and neurodegenerative diseases appear as several kinds of neuropsychological disorders.

The hallmark of *amnestic disorders* is some significant disruption or loss of memory, as seen in conditions such as *anterograde amnesia*, in which new memories do not form, and *Korsakoff's*

psychosis (Korsakoff's syndrome), in which memory distortions and *confabulations* are caused by a lack of thiamine.

In *consciousness disturbances*, a person's normal awareness of the world is impaired. These conditions can range from loss of consciousness, as in coma or persistent vegetative state (which may result from damage to the *reticular formation*), to *delirium*, in which the patient alternates between reduced and elevated degrees of consciousness. In cases of *anosognosia*, a person may be paralyzed on one side of the body but have no awareness of the problem.

People who experience *perceptual disturbances* may become unable to understand what objects, or certain categories of objects, are by looking at them (*visual agnosia*), may be unable to recognize faces (*prosopagnosia*), or have difficulty assembling the specific parts of a visual scene into a coherent whole (*simultanagnosia*). Patients with a perceptual disorder called *hemineglect* ignore one half of the world.

Language disorders usually result from damage to language areas on the left side of the brain and take the form of *aphasias*, in which the ability to speak or understand language is disrupted. The many forms of aphasia include *Broca's aphasia*, in which people can no longer speak fluently, and *Wernicke's aphasia*, which makes it difficult for people to understand what they read or hear, and although they can speak fluently, their speech makes little or no sense. Damage in the right side of the brain can result in *aprosodia*, the loss of ability to use tone of voice to express one's meaning or to understand the meaning of other people's speech.

Apraxias involve the inability to perform various motor skills or the inability to perform those skills in the correct order.

Patients with *dementia* suffer gradually more significant and, usually, irreversible, loss of many mental functions, including impairment of memory, perception, language, and motor skills. It is usually caused by progressive neurodegenerative disorders such as *Alzheimer's disease*, though in *vascular dementia*, the cause is restrictions of the brain's blood supply. A condition known as mild cognitive impairment may precede the appearance of some forms of dementia.

TEST YOUR KNOWLEDGE

Select the best answer for each of the following questions. Then check your responses against the Answer Key at the end of the book.

1. Dr. Boar is an experimental neuropsychologist, whereas Dr. Yemas is a clinical neuropsychologist. This means that Dr. Boar's work will most likely involve _____; and Dr. Yemas's work will most likely involve _____.
 a. adding to the knowledge about general brain function; applying knowledge of brain function to specific patients
 b. adding to the knowledge about general brain function; adding to the knowledge about general brain function
 c. applying knowledge of brain function to specific patients; adding to the knowledge about general brain function
 d. applying knowledge of brain function to specific patients; applying knowledge of brain function to specific patients

2. The idea that feeling the bumps on a person's head can tell you about that person's psychological makeup, originated from the idea that _____.
 a. much-used areas of the brain shrink because they become more efficient at processing
 b. the brain is a homogenous organ that works in a unified fashion
 c. different areas of the brain perform different functions
 d. both a and b
3. Broca's area _____.
 a. is not related to a specific place in the brain but is used as a general descriptor for people experiencing any language impairment
 b. was identified when people experiencing language difficulties were found to have lesions in the left frontal part of the brain
 c. is a brain module used in all language functions in the brain
 d. directs the network responsible for language within the brain

4. When an experimental neuropsychologist performs lesion analysis, this means that she is _____.
a. looking for the one brain module that is responsible for the patient's neurological problem
b. looking for a dissociation between abilities
c. performing brain surgery to look at particular lesions in the brain
d. looking for general information about how normal brains work
5. Damian was having extreme difficulty remembering anything. His mother, worried about his memory, took him to the doctor to find out if his memory lapses were normal. The neuropsychologist evaluating Damian will most likely give him _____.
a. a battery of psychometric tests and compare his scores with established norms
b. a battery of psychometric tests and compare his scores with those of people with memory disorders
c. an individualized set of psychometric tests, which will be normed only for Damian
d. a clinical interview in which he asks Damian to identify changes in his own memory functioning
6. Jerry suddenly was unable to speak and felt "funny." His doctor's diagnosis was that Jerry had suffered a stroke. This means that _____.
a. Jerry had experienced some type of brain trauma
b. Jerry was experiencing pain in his brain
c. a blood vessel in Jerry's brain was blocked
d. parts of Jerry's brain temporarily stopped functioning
7. When Roselle was diagnosed with a neurodegenerative disease, she didn't understand what was happening. Her doctor explained that _____.
a. some blood vessels in her brain were blocked, killing brain tissue
b. the nerve cells of her brain had become too easily excitable
c. her brain had bumped against bone, causing microscopic tears
d. diseased brain neurons had stopped functioning correctly
8. Mickey cannot remember people he just met, but he still remembers his childhood. He also remembers that he was at the fateful Cubs baseball game when Steve Bartman interfered with the outfielder's catching of a fly ball. However, Mickey has never been to Chicago and was not at that game, despite what he believes he remembers. Mickey will most likely be diagnosed _____.
a. with Alzheimer's disease
b. as having had a stroke
c. with a brain infection such as herpes encephalitis
d. with Korsakoff's syndrome
9. When Betty was told that her mother was experiencing delirium, it was explained that this means that her mother _____.
a. probably would remain in a persistent vegetative state
b. could have both impaired and elevated levels of consciousness from time to time
c. had a problem caused by being very upset and nervous
d. would be likely to show signs of brain trauma
10. Rachel did not seek medical care when she had a stroke because her brain was damaged in such a way that she had no knowledge of the damage. In other words, Rachel experienced _____.
a. aphasia
b. anterograde amnesia
c. anosognosia
d. a deficiency in thiamine
11. When a patient experiences visual agnosia, it is often due to damage to the "what" pathway. This damage is most likely to be in the _____ lobe.
a. thalamic
b. parietal
c. temporal
d. frontal
12. Tracy was diagnosed with prosopagnosia. This means that Tracy will be unable to identify _____.
a. an apple she is holding
b. manufactured objects
c. the sound of a familiar voice
d. people's faces
13. When Robin experienced a stroke, she had significant damage to her right parietal lobe. She now ignores everything in the left side of space. Robin is showing symptoms of _____.
a. hemineglect
b. simultanagnosia
c. aphasia
d. anosognosia
14. A study described in the Focus on Research Methods section of this chapter was able to establish that patients with hemineglect _____.
a. ignore one side of space in a manner that is not explained by sensory loss
b. are no longer able to imagine scenes under any circumstances
c. can use only concrete visual stimuli
d. do not experience sensory deficits

- 15.** Alex had a language problem. He could speak, but not in a normal manner. He could use only a limited number of simple and concrete words. For example, when he wanted his wife to purchase applesauce when she went to the grocery store, he was only able to say, "Applesauce buy." A neuropsychologist would most likely look for damage to _____ in Alex's brain.
- Wernicke's area
 - Broca's area
 - the occipital lobe
 - the corpus callosum
- 16.** Allana also had a language problem. Her speech also was not normal. However, when she wanted her husband to purchase applesauce from the grocery store, she said "From flowing flowery in a with the shrubs buy over the other." We know that Allana is not schizophrenic, so we would infer that she has damage to _____.
- Wernicke's area
 - Broca's area
 - the occipital lobe
 - corpus callosum
- 17.** A neurological deficit in which people have difficulty reading the letters that they themselves wrote is known as _____.
- anosognosia
 - apraxia
 - alexia without agraphia
 - corpus callosumania
- 18.** Alfreda said to her husband, "I am very angry with you." However, she said it in a monotone that did not really suggest she was expressing anger. It was as though she had e-mailed him this information. A neuropsychologist would suspect Alfreda is experiencing _____.
- hemineglect
 - simultanagnosia
 - Alzheimer's disease
 - apraxia
- 19.** Fred's problem in remembering things was slowly becoming more apparent. In addition, he had to stop playing golf because he could no longer swing his club correctly. Yet he remained alert and attentive. His wife brought him to a neuropsychologist because Fred, a skilled accountant, could no longer even balance their checkbook. Fred most likely will be diagnosed with _____.
- dementia
 - delirium
 - aphasia
 - apraxia
- 20.** Research on Alzheimer's disease has found that _____.
- the number of people diagnosed with Alzheimer's disease decreases after age eighty
 - memory loss is the only significant symptom
 - patients with Alzheimer's have a different brain pathology than those experiencing normal aging
 - the disease begins with dysfunction in the dopamine neurotransmitter network

ANSWER KEY

Answers to In Review Questions

The questions at the bottom of each chapter's In Review charts are listed here, followed in parentheses by the correct answers. The questions are grouped under each chapter's title and by the name and page number of the In Review chart in which they appear.

Chapter 1 Introducing Psychology

In Review: The Development of Psychology (p. 15)

1. Darwin's theory of evolution had an especially strong influence on _____ism and _____ism. (functional; behavior)
2. Which school of psychological thought was founded by a European medical doctor? _____ (psychoanalysis)
3. In the history of psychology, _____ was the first school of thought to appear. (structuralism)

In Review: Approaches to the Science of Psychology (p. 20)

1. Teaching people to be less afraid of heights reflects the _____ approach. (behavioral)
2. Charles Darwin was not a psychologist, but his work influenced the _____ approach to psychology. (evolutionary)
3. Assuming that people inherit mental disorders suggests a _____ approach. (biological)

Chapter 2 Research in Psychology

In Review: Methods of Psychological Research (p. 39)

1. The _____ method is most likely to use a double-blind design. (experimental)
2. Research on a new treatment method is most likely to begin with _____. (case studies)
3. Studying language by listening to people in public places is an example of _____ research. (naturalistic observation)

Chapter 3 Biological Aspects of Psychology

In Review: Neurons, Neurotransmitters, and Receptors (p. 56)

1. In most cases, when one neuron communicates with another, a _____ crosses the _____ between them. (neurotransmitter; synapse)
2. The nervous system's main functions are to _____, _____, and _____ information. (receive; process; act on)
3. The two main types of cells in the nervous system are _____ and _____. (neurons; glial cells)

In Review: Organization of the Brain (p. 64)

1. The oldest part of the brain is the _____. (hindbrain)
2. Cells that operate as the body's twenty-four-hour "time clock" are found in the _____. (hypothalamus)
3. Memory problems seen in Alzheimer's disease are related to shrinkage of the _____. (hippocampus)

In Review: Classes of Neurotransmitters (p. 80)

1. The main neurotransmitter for slowing, or inhibiting, brain activity is _____. (GABA)

2. A group of neurons that use the same neurotransmitter is called a _____. (neurotransmitter system)
3. Which neurotransmitter's activity causes brain damage during a stroke? _____ (glutamate)

Chapter 4 Sensation and Perception

In Review: Seeing (p. 99)

1. The ability to see in very dim light depends on photoreceptors called _____. (rods)
2. Color afterimages are best explained by the _____ theory of color vision. (opponent-process)
3. Nearsightedness and farsightedness occur when images are not focused on the eye's _____. (retina)

In Review: Hearing (p. 103)

1. Sound energy is converted to neural activity in an inner ear structure called the _____. (cochlea [or basilar membrane])
2. Hearing loss due to damage to hair cells or the auditory nerve is called _____. (nerve deafness)
3. How high or low a sound sounds is called _____ and is determined by the _____ of a sound wave. (pitch; frequency)

In Review: Smell and Taste (p. 108)

1. The flavor of food arises from a combination of _____ and _____. (taste; smell)
2. Emotion and memory are linked especially closely to our sense of _____. (smell)
3. Perfume ads suggest that humans are affected by _____ that increase sexual attraction. (pheromones)

In Review: Body Senses (p. 114)

1. Gate control theory offers an explanation of why we sometimes do not feel _____. (pain)
2. Professional dancers look at the same spot as long as possible during repeated spins. They are trying to avoid the dizziness caused when the sense of _____ is overstimulated. (equilibrium)
3. Without your sense of _____, you would not be able to swallow food without choking. (touch)

In Review: Principles of Perceptual Organization and Constancy (p. 124)

1. The movement we see in videos is due to a perceptual illusion called _____. (the stroboscopic illusion)
2. People who have lost an eye also lose the ability to use _____ depth cues, two of which are called _____ and _____. (binocular; eye convergence; retinal disparity)
3. The grouping principle of _____ allows you to identify objects seen through a picket fence. (closure)

In Review: Mechanisms of Pattern Recognition (p. 128)

- Your ability to read a battered old sign that has some letters missing is a result of _____ processing. (top-down)
- When stimulus features match the stimuli we are looking for, _____ takes place. (recognition)
- Schemas can create a _____ that makes us more likely to perceive stimuli in a particular way. (perceptual set)

Chapter 5 Learning**In Review: Basic Processes of Classical Conditioning (p. 149)**

- If a person with a conditioned fear of spiders is also frightened by the sight of other creatures that look somewhat like spiders, the person is demonstrating stimulus _____. (generalization)
- Because of _____, we are more likely to learn a fear of snakes than a fear of cars. (biopreparedness)
- Feeling sad upon hearing a song associated with a long-lost relationship illustrates _____. (spontaneous recovery)

In Review: Reinforcement and Punishment (p. 161)

- Taking a pill can relieve headache pain, so people learn to do so through the process of _____ reinforcement. (negative)
- The “walk” sign that tells people it is safe to cross the street is an example of a _____ stimulus. (discriminative conditioned)
- Response rates tend to be higher under _____ schedules of reinforcement than under _____ schedules. (ratio; interval)

Chapter 6 Memory**In Review: Models of Memory (p. 184)**

- The value of elaborative rehearsal over maintenance rehearsal has been cited as evidence for the _____ model of memory. (levels-of-processing)
- Deliberately trying to remember something means using your _____ memory. (explicit)
- Playing the piano uses _____ memory. (procedural)

In Review: Storing New Memories (p. 190)

- If you looked up a phone number but forgot it before you could call it, the information was probably lost from _____ memory. (short-term)
- The capacity of short-term memory is about _____ to _____ items. (five; nine)
- Encoding is usually _____ in short-term memory and _____ in long-term memory. (acoustic; semantic)

In Review: Factors Affecting Retrieval from Long-Term Memory (p. 192)

- Stimuli called _____ help you recall information stored in long-term memory. (retrieval cues)
- If it is easier to remember something in the place where you learned it, you have _____ memory. (context-dependent)
- The tendency to remember the last few items in a list is called the _____ effect. (recency)

In Review: Improving Your Memory (p. 213)

- Using mnemonic strategies and the PQ4R system to better remember course material are examples of the value of _____ rehearsal. (elaborative)

- “Cramming” illustrates _____ practice that usually leads to _____ long-term retention than _____ practice. (massed; poorer [or less]; distributed)
- To minimize forgetting, you should review lecture notes _____ after a lecture ends. (immediately [or as soon as possible])

Chapter 7 Thought and Language**In Review: Ingredients of Thought (p. 227)**

- Thinking is the manipulation of _____. (mental representations)
- Arguments over what is “fair” occur because “fairness” is a _____ concept. (natural)
- Your _____ of “hotel room” would lead you to expect yours to include a bathroom. (schema)

In Review: Solving Problems (p. 237)

- People stranded without water could use their shoes to collect rain, but they may not do so because of an obstacle to problem solving called _____. (functional fixedness)
- Because of the _____ heuristic, once sellers set a value on their house, they may refuse to take much less for it. (anchoring)
- If you tackle a massive problem one small step at a time, you are using an approach called _____. (decomposition or means-end analysis)

Chapter 8 Intelligence**In Review: Influences on IQ (p. 275)**

- Intelligence is influenced by both _____ and _____. (heredity; environment)
- Children living in poverty tend to have _____ IQs than those in middle-class families. (lower)
- IQs of children whose parents encourage learning tend to be _____ than those of children whose parents do not. (higher)

In Review: Approaches to Intelligence (p. 280)

- The concepts of fluid and crystallized intelligence developed from research on the _____ approach to intelligence. (psychometric)
- Using fMRI scanning to relate memory skills to intelligence reflects the _____ approach to intelligence. (information processing)
- Which theory of intelligence highlights the fact that some people with low IQs can still succeed at complex tasks of daily living? (triarchic)

Chapter 9 Consciousness**In Review: Sleep and Sleep Disorders (p. 307)**

- Jet lag occurs because of a disruption in a traveler’s _____. (circadian rhythms [or sleep-wake cycle])
- The importance of NREM sleep is suggested by its appearance _____ in the night. (early)
- The safest sleeping position for babies is _____. (face up)

In Review: Major Classes of Psychoactive Drugs (p. 322)

- Physical dependence on a drug is a condition more commonly known as _____. (addiction)
- Drugs that act as antagonists _____ the interaction of neurotransmitters and receptors. (block)
- Drug effects are determined partly by what we learn to _____ the effects to be. (expect)

Chapter 10 Motivation and Emotion

In Review: Sources, Theories, and Types of Motivation (p. 335)

- The fact that some people like roller coasters and other scary amusement park rides has been cited as evidence for the _____ theory of motivation. (optimal arousal)
- Evolutionary theories of motivation are modern outgrowths of theories based on _____. (the instinct doctrine)
- The value of incentives can be affected by _____, _____, and _____ factors. (physiological [or biological]; cognitive; social)

In Review: Major Factors Controlling Hunger and Eating (p. 342)

- People may eat when they are “full,” suggesting that eating is not controlled by _____ alone. (hunger)
- People who binge and purge have an eating disorder called _____. Those who only binge have a disorder called _____. (bulimia; binge eating disorder)
- The best strategy for lasting weight loss includes regular _____, as well as improved eating habits. (exercise)

In Review: Theories of Emotion (p. 366)

- Research showing that there are pleasure centers in the brain has been cited in support of the _____ theory of emotions. (Cannon-Bard)
- The use of polygraphs in lie detection is based on the _____ theory of emotions. (James-Lange)
- The process of attribution is most important to _____ theories of emotions. (cognitive)

Chapter 11 Human Development

In Review: Milestones of Cognitive Development in Infancy and Childhood (p. 388)

- Research in cognitive development suggests that children form mental representations _____ than Piaget thought they did. (earlier)
- Recognizing that changing the shape of clay doesn’t change the amount of clay is evidence of a cognitive ability called _____. (conservation)
- The appearance of object permanence signals the end of the _____ period. (sensorimotor)

In Review: Social and Emotional Development During Infancy and Childhood (p. 406)

- As part of their social development, children learn _____, which tell them what patterns of appearance and behavior are associated with being male or female. (gender roles)
- Teaching children to talk quietly in a restaurant is part of the process called _____. (socialization)
- Strict rules and the threat of punishment are typical of _____ parenting. (authoritarian)

In Review: Milestones of Adolescence and Adulthood (p. 420)

- The greatest threat to cognitive abilities in late adulthood is _____ disease. (Alzheimer’s)
- Adolescents’ _____ identity may be more defining than their national citizenship. (ethnic)
- Not stealing because “I might get caught” reflects the _____ stage of moral reasoning. (preconventional)

Chapter 12 Health, Stress, and Coping

In Review: Stress Responses and Stress Mediators (p. 444)

- The friends and family we can depend on to help us deal with stressors are called our _____ network. (social support)
- Fantasizing about winning money is a(n) _____ -focused way of coping with financial stress. (emotion)
- Sudden, extreme stressors may cause psychological and behavioral problems known as _____. (posttraumatic stress disorder)

In Review: Methods for Coping with Stress (p. 452)

- Catastrophizing thoughts are best overcome through _____ coping strategies. (cognitive)
- The first step in coping with stress is to _____ the sources and effects of your stressors. (identify)
- True or false: It is best to rely on only one good coping strategy. _____ (false)

Chapter 13 Personality

In Review: Major Approaches to Personality (p. 476)

- Tests that measure the five-factor model’s dimensions of personality are based on the _____ approach to personality. (trait)
- The role of learning is most prominent in the _____ approach to personality. (social-cognitive)
- Object relations and attachment theories are modern variants on _____ personality theories. (psychodynamic)

In Review: Personality Measures (p. 484)

- Projective personality measures are based on the _____ approach to personality. (psychodynamic)
- The NEO-PI-3 and the MMPI-2-RF are examples of _____ tests. (nonprojective)
- Most personality researchers use _____ tests in their work. (nonprojective)

Chapter 14 Psychological Disorders

In Review: Anxiety, Obsessive-Compulsive, Somatic Symptom, and Dissociative Disorders (p. 512)

- Concern that it may be triggered by media stories or therapists’ suggestions has made _____ the most controversial of the dissociative disorders. (dissociative identity disorder)
- A person who sleepwalks but is not able to walk when awake is showing signs of _____. (conversion disorder)
- Panic disorder is sometimes associated with another anxiety disorder called _____. (agoraphobia)

In Review: Depressive and Bipolar Disorders (p. 515)

- The risk of suicide is associated with _____ more than with any other symptom of disorder. (depression)
- Cyclothymic disorder is a less severe version of _____. (bipolar disorder)
- Women are _____ likely than men to try suicide, but men are _____ likely to succeed. (more; more)

In Review: Schizophrenia Spectrum Disorders (p. 523)

- The _____ approach forms the basis of the vulnerability theory of schizophrenia. (diathesis-stress)

2. Hallucinations are _____ symptoms of schizophrenia; lack of emotion is a symptom. (positive; negative)
3. Patients with schizophrenia who were able to finish school are _____ likely to show improvement. (more)

Chapter 15 Treatment of Psychological Disorders

In Review: Approaches to Psychological Treatment (p. 553)

1. Object relations therapy and interpersonal therapy are both contemporary examples of the _____ approach to psychological treatment. (psychodynamic)
2. Imagining increasingly fear-provoking stimuli while relaxed is a treatment method called _____. (systematic desensitization)
3. Reflection is an interviewing technique associated mainly with the _____ approach to treatment. (humanistic [or nondirective])

Chapter 16 Social Psychology

In Review: Some Biases in Social Perception (p. 584)

1. The fundamental attribution error appears to be somewhat less likely to occur among people in _____ cultures. (collectivist)
2. First impressions form _____, but tend to change _____. (quickly; slowly)
3. If you believed that immigrants' successes are due to government help but that their failures are due to laziness, you would be committing the _____ error. (ultimate attribution)

In Review: Forming and Changing Attitudes (p. 587)

1. According to the elaboration likelihood model, people are more likely to pay close attention to the content and logic of a persuasive message if the _____ route to attitude change has been activated. (central)
2. Holding attitudes that are similar to those of your friends illustrates the importance of _____ in attitude formation. (learning)
3. According to cognitive dissonance theory, we tend to reduce conflict between attitudes and behaviors by changing our _____. (attitudes)

In Review: Types of Social Influence (p. 606)

1. Joining the end of a ticket line is an example of _____, whereas forming two lines when a theater employee requests it is an example of _____. (conformity; compliance)
2. Seeing someone disobey a questionable order makes people _____ likely to obey the order themselves. (less)
3. Pricing your used car for more than you expect to get but then agreeing to reduce it to make a sale is an example of the _____ approach to gaining compliance. (door-in-the-face)

In Review: Prosocial Behavior (p. 616)

1. If you could save only one person from a burning house, the _____ theory of prosocial behavior would predict that it would be your own child rather than, say, a grandparent. (evolutionary)
2. Are you more likely to receive help in a nearly empty bus or in a crowded bus terminal? _____. (a nearly empty bus)

3. People who have empathy for others are _____ likely to be helpful. (more)

Chapter 17 Industrial/Organizational Psychology

In Review: Assessing People, Jobs, and Job Performance (p. 635)

1. Lists of critical incidents are contained in _____-focused employee rating forms. (behavior)
2. A potential employer might use a two-day _____ to measure your skill at the job you want. (assessment center)
3. In general, _____ interviews are more useful in employee selection than _____ interviews. (structured; unstructured)

In Review: Recruiting, Selecting, and Training Employees (p. 642)

1. Employees tend to remember more from a training program when it is set up on a _____ rather than a _____ schedule. (distributed; massed)
2. Depending on walk-in applications is usually acceptable when hiring _____-level employees. (low)
3. Assuring that your hiring criteria actually predict employees' job performance requires a _____. (validation study)

Chapter 18 Neuropsychology

In Review: Foundations of Neuropsychology (p. 669)

1. A person who studies individual patients to determine what kind of brain damage each one happens to have is called a _____. (clinical neuropsychologist)
2. The case of "Tan" helped to establish the principle of _____. (localization of function)
3. In alexia without agraphia, the brain areas that control reading and writing are intact but cannot interact. This condition is called a _____. (disconnection syndrome)

In Review: Mechanisms of Brain Dysfunction (p. 673)

1. The brain floats in a bath of _____ inside the skull. (cerebrospinal fluid)
2. The brain needs a constant flow of fresh _____ all the time. (blood)
3. Cerebrovascular accidents rank as the number _____ cause of death in the United States. (four)

In Review: Major Neuropsychological Disorders (p. 688)

1. A patient who has become forgetful but has no problems in other areas of cognitive function may be said to have _____. (mild cognitive impairment)
2. A dementia patient whose hippocampus is relatively intact and can still form new memories probably has _____ dementia. (non-Alzheimer)
3. A patient with thiamine deficiency who is forgetful but makes up memories and believes they are real probably has _____. (Korsakoff's syndrome)

Test Your Knowledge

Answer Key

Chapter 1

1c, 2c, 3b, 4d, 5a, 6c, 7a, 8c, 9d, 10b, 11b, 12a, 13c, 14d, 15b, 16a, 17d, 18c, 19b, 20d

Chapter 2

1d, 2a, 3c, 4d, 5a, 6d, 7a, 8b, 9b, 10d, 11c, 12d, 13c, 14a, 15d, 16b, 17b, 18b, 19d, 20c

Chapter 3

1c, 2c, 3b, 4b, 5c, 6d, 7c, 8a, 9a, 10d, 11a, 12b, 13a, 14d, 15a, 16b, 17b, 18d, 19a, 20a

Chapter 4

1a, 2b, 3a, 4d, 5b, 6b, 7d, 8d, 9c, 10d, 11a, 12b, 13c, 14a, 15c, 16b, 17c, 18d, 19b, 20a

Chapter 5

1c, 2b, 3b, 4a, 5d, 6a, 7a, 8c, 9a, 10b, 11b, 12b, 13d, 14d, 15b, 16d, 17b, 18c, 19d, 20c

Chapter 6

1a, 2b, 3c, 4b, 5a, 6c, 7b, 8a, 9c, 10d, 11a, 12c, 13c, 14c, 15d, 16d, 17a, 18b, 19d, 20a

Chapter 7

1d, 2c, 3b, 4d, 5b, 6d, 7c, 8a, 9c, 10a, 11d, 12c, 13c, 14d, 15b, 16a, 17b, 18c, 19c, 20b

Chapter 8

1a, 2B, 3c, 4a, 5c, 6d, 7a, 8a, 9a, 10a, 11b, 12b, 13c, 14d, 15d, 16b, 17d, 18b, 19d, 20c

Chapter 9

1a, 2b, 3c, 4b, 5d, 6c, 7c, 8a, 9b, 10c, 11d, 12d, 13c, 14a, 15d, 16a, 17D, 18c, 19b, 20b

Chapter 10

1b, 2a, 3d, 4b, 5a, 6b, 7b, 8c, 9d, 10b, 11c, 12a, 13c, 14c, 15a, 16d, 17b, 18d, 19b, 20b

Chapter 11

1b, 2c, 3d, 4a, 5c, 6a, 7c, 8b, 9a, 10B, 11b, 12d, 13c, 14d, 15C, 16d, 17a, 18c, 19c, 20b

Chapter 12

1c, 2a, 3d, 4a, 5c, 6d, 7b, 8b, 9b, 10c, 11c, 12b, 13b, 14c, 15b, 16d, 17a, 18a, 19a, 20c

Chapter 13

1b, 2a 3d, 4d, 5a, 6d, 7b, 8c, 9d, 10c, 11b, 12a, 13c, 14d, 15c, 16c, 17b, 18d, 19c, 20b

Chapter 14

1b, 2b, 3c, 4d, 5d, 6d, 7c, 8a, 9a, 10a, 11b, 12b, 13a, 14b, 15d, 16c, 17a, 18d, 19d, 20b

Chapter 15

1c, 2a, 3a, 4b, 5c, 6b, 7c, 8d, 9c, 10b, 11c, 12b, 13a, 14d, 15b, 16d, 17a, 18c, 19b, 20c

Chapter 16

1c, 2a, 3b, 4c, 5d, 6c, 7b, 8c, 9b, 10a, 11d, 12b, 13c, 14a, 15b, 16d, 17a, 18a, 19b, 20b

Chapter 17

1a, 2c, 3a, 4b, 5c, 6c, 7a, 8d, 9c, 10a, 11c, 12b, 13c, 14b, 15d, 16b, 17b, 18a, 19b, 20a

Chapter 18

1a, 2c, 3b, 4a, 5a, 6c, 7d, 8d, 9b, 10c, 11c, 12d, 13a, 14a, 15b, 16a, 17c, 18d, 19a, 20c

APPENDIX A

Statistics in Psychological Research

Understanding and interpreting the results of psychological research depend on *statistical analyses*, which are methods for describing and drawing conclusions from data. The chapter on research in psychology introduced some terms and concepts associated with *descriptive statistics*—the numbers that psychologists use to describe and present their data—and with *inferential statistics*—the mathematical procedures they use to help draw conclusions from data and to make inferences about what those data mean. Here, we present more details about these statistical analyses to help you evaluate research results.

DESCRIBING DATA

To illustrate our discussion, consider a hypothetical experiment on the effects of incentives on performance. The experimenter presents a list of mathematics problems to two groups of participants. Each group must solve the problems within a fixed time, but for each correct answer, the low-incentive group is only paid ten cents, whereas the high-incentive group gets one dollar. The hypothesis to be tested is the **null hypothesis**, the assertion that the independent variable directly manipulated by the experimenter will have no effect on the dependent variable measured by the experimenter. In this case, the null hypothesis is that the size of the incentive (the independent variable) will not affect performance on the mathematics task (the dependent variable).

Assume that the experimenter has gathered a representative sample of participants, assigned them randomly to the two groups, and done everything possible to avoid the confounds and other research problems we discussed in the chapter on research in psychology. The experiment has been run, and the psychologist now has the data: a list of the number of correct answers given by each participant in each group. Now comes the first task of statistical analysis: describing the data in a way that makes them easy to understand.

The Histogram

The simplest way to describe the data is with something like Table 1, which just lists all the numbers. After examining the table, you might conclude that the high-incentive group did better than the low-incentive group, but this is not immediately obvious. The difference might be even harder to see if more participants had been involved and if the scores included three-digit numbers. If a picture is “worth a thousand words,” then a better way to present the same data is in a picture-like graphic called a **histogram** (see Figure 1).

null hypothesis A testable statement that the independent variable manipulated by the experimenter will have no effect on the dependent variable measured by the experimenter.

histogram A graphic presentation of data that consists of a set of bars, each of which represents how frequently different scores or values occur in a data set.

Making a histogram is simple. First, divide the scale for measuring the dependent variable (in this case, the number of correct answers) into a number of categories, or “bins.” The bins in our example are 1–2, 3–4, 5–6, 7–8, and 9–10. Next, sort the raw data into the appropriate bin. (For example, the score of a participant who had 5 correct answers would go into the 5–6 bin, a score of 8 would go into the 7–8 bin, and so on.) Finally, for each bin, count the number of scores in that bin and draw a bar up to the height of that number on the vertical axis of a graph. The resulting set of bars makes up the frequency histogram.

Because we want to compare the scores of two groups, there are separate histograms in Figure 1: one for the high-incentive group and one for the low-incentive group. Now the difference between groups that was difficult to see in Table 1 stands out more clearly, doesn’t it? High scores were more common among people in the high-incentive group than among those in the low-incentive group.

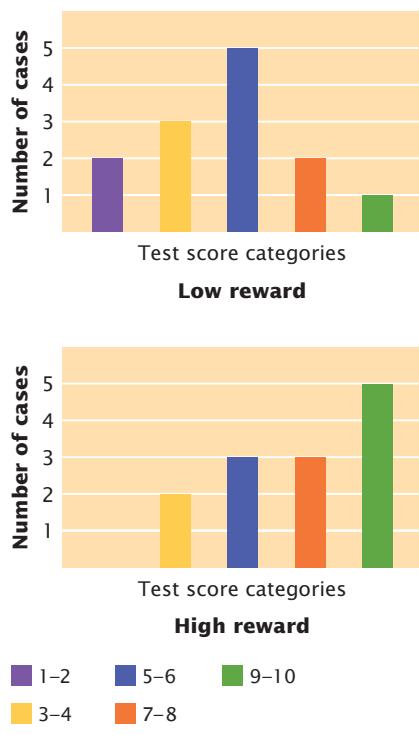


FIGURE 1
Histograms

The height of each bar of a histogram represents the number of scores falling within each range of score values. The pattern formed by these bars gives a visual image of how research results are distributed.

TABLE 1 A SIMPLE DATA SET

Here are the test scores obtained by thirteen participants performing under low-incentive conditions and thirteen participants performing under high-incentive conditions.

Low Incentive	High Incentive
4	6
6	4
2	10
7	10
6	7
8	10
3	6
5	7
2	5
3	9
5	9
9	3
5	8

Histograms and other pictures of data help to visualize and understand the “shape” of research results, but to analyze those results statistically, we need to use other ways of handling the data that make up these graphic presentations. For example, before we can say whether two histograms are different statistically or just visually, the data they represent must be summarized by *descriptive statistics*.

Descriptive Statistics

The three most important descriptive statistics are *measures of central tendency*, which describe the typical score in a set of data; *measures of variability*, which describe the spread, or dispersion, among the scores in a set of data; and *correlation coefficients*, which describe relationships between variables.

Measures of Central Tendency

In the research in psychology chapter, we described a treatment called eye movement desensitization and reprocessing (EMDR). Suppose you wanted to test whether EMDR affects fear of the dark. You find participants by giving volunteers an anxiety test and end up collecting the eleven self-ratings of anxiety listed on the left side of Table 2. What is the typical score, the *central tendency*, that best describes the anxiety level of this group of people? You can choose from three measures to capture this typical score: the mode, the median, and the mean.

The **mode** is the value or score that occurs most frequently in a data set. You can find it by simply counting how many times each score appears. On the left side of Table 2, the mode is 50, because the score of 50 occurs more often than any other. Notice, however,

mode A measure of central tendency that is the value or score that occurs most frequently in a data set.

TABLE 2 A SET OF PRETREATMENT ANXIETY RATINGS

Here are scores representing people's self-ratings, on a 1–100 scale, of their fear of the dark.

Data from 11 Participants		Data from 12 Participants	
Participant Number	Anxiety Rating	Participant Number	Anxiety Rating
1	20	1	20
2	22	2	22
3	28	3	28
4	35	4	35
5	40	5	40
6	45 (Median)	6	45 (Median = 46 ^a)
7	47	7	47
8	49	8	49
9	50	9	50
10	50	10	50
11	50	11	50
		12	100

Measures of central tendency

Mode = 50
Median = 45
Mean = $436/11 = 39.6$

Measures of central tendency

Mode = 50
Median = 46
Mean = $536/12 = 44.7$

Measures of variability

Range = 30
Standard deviation = 11.064

Measures of variability

Range = 80
Standard deviation = 19.763

^aWhen there is an uneven number of scores, the exact middle of the list lies between two numbers. The median is the value halfway between those numbers.

that in this data set the mode is actually an extremely high score. Sometimes the mode acts like a microphone for a small but vocal minority that, though speaking loudest or most frequently, may not represent the views of the majority.

Unlike the mode, the median takes all scores into account. The **median** is the halfway point in a set of data. When scores are arranged from lowest to highest, half the scores fall above the median, and half fall below it. For the scores on the left side of Table 2, the halfway point—the median—is 45.

The third measure of central tendency is the **mean**, which is the *arithmetic average* of a set of scores. When people talk about the “average” in everyday conversation, they are usually referring to the mean. To find the mean, add the scores and divide by the number of scores. For the data on the left side of Table 2, the mean is $436/11 = 39.6$.

Like the median (and unlike the mode), the mean reflects all the data to some degree, not just the most frequent data. Notice, however, that the mean reflects the actual values of all the scores, whereas the median gives each score equal weight, whatever its value. This

median A measure of central tendency that is the halfway point in a set of data: Half the scores fall above the median and half fall below it.

mean A measure of central tendency that is the arithmetic average of the scores in a set of data.

Descriptive statistics are valuable for summarizing research results, but we must evaluate them carefully before drawing conclusions about what they mean. Given this executive's reputation for uncritical thinking, you can bet that Dogbert's impressive-sounding restatement of the definition of *median* will win him an extension of his pricey consulting contract.

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distinction can have a big effect on how well the mean and median represent the scores in a particular set of data. Suppose that you add to your sample a twelfth participant, whose anxiety rating is 100. When you reanalyze the anxiety data (see the right side of Table 2), the median hardly changes, because the new participant counts as just one more score. However, when you compute the new mean, the actual *amount* of the new participant's rating is added to everyone else's ratings; as a result, the mean jumps 5 points. As this example shows, the median is sometimes a better measure of central tendency than the mean because the median is less sensitive to extremely high or extremely low scores. But because the mean is more representative of the values of all the data, it is often a preferred measure of central tendency.

Measures of Variability

The variability (also known as *spread* or *dispersion*) in a set of data is described by statistics known as the *range* and the *standard deviation*. The **range** is simply the difference between the highest and the lowest scores in a data set (it would be 30 for the data on the left side of Table 2 and 80 for the data on the right side). In contrast, the **standard deviation (SD)** measures the average difference between each score and the mean of the data set. So the standard deviation tells us how much the scores in a data set vary, or differ from one another. The more variable the data are, the higher the standard deviation will be. For example, the SD for the eleven participants on the left side of Table 2 is 11.064, but it rises to 19.763 once that very different twelfth score is added on the right side.

The Effect of Variability

TRY THIS Suppose that on your first day as a substitute teacher at a new school, you are offered either of two classes. The mean IQ score in both classes is 100, but the standard deviation (SD) of scores is 16 in one class and 32 in the other. Before you read the next sentence, ask yourself which class you would choose if you wanted an easy day's work or if you wanted a tough challenge. (A higher standard deviation means more variability, so students in the class with the SD of 32 will vary more in ability, thus creating a greater challenge for the teacher.)

Education Images/Contributor/Universal Images Group/Getty Images



TABLE 3 CALCULATING THE STANDARD DEVIATION

The standard deviation of a set of scores reflects the average degree to which those scores differ from the mean of the set..

Raw Data	Difference from Mean = D	D^2
2	$2 - 4 = -2$	4
2	$2 - 4 = -2$	4
3	$3 - 4 = -1$	1
4	$4 - 4 = 0$	0
9	$9 - 4 = 5$	25
Mean = $20/5 = 4$		$\Sigma D^2 = 34$
Standard deviation = $\sqrt{\frac{\Sigma D^2}{N}} = \sqrt{\frac{34}{5}} = \sqrt{6.8} = 2.6$		

Note: Σ means “the sum of.”

To see how the standard deviation is calculated, consider the data in Table 3. The first step is to compute the mean of the set—in this case, $20/5 = 4$. Second, calculate the difference, or *deviation* (D), of each score from the mean by subtracting the mean from each score, as in column 2 of Table 3. Third, find the average of these deviations. Notice, though, that if you calculated this average by finding the arithmetic mean, you would sum the deviations and find that the negative deviations exactly balance the positive ones, resulting in a mean difference of 0. Obviously, there is more than zero variation around the mean in the data set. So, instead of employing the arithmetic mean, you compute the standard deviation by first squaring the deviations (which, as shown in column 3 of Table 3, removes any negative values). You then add up these squared deviations, divide the total by N , and then take the square root of the result.

The Normal Distribution

Now that we have described histograms and reviewed some descriptive statistics, let's re-examine how these methods of representing research data relate to some of the concepts discussed elsewhere in the book.

In most subfields in psychology, when researchers collect many measurements and plot their data in histograms, the resulting pattern often resembles the one shown for the low-incentive group in Figure 1. That is, the majority of scores tend to fall in the middle of the distribution, with fewer and fewer scores occurring toward the extremes. As more and more data are collected, and as smaller and smaller bins are used (perhaps containing only one value each), histograms tend to smooth out until they resemble the bell-shaped curve, also known as the **normal distribution**, or *normal curve*. When a distribution of scores follows a truly normal curve, its mean, median, and mode all have the same value. Furthermore, if the curve is normal, we can use its standard deviation to describe how any particular score stands in relation to the rest of the distribution.

IQ scores provide an example. They are distributed in a normal curve, with a mean, median, and mode of 100 and an SD of 16—as shown in Figure 2. In such a distribution, half of the population has an IQ above 100 and half below 100. The shape of a true normal curve is that 68 percent of the area under it lies in a range within one standard deviation above and below the mean. So, for IQ scores, this means that 68 percent of the population has an IQ somewhere between 84 (100 minus 16) and 116 (100 plus 16). Of the remaining 32 percent of the population,

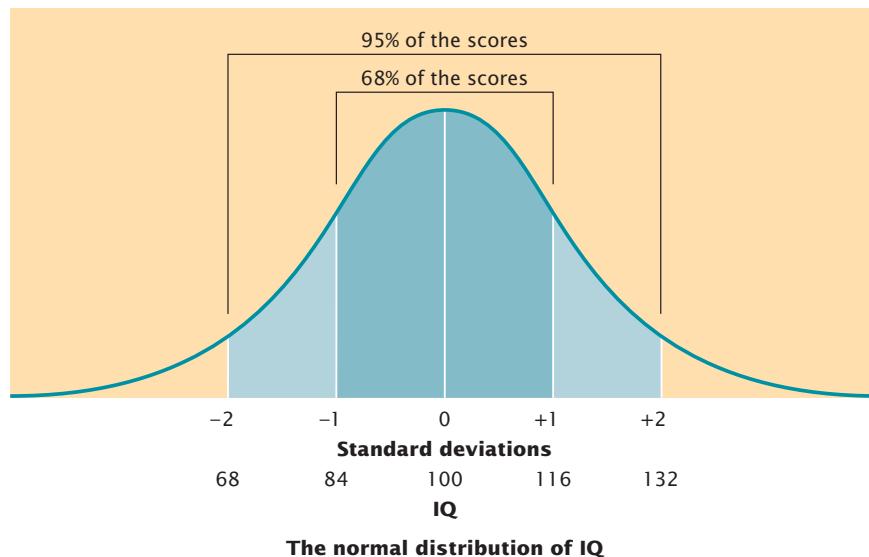
range A measure of variability that is the difference between the highest and the lowest values in a data set.

standard deviation (SD) A measure of variability that is the average difference between each score and the mean of the data set.

normal distribution A dispersion of scores such that the mean, median, and mode all have the same value.

FIGURE 2**The Normal Distribution**

Many kinds of research data approximate the balanced, or symmetrical, shape of the normal curve, in which most scores fall toward the center of the range.



half falls more than 1 SD above the mean and half falls more than 1 SD below the mean. Thus, 16 percent of the population has an IQ above 116 and 16 percent scores below 84.

The normal curve is also the basis for percentiles. A **percentile** refers to the percentage of people or observations that fall below a given score in a normal distribution. In Figure 2, for example, the mean score (which is also the median) lies at a point below which 50 percent of the scores fall. Thus the mean of a normal distribution is at the 50th percentile. What does this say about IQ? If you score 1 SD above the mean, your score is at a point above which only 16 percent of the population falls. This means that 84 percent of the population (100 percent minus 16 percent) must be below that score; so this IQ score is at the 84th percentile. A score at 2 SDs above the mean is at the 97.5 percentile, because only 2.5 percent of the scores are above it in a normal distribution.

Scores may also be expressed in terms of their distance in standard deviations from the mean, producing what are called **standard scores**. A standard score of 1.5, for example, is 1.5 standard deviations from the mean.

Correlation

Histograms and measures of central tendency and variability describe certain characteristics of one dependent variable at a time. However, psychologists often want to describe the relationship between two variables. Measures of correlation are frequently used for this purpose. We discussed the interpretation of the **correlation coefficient** in the chapter on research in psychology; here we describe how to calculate it.

Recall that correlations are based on the relationship between two numbers that are associated with each participant or observation. The numbers might represent, say, a person's height and weight or the IQ scores of a parent and child. Table 4 contains this kind of data for four participants from our incentives study who took the test twice. (As you may recall from the chapter on intelligence, the correlation between their scores would be a measure of test-retest reliability.)

The formula for computing the Pearson product-moment correlation, or r , is as follows:

$$r = \frac{\sum(x - M_x)(y - M_y)}{\sqrt{\sum(x - M_x)^2 \sum(y - M_y)^2}}$$

where:

x = each score on variable 1 (in this case, test 1)

y = each score on variable 2 (in this case, test 2)

M_x = the mean of the scores on variable 1

M_y = the mean of the scores on variable 2

percentile A value that indicates the percentage of people or observations that fall below a given point in a normal distribution.

standard scores Values that indicate the distance, in standard deviations, between a given score and the mean of all the scores in a data set.

correlation coefficient A statistic, r , that summarizes the strength and direction of a relationship between two variables.

The main function of the denominator (bottom part) in this formula is to ensure that the coefficient ranges from +1.00 to -1.00, no matter how large or small the values of the variables being correlated. The “action element” of this formula is the numerator (or top part). It is the result of multiplying the amounts by which each of two observations (x and y) differ from the means of their respective distributions (M_x and M_y). Notice that, if the two variables “go together” (so that if one score is large, the score it is paired with is also large, and if one is small, the other is also small), then both scores in each pair will tend to be above the mean of their distribution or both of them will tend to be below the mean of their distribution. When this is the case, $x - M_x$ and $y - M_y$ will both be positive, or they will both be negative. In either case, when you multiply one of them by the other, their product will always be positive, and the correlation coefficient will also be positive. If, on the other hand, the two variables go opposite to one another (such that when one score in a pair is large, the other is small), one of them is likely to be smaller than the mean of its distribution, so that either $x - M_x$ or $y - M_y$ will have a negative sign and the other will have a positive sign. Multiplying these differences together will always result in a product with a negative sign, and r will be negative as well.

Now compute the correlation coefficient for the data presented in Table 4. The first step (step *a* in the table) is to compute the mean (M) for each variable. M_x turns out to be 3 and M_y is 4. Next, calculate the numerator by finding the differences between each x and y value and its respective mean and by multiplying them (as in step *b* of Table 4). Notice that, in this example, the differences in each pair have like signs, so the correlation coefficient will be positive. The next step is to calculate the terms in the denominator; in this case, as shown in steps *c* and *d* in Table 4, they have values of 18 and 4. Finally, place all the terms in the formula and carry out the arithmetic (step *e*). The result in this case is an r of +.94, a high and positive correlation suggesting that performances on repeated tests are very closely related. A participant doing well the first time is very likely to do well again; a person doing poorly at first will probably do no better the second time.

TABLE 4 CALCULATING THE CORRELATION COEFFICIENT

Though it appears complex, calculation of the correlation coefficient is quite simple. The resulting r reflects the degree to which two sets of scores tend to be related, or to co-vary.

Participant	Test 1	Test 2	$(x - M_x)(y - M_y)^{(b)}$
A	1	3	$(1 - 3)(3 - 4) + (-2)(-1) = +2$
B	1	3	$(1 - 3)(3 - 4) = (-2)(-1) = +2$
C	4	5	$(4 - 3)(5 - 4) = (1)(1) = +1$
D	6	5	$(6 - 3)(5 - 4) = (3)(1) = +3$
^(a) $M_x = 3$		$M_y = 4$	$\Sigma(x - M_x)(y - M_y) = +8$
^(c) $\Sigma(x - M_x)^2 = 4 + 4 + 1 + 9 = 18$			
^(d) $\Sigma(y - M_y)^2 = 1 + 1 + 1 + 1 = 4$			

$$^{(e)}r = \frac{\Sigma(x - M_x)(y - M_y)}{\sqrt{\Sigma(x - M_x)^2 \Sigma(y - M_y)^2}} = \frac{8}{\sqrt{18 \times 4}} = \frac{8}{\sqrt{72}} = \frac{8}{8.48} = +.94$$

INFERENTIAL STATISTICS

To help interpret the meaning of correlations and the other descriptive statistics that flow from research results, psychological scientists rely on *inferential statistics*. For example, inferential statistics allowed many researchers to conclude that the benefits of EMDR are not great enough when compared with other treatment options to recommend it as a first choice in cases of anxiety.

Inferential statistics use certain rules to evaluate whether a correlation or a difference between group means is a significant finding or might have occurred just by chance. Suppose that a group of people treated with EMDR showed a mean decrease of 10 points on a posttreatment anxiety test, whereas the scores of a no-treatment control group decreased by a mean of 7 points. Does this 3-point difference between the groups' means reflect the impact of EMDR, or could it have been caused by random factors that made EMDR appear more powerful than it actually is? Traditionally, psychologists have answered questions such as this by using statistical tests to estimate how likely it is that an observed difference was due to chance alone (Krueger, 2001).

Differences Between Means: The *t* Test

One of the most important tools of inferential statistics is the *t* test. It allows a researcher to ask how likely it is that the difference between two means occurred by chance rather than being caused by the independent variable. When the *t* test or other inferential statistic says that the probability of chance effects is small enough (usually less than 5 percent), we say the results are *statistically significant*. Conducting a *t* test of statistical significance requires the use of three descriptive statistics.

The first part of the *t* test is the size of the observed effect, the difference between the means. Recall that the mean is calculated by summing a group's scores and dividing that total by the number of scores. In the example shown in Table 1, the mean of the high-incentive group is 94/13, or 7.23, and the mean of the low-incentive group is 65/13, or 5. So the difference between the means of the high- and low-incentive groups is $7.23 - 5 = 2.23$.

Second, we have to know the standard deviation of scores in each group. If the scores in a group are quite variable, the standard deviation will be large, meaning that chance may have played a large role in the results obtained. The next replication of the study might generate quite a different set of group scores. But, if the scores in a group are all very similar, then the standard deviation will be small, suggesting that the same result would likely occur for that group if the study were repeated. In other words, the apparent *difference* between groups is more likely to be statistically significant when each group's standard deviation is small. If variability is high enough that the scores of two groups overlap, the mean difference, though large, may not be statistically significant. (In Table 1, for example, some people in the low-incentive group actually did better on the math test than some in the high-incentive group.)

Third, we need to take the sample size, known as *N*, into account. The larger the number of participants or observations, the more likely it is that an observed difference between means is significant. This is so because, with larger samples, random factors within a group—the unusual performance of a few people who were sleepy or anxious or hostile, for example—are more likely to be canceled out by the majority, who better represent people in general. The same effect of sample size can be seen in coin tossing. If you toss a quarter five times, you might not be too surprised if heads comes up 80 percent of the time. If you get 80 percent heads after 100 tosses, however, you might begin to suspect that this is probably not due to chance alone and that some other effect, perhaps some bias in the coin, is significant in producing the results. (For the same reason, even a relatively small correlation coefficient—between diet and grades, say—might be statistically significant if it was based on 50,000 students. As the number of participants increases, it becomes less likely that the correlation reflects the influence of a few oddball cases.)

To summarize, as the differences between the means get larger, as N increases, and as standard deviations get smaller, t increases. This increase in t raises the researcher's confidence in the significance of the difference between means.

Let's now calculate the t statistic and see how it is interpreted. The formula for t is:

$$t = \frac{(M_1 - M_2)}{\sqrt{\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2} \left(\frac{N_1 + N_2}{N_1 N_2} \right)}}$$

where:

M_1 = mean of group 1

M_2 = mean of group 2

N_1 = number of scores or observations for group 1

N_2 = number of scores or observations for group 2

S_1 = standard deviation of group 1 scores

S_2 = standard deviation of group 2 scores

Despite appearances, working through this formula is quite simple. The numerator consists of the difference between the two group means; t will get larger as this difference gets larger. The denominator contains an estimate of the standard deviation of the *differences* between group means; in other words, it suggests how much the difference between group means would vary if the experiment were repeated many times. Because this estimate is in the denominator, the value of t will get smaller as the standard deviation of group differences gets larger. For the data in Table 1,

$$\begin{aligned} t &= \frac{(M_1 - M_2)}{\sqrt{\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2} \left(\frac{N_1 + N_2}{N_1 N_2} \right)}} \\ &= \frac{7.23 - 5}{\sqrt{\frac{(12)(5.09) + (12)(4.46)}{24} \left(\frac{26}{169} \right)}} \\ &= \frac{2.23}{\sqrt{.735}} = 2.60 \text{ with } 24 \text{ df} \end{aligned}$$

To determine what a particular t means, we must use the value of N and a special statistical table called, appropriately enough, the *t table*. We have reproduced part of the *t* table in Table 5.

First, we have to find the computed values of t in the row corresponding to the **degrees of freedom (df)** associated with the experiment. In this case, degrees of freedom are simply $N_1 + N_2 - 2$ (or two less than the total sample size or number of scores). Because our experiment had 13 participants per group, $df = 13 + 13 - 2 = 24$. In the row for 24 df in Table 5, you will find increasing values of t in each column. These columns correspond to decreasing p values, the probabilities that the difference between means occurred by chance. If an obtained t value is equal to or larger than one of the values in the *t* table (on the correct df line), then the difference between means that generated that t is said to be significant at the .10, .05, or .01 level of probability.

Suppose, for example, that an obtained t (with 19 df) was 2.00. Looking along the 19 df row, you find that 2.00 is larger than the value in the .05 column. This allows you to say that the probability that the difference between means occurred by chance was no greater than .05, or 5 in 100. If the t had been less than the value in the .05 column, the probability

degrees of freedom (df) The total sample size or number of scores in a data set, less the number of experimental groups.

TABLE 5 THE *t* TABLE

This table allows the researcher to determine whether an obtained *t* value is statistically significant. If the *t* value is larger than the one in the appropriate row in the .05 column, the difference between means that generated that *t* score is usually considered statistically significant.

df	<i>p</i> Value		
	.10 (10%)	.05 (5%)	.01 (1%)
4	1.53	2.13	3.75
9	1.38	1.83	2.82
14	1.34	1.76	2.62
19	1.33	1.73	2.54
22	1.32	1.71	2.50
24	1.32	1.71	2.49

of a chance result would have been greater than .05. As noted earlier, when an obtained *t* is not large enough to exceed *t* table values at the .05 level, at least, it is not usually considered statistically significant. The *t* value from our experiment was 2.60, with 24 df. Because 2.60 is greater than all the values in the 24 df row, the difference between the high- and low-incentive groups would have occurred by chance less than 1 time in 100. In other words, the difference is statistically significant.

Positive outcomes on tests of statistical significance are important, but they do not necessarily prove that a difference is important or “real” or that a particular treatment is effective or ineffective. Accordingly, psychologists who specialize in quantitative methods recommend that research findings be evaluated using other statistical analysis methods too (e.g., Kileen, 2005; Kline, 2004; Krueger, 2001). Whatever the methods, though, psychological scientists are more confident in, and pay the most attention to, correlations or other research findings that statistical analyses suggest are robust and not flukes.

Beyond the *t* Test

Many experiments in psychology are considerably more complex than simple comparisons between two groups. They often involve three or more experimental and control groups. Some experiments also include more than one independent variable. For example, suppose we had been interested not only in the effect of incentive size on performance but also in the effect of problem difficulty. We might then create six groups whose members would perform easy, moderate, or difficult problems and would receive either low or high incentives.

In an experiment like this, the results might be due to the size of the incentive, the difficulty of the problems, or combined effects (known as the *interaction*) of the two. Analyzing the size and source of such effects is often accomplished by using procedures known as *analysis of variance*. The details of analysis of variance are beyond the scope of this book. For now, note that the statistical significance of each effect is influenced by the size of the differences between means, by standard deviations, and by sample size in much the same way as we described for the *t* test. For more detailed information about how analysis of variance and other inferential statistics are used to understand and interpret the results of psychological research, consider taking courses in research methods and statistical or quantitative methods.

SUMMARY

Psychological research generates large quantities of data. Statistics are methods for describing and drawing conclusions from data.

Describing Data

Researchers often test the *null hypothesis*, the assertion that the independent variable will have no effect on the dependent variable.

Graphic representations such as *histograms* provide visual descriptions of data, making the data easier to understand.

Numbers that summarize a set of data are called descriptive statistics. Data can be described by three main types of descriptive statistics: a measure of central tendency, which describes the typical value of a set of data; a measure of variability, which describes the spread, or dispersion, among scores; and a *correlation coefficient*, which describes relationships between variables.

Measures of central tendency include the *mean*, *median*, and *mode*; variability is typically measured by the *range* and by the *standard deviation*. Sets of data often follow a *normal distribution*, which means that most scores fall in the middle of the range, with fewer and fewer scores occurring as one moves toward the extremes. In a truly normal distribution, the mean, median, and mode are identical. When a set of data shows a normal

distribution, a data point can be cited in terms of a *percentile*, which indicates the percentage of people or observations falling below a certain score, and in terms of *standard scores*, which indicate the distance, in standard deviations, between any score and the mean of the distribution.

Inferential Statistics

Researchers use inferential statistics to quantify the probability that conducting the same experiment again would yield similar results.

One inferential statistic, the *t test*, assesses the likelihood that differences between two means occurred by chance or reflect the impact of an independent variable. Performing a *t test* requires using the difference between the means of two sets of data, the standard deviation of scores in each set, and the number of observations or participants. Interpreting a *t test* requires that *degrees of freedom* also be taken into account. When the *t test* indicates that the experimental results had a low probability of occurring by chance, the results are said to be statistically significant.

When more than two groups must be compared, researchers typically rely on analysis of variance in order to interpret the results of an experiment.

APPENDIX B

Behavioral Genetics

Think about some trait that distinguishes you from other people, a trait on which you feel you are well above or well below average. Perhaps you would think about your skill at sports, languages, or music, or maybe your fearfulness, sociability, or other aspects of your personality. Have you ever wondered what made you the way you are? If you are shy, for example, it is easy to come up with possible environmental explanations. You might be shy because as a child you had few chances to meet new kids or because you had embarrassing or unpleasant experiences when you did meet them. Maybe you have shy parents who served as the role models you imitated. Such environmental explanations are reasonable, but it is also possible that you inherited a tendency toward shyness from your parents. It is even more likely that both inheritance and environment shaped your shyness.

Topics such as these are studied by researchers in the field of *behavioral genetics*, the study of how genes affect behavior. These researchers have developed methods to explore genetic, as well as environmental, origins of behavioral differences among people. The results of behavioral genetics research make it clear that heredity has a significant influence, not just on shyness but on personality more generally, on cognitive abilities, on psychological disorders, and on many other aspects of human behavior and mental processes. However, behavioral genetics is just as much the study of environment as of genetics. In the process of trying to disentangle genetic from environmental factors, researchers have made several important discoveries about the impact of the environment.

In this appendix, we discuss behavioral genetics in more detail than we did in the chapter on research in psychology. We begin with a review of the biochemical mechanisms underlying genetics and heredity. We then offer a brief history of genetic research in psychology, followed by a discussion of what research on genetic influences can and cannot tell us about the origins of human differences. Finally, we describe some findings from behavioral genetics research that illuminate several important aspects of human behavior and mental processes.

THE BIOLOGY OF GENETICS AND HEREDITY

What does it mean to say that someone has inherited a physical feature or behavioral trait? The answer lies in **genetics**, the biology of inheritance. The story begins with the biochemistry of human cells, and tiny structures called chromosomes, found in every cell of your body. Most human cells have forty-six chromosomes, arranged in twenty-three matching pairs. These **chromosomes** are like long, thin strands made up of thousands of segments, called genes. **Genes** are the biochemical units of heredity. Each gene guides the development of an individual by telling a cell how to make different proteins. Genes are made of **DNA (deoxyribonucleic acid)**—a grouping of sugar, phosphate, and four kinds of nitrogen-containing molecules twisted around each other in a double spiral (see Figure 1).

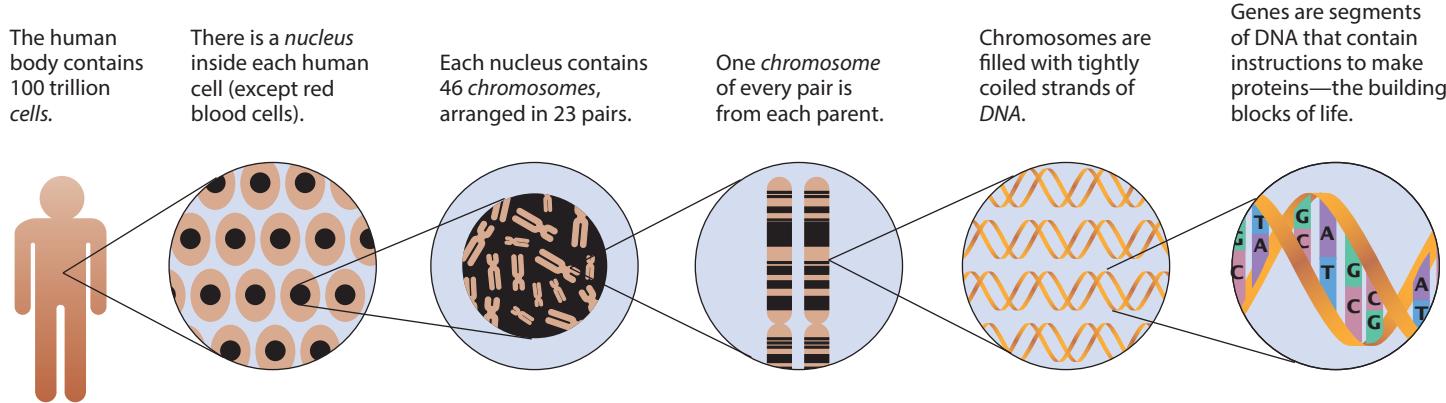
The exact mechanism by which genes work remains a subject of intensive research. Here's what we know so far. The structure of a gene—as seen in the particular order in which the four nitrogen-containing molecules are arranged in that segment of DNA—determines, through the production of **RNA (ribonucleic acid)**, which protein the gene says to produce. (A typical gene may produce any one of several proteins, depending on other factors.) Protein molecules, in turn, form the physical structure of each cell and also direct the activity of the cell. So DNA essentially uses a coded message to provide a

genetics The biology of inheritance.

chromosomes Long, thin structures in every biological cell that contain genetic information.

genes The biological instructions, inherited from both parents and located on the chromosomes, that provide the blueprint for physical development.

DNA (deoxyribonucleic acid) The material that makes up chromosomes and provides the genetic code.

**FIGURE 1****Genetic Building Blocks**

Only about 3 percent of DNA contains genes, though some of the rest of it affects how and when each gene actually works to guide the production of proteins. Together, genes and non-gene material in DNA essentially determine all the inherited aspects of our physical bodies and influence many of our behavioral characteristics, too.

Source: "Genetic Building Blocks" from Time, January 17, 1994.

blueprint for constructing and controlling every physical aspect of a human being, including eye color, height, blood type, inherited disorders, and the like—and all in less space than the period that ends this sentence.

New cells are constantly being produced when existing cells divide. Usually, the body's cells divide through a process called *mitosis*, in which the cell's chromosomes duplicate themselves so that each new cell exactly contains copies of the twenty-three pairs of chromosomes in the original.

A different kind of cell division occurs when a male's sperm cells or a female's egg cells (called *ova*) are formed. This type of cell division is called *meiosis*. In meiosis, chromosome pairs are not copied. Instead, they randomly split up and rearrange themselves, leaving each new sperm and egg cell with just one member of each chromosome pair, or twenty-three single chromosomes. No two of these special new cells are quite the same, and none contains an exact copy of the person who produced it. So at conception, when a male's sperm cell fertilizes the female's ovum, a truly new cell is formed. This fertilized cell, called a *zygote*, carries twenty-three pairs of chromosomes—half of each pair from the mother and half from the father. The zygote represents a unique heritage, a complete genetic code for a new person using genes from each parent. As described in the chapter on human development, the zygote divides first into copies of itself and later into the trillions of specialized cells to form a new human being.

Not all genes express themselves in the person who carries them. *Dominant* genes are outwardly expressed whenever they are present. *Recessive* genes are expressed only when they are paired with a similar gene from the other parent. For example, phenylketonuria (PKU)—a disorder seen in about 1 in 10,000 newborns—is caused by a recessive gene. When inherited from both parents, the protein from this gene disrupts the body's ability to control phenylalanine, an amino acid found in milk and other foods. As a result, phenylalanine is converted into a toxic substance that can cause severe intellectual disability. (Discovery of this genetic defect made it possible to prevent such disability in children with PKU simply by making sure they did not consume foods high in phenylalanine.) PKU is one of more than 4,000 single-gene disorders, but in fact, relatively few human characteristics are controlled by just one gene. Most characteristics are **polygenic traits**, meaning that they are affected by many genes. Even a person's eye color and height are affected by more than one gene.

The genes contained in the forty-six chromosomes inherited from parents make up an individual's **genotype**. Because identical twins develop from one fertilized egg cell, they are said to be *monozygotic*; they have exactly the same genotype. So why aren't all identical twins exactly alike? Because they do not have exactly the same environment. An individual's **phenotype** is the set of observable characteristics that result from the combination of heredity and environment. In twins and nontwins alike, the way people actually look

polygenic traits Characteristics that are determined by more than one gene.

genotype The full set of genes, inherited from both parents, contained in twenty-three pairs of chromosomes.

phenotype How an individual looks and acts, which depends on how inherited characteristics interact with the environment.

and act is influenced by the combination of genes they carry, as well as by environmental factors—in other words, by both nature and nurture.

A BRIEF HISTORY OF GENETIC RESEARCH IN PSYCHOLOGY

The field now known as behavioral genetics began in the late 1800s with the work of Sir Francis Galton. A cousin of Charles Darwin, Galton was so impressed with Darwin's book on evolution that he decided to study heredity in the human species, especially as it relates to human behavior. Galton suggested the family, twin, and adoption study designs that remain mainstays of human behavioral genetics research today. He even coined the phrase *nature-nurture* to refer to genetic and environmental influences. Galton's most famous behavioral genetics study was one in which he showed that genius runs in families. Unfortunately, Galton went too far in interpreting the evidence from this family study when he concluded that "nature prevails enormously over nurture" (Galton, 1883, p. 241). As noted in the chapter on research in psychology, family members can be similar to each other because of environmental, as well as hereditary, factors. Galton failed to take into account the fact that similarity among family members in characteristics such as genius could be traced to the environments family members share, to their shared genes, or both. Yet, Galton's work helped focus psychologists' interest on the influence of genetics and on the effort to separate nature from nurture to learn why people resemble or differ from each other.

The first two studies aimed at separating nature and nurture by studying twins and adoptees were conducted in 1924. Both focused on IQ, and both suggested that genetics make important contributions to intelligence. However, two factors limited research on the influence of genetics on behavior and mental processes. The first factor was the dominant impact of John B. Watson's behaviorism in the 1920s. As mentioned in the introductory chapter, behaviorism suggested that we are only what we learn. In 1925, Watson insisted that "there is no such thing as an inheritance of capacity, talent, temperament, mental constitution and characteristics. These things again depend on training that goes on mainly in the cradle" (Watson, 1925, pp. 74–75). The second factor that discouraged attention to human genetics was *eugenics*, the notion that the human race can be improved by promoting the reproduction of those with "desirable" traits and reducing reproduction by less "desirable" people. This social philosophy had become mainstream thinking in the United States, Great Britain, and elsewhere. It led to compulsory sterilization of those deemed "unfit" and reached its extreme in Germany under the Nazi regime of Adolf Hitler. The idea that certain groups of people were "genetically inferior" led to the Holocaust during World War II, a campaign of genocide during which millions of Jews and other alleged "inferior" people were killed.

Genetic research on human behavior shrank to a trickle during the 1930s and 1940s. Then, animal research led to the 1960 publication of the first behavioral genetics textbook (Fuller & Thompson, 1960) and renewed interest in human genetics. In 1963, an influential article reviewed family, twin, and adoption findings and concluded that genetic factors are an important influence on IQ (Erlenmeyer-Kimling & Jarvik, 1963). Around that time, the first adoption study of schizophrenia showed a strong genetic contribution to that disorder (Heston, 1966).

In the early 1970s, however, interest in human behavioral genetics among psychologists faded again, this time because of reactions to two publications. The first was a paper by Arthur Jensen, in which he said that differences in average IQ between blacks and whites might be partly due to genetic factors (Jensen, 1969). The second was a book by Richard Herrnstein, in which he argued that genetics might contribute to social class differences (Herrnstein, 1973). The public and scientific furor over these publications—which included branding the authors as racists— inhibited genetic research in psychology,

even though very few behavioral geneticists had studied ethnic or class differences. It was some time until major genetic studies were again conducted in psychology.

Today most psychologists recognize the role of both genetics and environment in behavior and mental processes, including the controversial area of cognitive abilities. By 1992 the American Psychological Association selected behavioral genetics as one of two themes best representing the past, present, and especially the future of psychological research (Plomin & McClearn, 1993). To some, though, the study of human behavioral genetics still carries a taint of racism and class elitism. Such concerns were resurrected by *The Bell Curve*, a book arguing for a role of genetics in ethnic differences in intelligence, and subsequent implications for social class structure (Herrnstein & Murray, 1994). Fortunately, reaction to that book has re-emphasized the need to balance the roles of both nature and nurture in psychology.

THE FOCUS OF RESEARCH IN BEHAVIORAL GENETICS

Much of the controversy about behavioral genetics and about nature and nurture in general comes from misunderstandings about what behavioral genetics researchers study and, more specifically, what it means to say that genes influence behavior.

For one thing, behavioral genetics is the study of genetic and environmental factors that are responsible for *differences* among individuals or groups of individuals, not for the characteristics of a single individual. Consider height, for example. Identical twins are much more similar in height than are fraternal twins (who share no more genes than other siblings), and individuals who are genetically related but raised separately are just as similar in height as are relatives who are raised together. Further, genetically unrelated individuals who are raised together are no more similar in height than random pairs of individuals. These data suggest, not surprisingly, that height is highly *heritable*. This means that much of the *variability* in height that we see among people—actually about 80 percent of it—can be explained by genetic differences among them rather than by environmental differences. (It does not mean that a person who is six feet tall grew 80 percent of that height because of genes and the other 20 percent because of environment!) It also follows that if a person is, say, shorter than average, genetic reasons are probably the primary cause. We say “probably” because finding a genetic influence on height involves referring only to the origins of average individual differences in the population. So although the difference in people’s heights is attributable mainly to genetic factors, a particular person’s height could be due mainly to an early illness or other growth-stunting environmental factors. For example, Hattie and Samantha Peters, a pair of identical twins, were exposed to a rare condition in their mother’s womb that deprived Samantha of vital nutrients. As a result, Hattie is 5 feet 4 inches tall, but Samantha is only 4 feet 8 inches (Taggart, 2004).

To see how the logic of behavioral genetics applies to conclusions about psychological characteristics, suppose a researcher found that the heritability of a certain personality trait is 50 percent. This result would mean that approximately half of the differences among people on that trait are attributable to genetic factors. It would not mean that each person inherits half of the trait and gets the other half from environmental influences. As in our height example, behavioral geneticists want to know how much variability among people can be accounted for by genetic and environmental factors. The results of their research allow generalizations about the influence of nature and nurture on certain characteristics, but those generalizations do not necessarily apply to the origin of a particular person’s characteristics.

Another misconception about genetic influences is that they are “hard-wired” and so their effects are inevitable. Instead, in most cases, a particular genetic makeup does not guarantee that a person will develop a particular condition, but only that the person’s *chance* of developing that condition is higher or lower. Further, complex traits—intelligence,

for example—are influenced by many genes, as well as by many environmental factors. So genetic influence means just that—*influence*. Genes can affect a trait without completely determining whether or not it will appear.

THE ROLE OF GENETIC FACTORS IN PSYCHOLOGY

In the following sections, we consider behavioral genetics research results that tell a little more of the story about how genes can have an impact on behavior and mental processes.

Genetic Influences over the Life Span

One particularly interesting finding about genetic influences on general cognitive ability is that these influences accumulate throughout a life span (Finkel & Reynolds, 2014). Thus, the proportion of individual differences (variance) in IQ scores that can be explained by genetic factors increases from 40 percent in childhood to 60 percent in adolescence and young adulthood and then to 80 percent later in life. This increase in the magnitude of genetic influence can be seen, for example, in the expanding difference between IQ correlations for identical twins and those for fraternal twins: Identical twins become more similar in IQ over the life span, whereas fraternal twins become less similar as the years go by. This finding is all the more interesting in light of the common assumption that environmental influences become increasingly important as accidents, illnesses, and other experiences accumulate throughout life.

How can it be that genetic influences become more important over time? One possible explanation is that, as discussed later, genetic predispositions lead people to select, and even create, environments that foster the continued development of their genetically influenced abilities.

Genes Affecting Multiple Traits

Behavioral genetics research has also revealed that genes affecting one trait can sometimes affect others as well. For example, it appears that the same genetic factors that affect anxiety also affect depression (Kendler, Neale, et al., 1992; Kendler et al., 2003). So if we could identify specific genes responsible for genetic influences on anxiety, we would expect to find that the same genes were associated with the appearance of depression. Similarly, genetic factors affecting substance dependence are highly correlated with genetic factors affecting antisocial behavior and impulsive style (Kendler et al., 2003; Krueger et al., 2002).

A similar finding has emerged for cognitive ability and scholastic achievement. Tests of scholastic achievement show almost as much genetic influence as do tests of cognitive ability. Moreover, tests of scholastic achievement correlate substantially with tests of cognitive ability. To what extent is a common set of genes responsible for this overlap? Research suggests that the answer is “almost entirely.” It appears that the genes that influence performance on mental ability tests are the same ones that influence students’ performance at school (Wadsworth, 1994).

Identifying Genes Related to Behavior

One of the most exciting developments in behavioral genetics involves identifying specific genes responsible for genetic influences in psychology. For example, in the case of PKU discussed earlier, there are hundreds of rare, single-gene disorders that affect behavior. One of these is *Huntington’s disease*, an ultimately fatal disease that involves loss of motor control and progressive damage to the central nervous system. Huntington’s disease emerges only in adulthood, beginning with personality changes, forgetfulness, and other behavioral problems. It is caused by a single dominant gene whose identification in 1983

made it possible to determine who will get this disease—even though the biochemical mechanisms underlying the disorder are still not fully understood and prevention is not yet possible.

Researchers are also tracking down the several genes involved in the appearance of Alzheimer's disease. (As described in the chapter on biological aspects of psychology, this disease causes memory loss and increasing confusion in many older people.) One of these, a gene that predicts risk for late-onset Alzheimer's disease, was identified in 1993. This gene increases the risk for Alzheimer's disease as much as thirty times (Farrer et al., 1997), but its presence is neither necessary nor sufficient for the disease to appear. In fact, this gene's influence is different depending on what part of the world a person lives in (Crean et al., 2011). Thus, many people with Alzheimer's disease do not have the gene, many people with the gene do not have the disease, and the gene's effect must interact with other factors as well. Nonetheless, this gene's discovery marks a process in which specific genes—or regions of DNA near specific genes—are being identified as influencing disorders and psychological traits.

Progress in identifying specific genes in humans has been slow, in part because research ethics and common sense prevent use of selective breeding. Accordingly, human studies have lacked the statistical power needed to detect subtle but potentially important genetic influences on behavior. However, the more powerful genetic research techniques available in studies of animals have identified several genes associated, for example, with fearfulness (Saiz et al., 2008), sensitivity to drugs such as alcohol (Wall et al., 2005), and various aspects of learning and memory (Wahlsten, 1999). In most cases, however, such associations are tendencies rather than certainties—they are indicators that are not necessarily definitive.

Today's efforts to identify genes related to human behavior are being aided by advances flowing from the Human Genome Project, which in early 2001 succeeded in identifying the sequence of most of the 3 billion "letters" of DNA in the human genome. One of the most surprising findings of that project so far is that the human genome appears to contain only about 20,000 to 25,000 genes—less than half the number expected, and a number that is similar to the estimates for animals such as mice and worms (International Human Genome Sequencing Consortium, 2004). Does this smaller-than-expected number of human genes mean that there are too few to influence all aspects of human behavior, and that the environment (*nurture*) must be even more important than we thought in this regard? Not necessarily. It may be that the greater complexity seen in human behavior versus, say, mouse behavior stems not from the number of genes we have but from the greater complexities in how we decode our genes into proteins. Human genes, more than the genes of other species, are spliced in alternative ways, giving us a greater variety of proteins. It may be that this more subtle variation in genes—not the number of genes—creates the differences between mice and people. Such a possibility has important implications for behavioral genetics because if the obvious differences between humans and other species are due to subtle DNA differences, then individual differences *within* our species—in other words, among people—are likely to involve genetic factors that are even more subtle and hard to find.

Fortunately, new techniques make it possible to detect DNA differences for many thousands of genes simultaneously. These techniques help to identify genes related to behavior, a process that will fill in the causal picture about a variety of characteristics and disorders that are influenced by many genes and many environmental factors. But it might not just be the actions of multiple genes that have a major impact on behavior. It might also be a gene-environment interaction—the combination of a specific gene in a specific environment—that has the greatest influence on behavior. Examples of such interactions appear in research by Avshalom Caspi and his colleagues (Caspi et al., 2002; Caspi et al., 2003; Jaffee et al., 2007). In one study, they found that children living in an environment in which there is abuse or other maltreatment were at increased risk for displaying antisocial

behavior in later life. But the at-risk children who also had a particular gene did not become antisocial. It was as if the gene protected them against this common consequence of childhood maltreatment. A second study showed that, although depression and suicide are often associated with stressful life events, variation in a particular gene could predict whether people became depressed and suicidal in response to such events (Caspi et al., 2003). Understanding how multiple genes combine to influence behavior and analyzing gene-environment interactions will continue to be active and exciting areas of research in behavioral genetics.

BEHAVIORAL GENETICS AND ENVIRONMENTAL INFLUENCES

As suggested earlier, research on genetic influences in psychology has also provided some of the best evidence for the importance of environmental influences. It has shown that even though genetic influences are important, they cannot explain everything about human behavior.

For example, twin and adoption studies demonstrate the importance of genetic factors in schizophrenia, and as a result, many researchers are looking for the specific genes responsible. Enthusiasm for genetic explanations of schizophrenia makes it easy to forget, however, that environmental factors can be at least as important as genes. As described in the chapter on psychological disorders, when one member of an identical-twin pair is schizophrenic, the chances are about 40 percent that the other member of the pair is also schizophrenic, a rate that is much higher than the 1 percent rate of schizophrenia in the general population. This result surely means that there is a strong genetic contribution to schizophrenia, but it also indicates that schizophrenia must be strongly influenced by the environment. After all, most of the time, the identical twin of a person with schizophrenia will not show the disorder. Such differences within pairs of identical twins can be due only to the operation of environmental factors.

In fact, research generally suggests that genetic factors account for only about half of the variance among individuals for psychological characteristics such as personality and psychopathology. Therefore, at least half of the variance among individuals on these characteristics must be due to environmental factors. Such environmental—or more properly, *nongenetic*—factors span everything other than genetic inheritance. They include such biological factors as prenatal events, nutrition, and illnesses, as well as more traditional environmental factors such as parenting, schooling, and peer influences.

In short, one of the most important findings emerging from behavioral genetics research concerns the environment, not genetics. Research suggests that the most important environmental influences are likely to be those that different family members do not share (Plomin, Asbury, & Dunn, 2001). Psychologists want to find out more about these *non-shared factors* and how they act to create differences in children—twins or not—who grow up in the same family.

So far, research on this topic has shown that children may grow up in the same family yet experience quite different environments, especially in relation to their parents (Brody, 2004). Siblings perceive that their parents treat them very differently—and observational studies back up these perceptions of differential treatment (Plomin, Asbury, & Dunn, 2001). Even events such as parental divorce, which would seem to be shared equally by all children in the family, are experienced differently by each child, depending especially on age, personality, and the nature of the relationship with each parent.

Research is also beginning to focus on environmental influences beyond the family—such as relationships with teachers or friends—which are even more likely than home-related

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factors to vary among siblings. If you have a brother or sister, think about a psychological trait on which you and your sibling differ—confidence, for example. Why do you think you two are different on that trait? Perhaps one of you experienced a loss of self-confidence when faced with a demanding grade-school teacher or after being betrayed by a childhood friend. Did such differing experiences occur randomly and thus make you more confident or less confident than your sibling? Or do you think that differences in your genetic makeups helped bring about these different experiences? Remember, unless you and your sibling are identical twins, you share only about 50 percent of your genes. Perhaps genetically influenced differences between the two of you—in emotionality or other aspects of temperament, for example—caused parents, peers, and others to respond to each of you differently. This brings us to a key major discovery about the environment that has emerged from research on behavioral genetics: Environmental influences associated with differences between siblings might actually be the *result* of genetic differences between the siblings.

Most of the measures used by psychologists to assess what might be thought of as environmental factors have now been shown to be influenced by genetic factors (Plomin & Bergeman, 1991). These include measures such as adolescents' ratings of how their parents treated them, observations of parent-child interactions, and questionnaires about life events and social support. If scores on measures such as these reflected only environmental factors, then the scores of identical twins should be no more similar to each other than those of fraternal twins. Also, there should be little similarity in environmental-experience measures for genetically related individuals who grew up in different families.

But results reported by behavioral geneticists defy such expectations. For example, parents differ in how responsive they are to their children, but such differences in responsiveness correlate with the children's intelligence—a trait that has a clear genetic component. So, as described in the chapters on intelligence and human development, parental responsiveness affects cognitive development, and—as behavioral genetics research suggests—children's inherited intellectual abilities in turn can alter their parent's responsiveness. In other words, parents tend to be more responsive to bright children who ask lots of questions and are interested in the answers.

Outside the family, too, genetic factors also play a role in generating environmental experiences. For example, research on the characteristics of children's peer groups shows that children tend to choose their friends—and to be chosen as friends—partly based on genetically influenced traits, such as mental ability and temperament (Manke et al., 1995). Several studies also suggest that genetic factors can increase or decrease the likelihood of family conflicts and other social stressors that threaten one's physical and psychological well-being (Karevold et al., 2009; Reiss et al., 2000). In addition, genetic influences on personality can account for the genetic effects seen in adults' reports about their family environments when growing up (Krueger, Markon, & Bouchard, 2003).

An important implication of genetic influences on environmental events is that measuring the impact of family relationships, peer influences, and other environmental factors on behavior and mental processes may be less straightforward than at first it may seem. A measure that is aimed at assessing an "environmental" factor may also be affected by the genetic characteristics of the people being studied.

Clearly, in human development, nature and nurture work together. Children select, modify, and create environments that are correlated with their genetic inclinations. As developmental psychologists have long argued, children are not formless blobs of raw clay passively molded by the environment. Rather, they are active participants and architects in their experiences. The new findings we have described here suggest that genetics plays an important role in those experiences.

SUMMARY

Behavioral genetics is the study of how genes affect behavior.

The Biology of Genetics and Heredity

Research on the ways in which nature and nurture interact to shape behavior and mental processes requires knowledge of *genetics*, the biology of inheritance. The genetic code that transmits characteristics from one generation to the next is contained in the *DNA (deoxyribonucleic acid)* that makes up the *genes* that in turn make up *chromosomes*. Dominant genes are expressed whenever they are present; recessive genes are expressed only when inherited from both parents. Most human characteristics are controlled by more than one gene; they are *polygenic traits*. The genes in a person's forty-six chromosomes make up the *genotype*. The *phenotype*—how people actually look and act—is influenced by genes and the environment.

A Brief History of Genetic Research in Psychology

Sir Francis Galton's work in the nineteenth century helped to stimulate psychologists' interest in the influence of genetics on behavior. The popularity of research in this area has waxed and waned over the years, but today most psychologists recognize the role of genetic, as well as environmental, influences on many aspects of behavior and mental processes.

The Focus of Research in Behavioral Genetics

Behavioral genetics research identifies the genetic and environmental factors responsible for differences among individuals, not for the characteristics of a particular person. Although genes can

influence a trait, they may not completely determine whether that trait appears.

The Role of Genetic Factors in Psychology

Genetic factors probably influence, to some extent, every aspect of behavior and mental processes.

Genetic influences on general cognitive ability appear to increase over time, possibly because genetic predispositions lead people to select and even create environments that foster the continued development of abilities that are in line with those predispositions.

Genes that affect one trait, such as anxiety, can sometimes also affect other traits, such as depression.

Current research in behavioral genetics, aided by findings from the Human Genome Project, is identifying specific genes responsible for specific characteristics—especially rare, single-gene disorders such as Huntington's disease. It is also illuminating gene-environment interactions.

Behavioral Genetics and Environmental Influences

Research in behavioral genetics has actually provided evidence for the importance of environmental influences, too, because the research shows that genetics alone cannot account for such characteristics as intelligence, personality, and psychological disorders. Some of the most important environmental influences are likely to be those that members of the same family do not share. In short, neither nature nor nurture is conducting the performance of the other: They are playing a duet.

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SUBJECT INDEX/GLOSSARY

These key terms correspond to those in the American Psychological Association thesaurus and dictionary. Key terms, which appear in boldface, are followed by their definitions.

A

Ability, industrial and organization assessment of, 629

Abnormality

- classifying psychological disorders, 435–436
- defining, 492–493
- determining causes of, 493–494

Absenteeism, 650

Absolute threshold *The minimum amount of stimulus*

energy that be detected 50 percent of the time, 90

Acceptance and commitment therapy (ACT), 546

Accessory structures *Structures, such as the outer part of the ear, that modify a stimulus*, 88

Accidental reinforcement, 157

Accidents in the workplace, 654

Accommodation cues, 121

Accommodation *The process of modifying schemas when they do not work on new objects*, 383–384

Acetylcholine, 78, 206

- emotional response and, 360

Achievement

- success in the workplace and, 353
- well-being and, 353–354

Achievement motivation (need for achievement) *The degree to which a person establishes specific goals, cares about meeting them, and experiences satisfaction by doing so*, 350–351

- development of, 351–352

Acoustic memory *Mental representations of stimuli as sounds*, 179

Acoustic nerve *The bundle of axons that carries messages from the hair cells of the cochlea to the brain*, 101

ACTH, 82

Action potential *An abrupt wave of electrochemical changes traveling down an axon when a neuron becomes depolarized*, 53

Action tendency, 358

Activation-synthesis theory of dreams, 308

Active learning, 172–173

Actor-observer effect *The tendency to attribute other people's behavior to internal causes while attributing one's own behavior to external causes*, 583–584

Actual criterion, 632–633

Actualizing tendency *An innate inclination toward growth and fulfillment that motivates all human behavior*, 474

Acupuncture, pain relief from, 112–113

Adam, 320

Adaptation, 141

Addiction *Development of a physical need for a psychoactive drug*, 315, 530–532

Additive color mixing, 96

A-delta fibers, 110

Adler, Alfred, 461

Adolescents

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- love and sex, 409
- milestones of, 420
- moral development of, 411–413
- physical changes of, 407–408
- violent, 409–410

Adoption, homosexuality and, 348

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inheritability of schizophrenia, 521

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Adrenocorticotrophic hormone. *See ACTH*

Adulthood

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- milestones of, 420
- physical changes in, 413–414
- social changes in, 416–419

Advertising, cultural values in, 22

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Age, job satisfaction and, 647

Age Discrimination in Employment Act, 638

Age-graded testing items, 259

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Aggression, 606–607. *See also Aggressive behavior*

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learning and cultural mechanisms of, 608

observational learning and, 167–171

relationship of with frustration, 609–610

road rage, 431

temperature and, 611

video games and, 608–609

workplace, 651

Aggressive behavior (aggression) *An act that is intended to harm another person*, 606–611. *See also Aggression*

Agonists *Drugs that bind to a receptor and mimic the effects of the neurotransmitter that normally fits that receptor*, 313

Agoraphobia *A strong fear of being alone or away from the safety of home*, 504

Agreeableness, 465

Alcohol, 316–317

- prenatal exposure to, 379

Alcohol abuse. *See Alcohol use disorder*

Alcohol dependence. *See Alcohol use disorder*

Alcoholism *A pattern of drinking that may lead to addiction and that almost always causes severe social, physical, and other problems*, 530–531

Alcohol use disorder, 530–531

Alderfer, Clayton, 355

Alexia without agraphia, 668

Algorithms *Systematic procedures that cannot fail to produce a correct solution to a problem*, 228

All-or-none thinking, 551

Allport, Gordon, 464

Alston, J. Henry, 21

Altered state of consciousness *A condition that exists when changes in mental processes are extensive enough to produce noticeable differences in psychological and behavioral functioning*, 299

hypnosis and, 310

Alternative hypotheses, use of correlational studies to evaluate, 34–35

Altruism *An unselfish concern for another's welfare*, 611–616

Alzheimer's disease *Dementia resulting from a neurodegenerative disease characterized by the loss of cognitive functions*, 206, 416, 686–687

aphasia due to, 683

disruption of acetylcholine, 78

Amabile, Theresa, 239–240

Ambiguity, conformance and, 600

Ambivalent relationship, 396

American Sign Language, use of by primates, 251–252

Americans with Disabilities Act, 638

Amino acids, 336

Amnesia

anterograde, 207–208

dissociative, 510

infantile, 389

posthypnotic, 310

retrograde, 208–210

Amnesia mild cognitive impairment, 686

Amnestic disorders *Neuropsychological disorders that involve memory loss*, 673–675. *See also Amnesia*

Amphetamines, 318

Amplitude *The distance between the peak and the baseline of a wave*, 92–93

Amygdala *A structure in the forebrain that, among other things, associates features of stimuli involved in memory and emotion*, 61, 359

Amyloid cascade hypothesis of Alzheimer's disease, 686–687

Analgesia *Reduction in the sensation of pain in the presence of a normally painful stimulus*, 111

Analgesics, natural, 111–112

Analogies

recognition of and brain activity, 70

use of in problem solving, 232

Anal stage *The second of Freud's psychosexual stages, in which the focus of pleasure shifts from the mouth to the anus*, 460

Analytic intelligence, 277–279

Analytic psychology, 461

Anchoring bias (anchoring heuristic) *A shortcut in the thought process that involves adding new information to existing information to reach a judgment*, 230, 236

Androgens *Masculine hormones that circulate in the bloodstream*, 81, 346

Anger, facial expressions indicating, 367–368

Animals

ethical guidelines for psychological research on, 46

personalities of, 466

Anomia, 687

Anorexia nervosa *An eating disorder characterized by self-starvation and dramatic weight loss*, 341

Anosognosia, 677–679

Antagonists *Drugs that bind to a receptor and prevent the normal neurotransmitter from forming*, 313

Anterograde amnesia *A loss of memory for events that occur after a brain injury*, 207–208, 674–675

Antibodies, 446

- Antidepressant medications** Medications that reduce the symptoms of depression, 565–566
- Antipsychotic medications** Medications that relieve the symptoms of schizophrenia and other severe psychological disorders, 564–565
- Anti-seizure medications, 566
- Antisocial personality disorder** A long-term, persistent pattern of impulsive, selfish, unscrupulous, even criminal behavior, 525–526
- selfish, unscrupulous, even criminal behavior, exploring links between child abuse and, 525–526
- Anvil, 100
- Anxiety, effect of on insomnia, 301
- Anxiety disorders** Conditions in which intense feelings of fear and dread are long-standing or disruptive, 504–505, 511–512
- learning and, 507–508
- Anxiolytics** Medications that reduce tension and symptoms of anxiety, 566
- Anxious-fearful cluster of personality disorders, 524
- Aphasias** Neuropsychological disorders in which there are disruptions in the ability to speak, read, write, and understand language, 65–66, 683–684
- Appetite, 338–339
- Applied behavior analysis, 546
- Approach-approach conflicts, 356
- Approach-avoidance conflicts, 356
- Apraxia** Neuropsychological disorder in which there are impairments in the ability to perform or coordinate a previously learned motor skill, 684–685
- Aprosodia, 684
- Aristotle, 11
- Army Alpha test, 260
- Arousal:cost-reward theory** A theory attributing people's prosocial behavior to their effects to reduce unpleasant arousal in the face of someone's need or suffering, while also considering the costs involved, 612
- Arousal level, intelligence testing and, 266–267
- Arousal theory** A theory that people are motivated to maintain what is an optimal level of arousal for them, 332–333
- Arrendondo, Carlos, 611
- Artificial intelligence (AI)** The field that studies how to program computers to imitate the products of human perception, understanding, and thought, 19, 237–239
- Arvey, Richard, 648–649
- Asch, Solomon, 599
- Asperger's disorder, 529. *See also* Autism spectrum disorder
- Assertiveness training** A set of methods for helping clients learn to express their feelings and stand up for their rights in social situations, 547
- Assessment center** An extensive set of exercises designed to determine an individual's suitability for a particular job, 631–632
- Assimilation** The process of taking in new information about objects by using existing schemas on objects that fit those schemas, 383
- Association cortex** The parts of the cerebral cortex that receive information from more than one sense or that combine sensory and motor information to perform complex cognitive tasks, 65–66
- Assumptions, 228–229
- Astringent, 107
- Asylums, 495
- Ataques de nervios, 496
- Attachment** A deep, affectionate close, and enduring relationship with a person with whom a baby has shared many experiences forming, 395
- variations in, 395–396
- close, and enduring relationship with a person with whom a baby has shared many experiences, 394–395
- Attachment behavior** Actions such as crying, smiling, vocalizing, and gesturing that help bring an infant into closer proximity to its caretaker, 395–396
- Attachment patterns, consequences of, 396–397
- Attachment theory** The idea that children form a close attachment to their earliest caregivers and that this attachment pattern can affect aspects of the children's later lives, 394, 461–462
- Attention deficit hyperactivity disorder (ADHD), 528–529
- Attention** The process of directing and focusing certain psychological resources to enhance perception, performance, and mental experience, 131
- characteristics of, 131–132
- directing, 132–133
- dividing, 133–134
- measuring changes in control of across the life span, 283
- selective, 185
- Attention to stimuli, 147
- Attitude** A tendency toward a particular cognitive, emotional, or behavioral reaction to objects in one's environment, 585
- Attitudes
- changing, 585–588
 - components of, 585
 - forming, 585, 588
- Attraction
- environmental influence on, 593
 - physical attractiveness and, 594
 - similarity and, 593–594
- Attributional errors, 582–584
- Attribution in social psychology** The process of explaining the causes of people's behavior, including our own, 582
- errors in, 582–584
- Attribution** The process of explaining the cause of some event, 364–365
- Atypical antipsychotics, 565
- Auditory cortex, 65
- Auditory memory** Mental representations of stimuli as sounds, 179
- Auditory pathways to the brain, 102
- Authoritarianism, 589
- obedience and, 604
- Authoritarian parents** Parents who are firm, punitive, and unsympathetic, 400
- Authoritative parents** Parents who reason with their children and are firm but understanding, 400
- Autism spectrum disorder, 529–530
- positive reinforcement for children with, 547–548
- Autoimmune disorders, 446
- Automatic thinking, 221
- Autonomic activity, emotional facial expressions and, 362–363
- Autonomic nervous system** A subsystem of the peripheral nervous system that carries messages between the central nervous system and the heart, lungs, and other organs and glands, 57
- mechanisms of related to emotion, 359–360
- Autonomous work groups (AWGs)** Self-managed employee groups that do not report to anyone for routine daily supervision, 654–655
- Availability heuristic** A mental shortcut through which judgments are based on information that is most easily brought to mind, 230–231
- Aversion conditioning** A method for reducing unwanted behaviors by using classical conditioning principles to create a negative response to some stimulus, 549
- Aversion therapy, 549
- Aversion to stimulus, 147–148
- Aversive racism, 591–592
- Avoidance-avoidance conflicts, 356
- Avoidance conditioning** The process of learning particular responses that avoid an aversive stimulus, 152–153, 161
- Avoidant personality disorder, 524
- Avoidant relationship, 396
- Awareness, mental processing without, 295–296
- Axons** Fibers that carry signals from the body of a neuron out to where communication occurs with other neurons, 53, 56
- Azarenka, Victoria, 618
- B**
- Babblings** Repetitions of syllables; the first sounds infants make that resemble speech, 247
- Babies. *See also* Infants
- individual temperament of, 393–394
 - stages of learning development, 247–248
- Back masked subliminal messages, 298
- Backward conditioning, 146
- Backward problem solving, 232
- Baillargeon, Renee, 403–404
- Balance, 113–114
- Balanced relationships, 593–594
- Baldwin, James Mark, 13
- Bandura, Albert, 167–168, 471–472
- Barbiturates, 317
- Bariatric surgery, 340
- Basic features, 126
- Basic memory processes, 179–180
- Basilar membrane** The floor of the fluid-filled duct that runs through the cochlea, 101
- B-cells, 446
- Beck, Aaron, 551–552
- Bedlam, 495
- Behavior
- attribution, 582–584
 - biology of, 51
 - characteristics of collectivist vs. individualist cultures, 21
 - effect of TV violence on, 169–171
 - factors that contribute to the leading causes of death in the U.S., 428
 - observation of, 31–32
 - shaping, 154
 - subliminal messages and, 296–297
- Behavioral approach system (BAS), 467
- Behavioral coping strategies, 452
- Behavioral genetics** The study of how genes and environment shape behavior, 41–43, 376–377
- sexual orientation and, 349
- Behavioral responses to stress, 434–435
- Behavioral signatures, 472
- Behavior-focused rating forms, use of in job performance appraisals, 635
- Behaviorism, 14
- Behavior modification** Treatments that use operant conditioning methods to change behavior, 545–546
- techniques, 546–549
- Behavior therapy** Treatments that use classical conditioning principles to change behavior, 545–546
- techniques, 546–549
- Believability, 229
- Bell-shaped curve of intelligence distribution, 262
- Belongingness, 355
- Benign paroxysmal positional vertigo (BPPV), 114
- Benzodiazepines, 566
- Berkeley, George, 12

- Berkowitz, Leonard, 610
 Between group variations, IQ tests, 270–271
Bias
 attribution errors, 583
 confirmation, 236
 experimenter, 38–39
 measuring, 242–243
 psychological diagnosis and, 501–503
 social perception and, 584
Biased sampling *The process of selecting a group of research participants from a population whose members did not have an equal chance of being chosen*, 40
Big Five model *A view based on studies using factor analysis that suggests the existence of five basic components of human personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism*, 465
 Biklen, Douglas, 44
 Bilingualism, 249–250
 Binet, Alfred, 259
Binge eating disorder *A pattern of sudden, recurrent episodes of eating huge amounts of food, but without purging*, 342–343
 Bini, Lucio, 563
 Binocular depth cues, 121
 Binocular disparity, 121
 Biochemical effects of alcohol, 316–317
 Biochemistry of hunger, 337–338
 Biochemistry of memory, 206
 Biofeedback training, 294
Biological approach *An approach to psychology in which behavior and behavior disorders are seen as the result of physical processes, especially relating to the brain and to hormones and other chemicals*, 16
 social psychology and, 620
 Biological basis of language acquisition, 249
 Biological clock, 517
 Biological factors
 aggression, 607–608
 anxiety disorders, 506
 autism spectrum disorder, 529
 depressive and bipolar disorders, 515–517
 gender roles, 405
 schizophrenia, 520–521
 sexual orientation and, 348–349
 Biological preparedness, 507–508
Biological psychologists *Psychologists who analyze the biological factors influencing behavior and mental processes; also called psychological psychologists*, 4
Biological psychology *The psychological specialty focused on the physical and chemical changes that cause, and occur in response to, behavior and mental processes*, 4, 51
 Biological trait theories, 466–469
 Eysenck's theory, 466–467
 Gray's reinforcement sensitivity theory, 467–469
 Biological treatments, 562–563
 electroconvulsive shock therapy, 563–564
 psychosurgery, 563
 Biopreparedness to stimuli, 147–148
Biopsychosocial approach *Viewing mental disorders as resulting from a combination of biological, psychological, and sociocultural factors*, 494–497
 Biopsychosocial factors, prosocial behavior, 615
 Biotechnology, use of to study mental processes, 14–15
 Bipolar cells, 95
Bipolar disorders *Conditions in which a person alternates between the two emotional extremes of depression and mania*, 514–515
 causes of, 515–518
 treatment of with psychoactive medications, 566
Bipolar I disorder, 515
Bipolar II disorder, 515
 Birth defects, prenatal exposures and, 378–379
Bisexuality *Sexual desire or behavior that is focused on members of both sexes*, 347
 Bislach, Edoardo, 682
 Blindness, conversion disorder and, 508–509
 Blindsight, 295
Blind spot *The point at which the optic nerve exits the eyeball*, 95
 Blood, signals for hunger from, 336–337
Blood-brain barrier *A characteristic of blood vessels in the brain that prevents some substances from entering brain tissue*, 313
Body dysmorphic disorder *An obsessive-compulsive disorder characterized by intense distress over imagined abnormalities of the skin, hair, face, or other areas of the body*, 505
 Body-kinesthetic intelligence, 280
 Body mass index (BMI), 339
 Body senses, 114–115
 pain, 110–113
 sensing body position, 113–114
 touch and temperature, 109–110
 Bonding, 392–393. *See also Attachment*
Bottom-up processing *Aspects of recognition that depend first on information about stimuli that come up to the brain from the sensory systems*, 126
 understanding speech, 246–247
 Bowlby, John, 394
 Bradshaw, Gary, 232–233
 Brain, 58–59
 areas involved in sleeping and dreaming, 305
 blood supply to, 671
 cerebral cortex, 62
 changes in during adolescence, 408
 changes in during infancy and childhood, 382
 developmental changes in, 76–77
 effects of sexual hormones on, 346
 fMRI studies of, 69–72
 forebrain, 60–62
 hindbrain, 59–60
 hunger and, 337–338
 imaging techniques, 67–72
 initiation of voluntary movement, 685
 injury, 672
 lateralization of, 73–74
 lesion analysis, 668–669
 localization of function in, 666–667
 major structures of, 59
 mechanisms of dysfunction, 673
 mechanisms of in emotions, 359–360
 memory storage areas in, 209–210
 midbrain, 60
 modules of, 667–668
 neurotransmitters in, 78–80
 organization of, 64–65
 repairing damage to, 74–75
 sensory and motor cortex, 62–64
 techniques for studying function and structure of, 68
Brain damage
 disruption of extrapyramidal and pyramidal motor systems, 359
 impact of, 207–209
Brainstem, 60
Brainstorming, 244
 Brain structures, memory and, 207–210
 Brain waves, electrical activity during sleep, 299–300
 Bregman, Elsie Oschrin, 628
 Brightness constancy, 123
Brightness *The overall intensity of the wavelengths making up light*, 96
 Broca, Paul, 65, 667
Broca's aphasia *A language disorder in which there is a loss of fluent speech*, 65, 683
 Broca's area, 65, 71
Brown-Peterson distractor technique *A method for determining how long unrehearsed information remains in short-term memory*, 188
Bulimia *An eating disorder that involves eating massive quantities of food, then eliminating it by self-induced vomiting or laxatives*, 341–342
 Bullying, 402
Burnout *A pattern of physical and psychological dysfunctions in response to continuous stressors*, 435
 cognitive appraisal and, 437
Bystander effect *A phenomenon in which the chances that someone will help in an emergency decrease as the number of people present increases*, 613

C

- Caffeine, 319
 Calkins, Mary Whiton, 20
 Cannon-Bard theory, 363–364
 Cannon's central theory of emotion, 363–364
 Canon, Walter, 363–364
 Capgras syndrome, 680
 Capsaicin, 105
 Carbon monoxide, 79
 Cardiovascular system, stress and, 446–447
 Careers, early adulthood, 417–418
 Caregivers
 attachment formation and, 392–396
 social and emotional development in infants and, 398–399
 Carpal tunnel syndrome, 652
Case studies *A research method involving the intensive examination of some phenomenon in a particular individual, group, or situation*, 32, 39
 Caspi, Avshalom, 479–480
 Catastrophic events
 coping with, 429–430
 psychological reactions to stress of, 434–435
 Catastrophizing, 434, 551
 Catecholamines, release of in reaction to stress, 432–433
 Category labels, 365
 Cattell, James McKeen, 628
 Cattell, Raymond B., 276, 464
 Causation
 correlation and, 35
 TV violence and violent behavior in children, 169–171
 Cause and effect relationships, experimental exploration of, 35–39
 Cells of the nervous system, 51–55. *See also Nervous system*
Central nervous system (CNS) *The parts of the nervous system encased in bone; specifically, the brain and the spinal cord*, 56
 plasticity in, 74–76
 sensory systems and, 88
 Central route to attitude change, 586
 Central theory of emotion, 363–364
 Central traits, 464
Cerebellum *The part of the hindbrain whose main functions include controlling finely coordinated movements and storing memories about movement but which may also be involved in impulse control, emotion, and language*, 60, 305
Cerebral cortex *The outer surface of the brain*, 62–66
 association cortex, 64–66
 depression of activity in with opiates, 320

- developmental changes in, 77
 functional areas of, 63
 sensory and motor cortex, 62–63
 Cerebral hemispheres, 62
- Cerebral infarct** A loss of blood supply to some part of the brain, resulting in brain damage that disrupts some aspect of behavior or mental processes, 667, 670–671
 anosognosia following, 678–679
 aphasia due to, 683
- Cerebrospinal fluid** A clear liquid that surrounds and buffers the brain against vibration, 672
- Cerebrovascular accident (CVA), 670–671. See also Cerebral infarct
- Cerletti, Ugo, 563
- C-fibers, 110
- Change blindness, 133
- Characteristic features, 223
- Charismatic leaders, 619–620, 658–659
- Chemical senses
 sense of smell, 105–107
 sense of taste, 107–108
 smell, taste, and flavor, 104–105
- Chemicals regulating hunger, 337–338
- Child abuse, antisocial personality disorder and, 526–527
- Child care, effect of on emotional development of infants, 397–398
- Childhood aggression, correlational studies of, 34–35
- Childhood obesity, 340
- Children
 achievement motivation in, 351–352
 autism spectrum disorders, 529–530
 cognitive development of, 384–386
 development of social skills, 402
 egocentricity of, 385
 externalizing disorders, 528–529
 information processing of, 387–388
 internalizing disorders of, 529
 milestones of development of, 388
 peer friendships and popularity, 401–402
 psychological disorders of, 527–528
- Chimpanzees, use of language by, 250–252
- Chromosomes** Structures in every biological cell that contain genetic information in the form of genes, 378
- Chronic stressors, 430
- Chronic traumatic encephalopathy (CTE), 672
- Chronological age vs. mental age, 259–260
- Chronotypes, 304
- Chunking** Organizing individual stimuli so that they will be perceived as larger units of meaningful information, 187, 236
- Circadian rhythm (human biological rhythm)** A cycle, such as waking and sleeping, that repeats about once a day, 303–305
 work schedules and, 653
- Circle of thought, 219–220
- Civil Rights Act, 638
- Clarity, 320
- Clarity of the need for help, 612
- Classical conditioning** A procedure in which a neutral stimulus is paired with a stimulus that triggers an automatic response until the neutral stimulus alone comes to trigger a similar response, 142, 144. See also Behavior therapy
 applications of, 148–149
 attention to stimuli, 147
 basic processes of, 149
 biopreparedness to stimuli, 147–148
 conditioned responses over time, 145
 drug addiction, 150
 Pavlov's experiments, 143–144
 phobias, 149–150, 507–508
 predictability of stimuli, 147
- stimulus generalization and discrimination, 145–146
 timing of signals, 146–147
- Classical psychoanalysis, 541–542. See also Psychoanalysis
- Classrooms, self-fulfilling prophecy in, 582
- Client-centered therapy (person-centered therapy)** A type of therapy in which the client decides what to talk about, and when, without direction, judgment, or interpretation from the therapist, 543–544
- Climate of safety, 654
- Clinical neuropsychologists** Neuropsychologists who use tests and other methods to try to understand neuropsychological problems and intact functions in individual patients, 666
- Clinical psychologists** Psychologists who seek to assess, understand, and change abnormal behavior, 6
- Clinical psychology, 6
- Clinical significance, 556–557
- Clinical social workers, 540
- Closure, 118
- Clothing and culture, 597
- Club drugs
 flunitrazepam, 318
 GHB, 317–318
 MDMA, 320
- CNS depressant drugs** Psychoactive drugs that inhibit the functioning of the central nervous system, 316–317
 alcohol, 316–317
 barbiturates, 317
 flunitrazepam, 318
 GHB, 317–318
- CNS stimulating drugs** Psychoactive drugs that increase behavioral and mental activity, 318
 amphetamines, 318
 caffeine, 319
 cocaine, 318–319
 MDMA, 320
 nicotine, 319
- Coady, Bernadine, 312
- Cocaine, 314, 318–319
 addiction to, 532
 prenatal exposure to, 379
- Cochlea** A fluid-filled spiral structure in the inner ear in which auditory transduction occurs, 100–101
- Codeine, 320
- Cognitive ability, 259
 tracking over the life span, 281–284
- Cognitive/affective theory, 472–473
- Cognitive appraisal theory of emotion, 365
 reaction to stressors and, 437
- Cognitive approach** A way of looking at human behavior that emphasizes research on how the brain takes in information, creates perceptions, forms and retrieves memories, processes information, and generates integrated patterns of action, 18
- Cognitive-behavioral approach, 18
- Cognitive behavior therapy** Learning-based treatment method that helps clients change the way they think as well as the way they behave, 545–546
 techniques, 550–552
- Cognitive bias, psychological diagnosis and, 501–503
- Cognitive changes due to stress, 434
- Cognitive changes in adulthood, 414–416
- Cognitive closure, 589
- Cognitive coping strategies, 451–452
- Cognitive development
 individual variations in, 390–392
 infancy and childhood, 382–384
 milestones of in infancy and childhood, 388
 new views of, 386–387
 Piaget's periods of, 383
 Vygotsky's theories of, 389–390
- Cognitive dissonance theory** A theory that attitude change is driven by efforts to reduce tension caused by inconsistencies between attitudes and behaviors, 586–587
- Cognitive distortions, 551
- Cognitive factors, motivation and, 329
- Cognitive map** A mental model that represents familiar parts of the environment, 166, 227
- Cognitive person variables, 472
- Cognitive processes, 163
- Cognitive psychologists** Psychologists who study the mental processes underlying judgment, decision making, problem solving, imagining, and other aspects of human thought or cognition; also called experimental psychologists, 4
- Cognitive psychology, 4
- Cognitive reserve, bilingualism and, 250
- Cognitive restructuring, 551
- Cognitive theories of emotion, 364–366
- Cognitive theories of prejudice, 589–590
- Cognitive therapy** An organized problem-solving approach in which the therapist actively collaborates with clients to help them notice how certain negative thoughts precede anxiety and depression, 551–552
- Cognitive unconscious, 294
- Cohort effect, 282
- Cold fibers, 109–110
- Collectivist vs. individualist cultures, 21
- Color blindness, 98
- Color circle, 96
- Color saturation** The purity of a color, 96
- Color sensations, wavelengths and, 96–97
- Color spectrum, 96
- Color vision, theories of, 97–98
- Coma, 676
- Combined approach to treatment of psychological disorders, 568–570
- Commitment, 595
- Common fate, 118
- Common region, 119
- Communicating emotion, 366
- Community mental health movement, 571
- Community psychologists** Psychologists who work to obtain psychological services for people in need of help and to prevent psychological disorders by working for changes in social systems, 6
- Community psychology** An approach to minimizing or preventing psychological disorders by promoting social change and community mental health programs, 6, 570–571
- Comparative cognition, 163
- Compassionate love, 595–596
- Competencies, 472
- Competition** Any type of behavior in which individuals try to attain a goal while denying other access to that goal, 616
- Complementarity, 385
- Complexity, 221
- Compliance** Adjusting one's behavior because of a direct request, 598–599
 creating, 601–602
- Compulsions** Repetitive behaviors that interfere with daily functioning but are performed in an effort to prevent dangers or events associated with obsessions, 505
- Computational theory of the mind, 19
- Computer problem solving
 artificial intelligence, 237
 neural network models, 238–239
 symbolic reasoning and computer logic, 238

- Concepts** Categories of objects, events, or ideas that have common properties, 223
- Conceptual act model of emotion, 365
- Concrete operations** According to Piaget, the third period of cognitive development, during which children can learn to count, measure, add, and subtract, 385
- Conditioned reinforcers, 154
- Conditioned response (CR)** The response triggered by the conditioned stimulus, 144
- extinction and spontaneous recovery of over time, 145
- Conditioned stimulus (CS)** An originally neutral stimulus that now triggers a conditioned response, 144
- Conditioning, language acquisition and, 248–249
- Conditions of worth** According to Rogers, circumstances in which an individual experiences positive regard from others only when displaying certain behaviors or attitudes, 475
- Conduct disorders, 528
- Conduction deafness, 101
- Cones** Photoreceptors in the retina that are less light sensitive than rods but that can distinguish colors, 94–95
- individual differences in types of, 96–97
- Confabulation** A characteristic of some neuropsychological disorders in which patients report false memories, 675
- Confidentiality, 561–562
- Confirmation bias** The tendency to pay more attention to evidence in support of one's hypothesis about a problem than to evidence that refutes that problem, 236
- Conflicting motives and stress, 356–357
- Conformity** Changing one's behavior or beliefs to match those of others, generally as a result of real or imagined (though unspoken) group pressure, 598–601
- Confound** In an experiment, any factor that affects the dependent variable, along with or instead of the independent variable, 36–37
- Confounds
- participant expectations, 37–38
 - random variables, 37
- Congruence, 474
- Congruence** In client-centered therapy, a consistency between the way therapists feel and the way they act toward clients, 544
- Connectedness, 119
- Connectionist models, 162
- Conscientiousness, 443, 465, 630
- Conscious level** The level of consciousness at which mental activities accessible to awareness occur, 294–295
- Consciousness disturbances** Neuropsychological disorders in which there are impairments in the ability to be aware of the world, 676–679
- Consciousness** The awareness of external stimuli and our own mental activity, 12, 293
- functions of, 13–14
 - levels of, 294–295
 - states of, 293–294
- Conscious state** The characteristics of consciousness at any particular moment, 293–294
- Consequences Test, 239
- Conservation** The ability to recognize that the important properties of substances or objects, such as quantity, volume, or weight, remain constant despite changes in shape, length, or position, 385
- Consolidating memory, 166, 209
- Constancy of perception, 122
- brightness constancy, 123
 - shape constancy, 123
 - size constancy, 123
- Constructive memory, 194–196
- neural network models and, 196–197
- Consummate love, 596
- Context, 126
- Context-specific memory (context-specific learning)**
- Memories that are helped or hindered by similarities or differences between the contexts in which they are learned and recalled, 191
- Contingencies, 547–548
- Continuity, 118
- Continuous reinforcement, 155
- Control, learned helplessness and expectations of, 164
- Control group** In an experiment, the group that receives no treatment or provides some other baseline against which to compare the performance or response of the experimental group, 36
- Control of attention, measuring changes in across the life span, 283
- Control question test, 363
- Convenience samples, 40
- Conventional level** Moral reasoning that reflects a concern about other people as well as the belief that morality consists of following rules and conventions, 412
- Convergence, 121
- Convergent thinking** The ability to apply the rules of logic and what one knows about the world to narrow down the possible solutions to a problem, 240
- Conversion disorder** A somatic symptom disorder in which a person appears to be (but actually is not) blind, deaf, paralyzed, or insensitive to pain, 66, 508–509, 541
- Cooperation** Any type of behavior in which people work together to attain a goal, 616
- promoting, 617–618
- Coping
- methods for, 452
 - resources and methods, 438–439
 - steps for dealing with stress, 451
 - strategies for, 451–452
 - ways of, 438–439
- Core affect, 365
- Cornea** The curved, transparent, protective layer through which light rays enter the eye, 93
- Coronary heart disease, hostility as a risk factor for, 447–448
- Corpus callosum** A massive bundle of axons that connects the right and left cerebral hemispheres and allows them to communicate with each other, 62
- lateralization, 73
- Correlational studies** Research methods that examine relationships between variables in order to analyze trends in data, test predictions, evaluate theories, and suggest new hypotheses, 33–34, 39
- Correlation coefficient, 34
- calculation for intelligence tests, 263–264
- Correlation** In research, the degree to which one variable is related to another, 33–34
- causation and, 35
- Correlations of intelligence, 267–268. See also Intelligence
- Corticosteroids, secretion of in response to stress, 433
- Cortisol, 82
- secretion of in response to stress, 433
- Counseling psychologists** Psychologists who seek to assess, understand, and change abnormal behavior, 6
- Counseling psychology, 6
- Counterproductive work behaviors (CWBs), 633
- aggression and, 650–651
- Couples therapy** A form of therapy that focuses on improving communication between partners, 552–553
- Covert orienting, 132
- Crack, 318
- Cramming, 211
- Cravings, substance abuse and, 315
- Creative intelligence, 277–279
- Creative skills, 240
- Creative thinking, 239–240
- Creativity** The capacity to produce original solutions or novel compositions, 239–240
- cognitive and personality characteristics for, 239–240
- Credentials, job competence and, 631
- Critical incidents, 635
- Critical period** An interval during which certain kinds of growth must occur if development is to proceed normally, 379
- Critical period for language acquisition, 249
- Critical thinking** The process of assessing claims and making judgments on the basis of well-supported evidence, 27–28
- questions to ask, 28–29
 - scientific research and, 29–30
 - statistics and research methods as tools in, 44–45
- Cross-cultural psychology, 23
- Cross-sectional studies, 282
- Crystallized intelligence** The specific knowledge gained as a result of applying fluid intelligence, 276
- measuring changes in across the life span, 283
- Cultural background
- influence of on behavior, 20–23
 - influence of on IQ scores, 270–271
- Cultural competence, 561
- Cultural diversity training, 561
- Cultural factors
- achievement motivation and, 352
 - cognitive development and, 389–390
 - eating and, 338–339
 - ethnic identity, 410–411
 - expression of emotion and, 367–369
 - job satisfaction and, 647
 - mate selection and, 331
 - parenting styles and, 400–401
 - sexuality and, 346–347
 - temperamental qualities and, 393–394
 - therapy and, 560–561
- Cultural-general disorders, 496
- Cultural values
- advertising and, 22
 - altered states of consciousness and, 299
- Culture-specific forms of psychological disorders, 496
- Culture** The accumulation of values, rules of behavior forms of expression, religious beliefs, occupational choices, and the like for a group of people who share a common language and environment
- clothing and, 597
 - perception and, 129
 - personality and, 477–478
 - forms of expression, religious beliefs, occupational choices, and the like for a group of people who share a common language and environment, 21
- Cutaneous senses** Senses including touch, temperature, pain, and kinesthetic perception that are spread throughout the body; also called somatosensory systems, 109
- Cyberchondria, 503
- Cyclothymic disorder** A bipolar disorder characterized by an alternating pattern of mood swings that is less extreme than that of bipolar I or bipolar II, 515
- D**
- Daily hassles, 430
- Dark adaptation** The increasing ability to see in the dark as time passes, 94
- Darwin, Charles, influence of on William James' functionalism, 13

- Data** Numbers that represent research findings and provide the basis for conclusions, 43
- Date-rape drugs, 318
- Day care, effect of on emotional development of infants, 397–398
- Deafness, 101–102
conversion disorder and, 508
- Death, 419
factors contributing to the leading causes of, 428
- Death instincts, 458
- Decay theory** A description of forgetting as the gradual disappearance of information from memory, 200–201
- Decibels, 99
- Decision making, 240
biases and flaws in, 241–242
complexity and, 221
evaluating options, 241
factors influencing, 243
group processes in, 243–244
motivational conflicts and, 356
- Decision under uncertainty, 240–242
- Decomposition, 231
- Deductive reasoning, 228
- Deep brain stimulation (DBS), 563
- Deep structure** An abstract representation of the underlying meaning of a given sentence, 246
- Defense mechanisms** Unconscious tactics that either prevent threatening material from surfacing or disguise it when it does, 458
- Defensive aggression, 607–608
- Deficiency orientation, 354, 475
- Deinstitutionalization, 571
- Dekker, Laura, 232
- Delicacies, 338
- Delirium** Periods of abnormally impaired or abnormally elevated levels of consciousness, 677
- Delusional disorder, 520
- Delusions** False beliefs, such as those experienced by people suffering from schizophrenia or severe depression, 512
- Delusions of grandeur, 519
- Delusions of persecution, 519
- Dementia** Neuropsychological disorders in which there are significant and disruptive impairments in memory, as well as in perceptual ability language, or learned motor skills
- Alzheimer's disease, 686–687
- pugilistica, 672
- treating, 688
- vascular, 687
- language, or learned motor skills, 416, 686
- Dendrites** Neuron fibers that receive signals from the axons of other neurons and carry those signals to the cell body, 53, 56
- Denial hypothesis for anosognosia, 678
- Denton, Gordon, 116
- Deoxyribonucleic acid. See DNA
- Dependence, 530
substance abuse and, 315
- Dependent variable** In an experiment, the factor measured to see whether or not it has been affected by the independent variable, 36
- Depression
changes in neurotransmitters and, 78
during pregnancy, 379
suicide and, 513–514
treatment of with electroconvulsive therapy, 563–564
treatment of with TMS, 68
- Depressive disorders** Conditions in which a person experiences extremes of moods for long periods, shifts from one extreme mood to another, and experiences moods that are inconsistent with events, 512–514
causes of, 515–518
- Deprivation, cognitive development and, 390–391
- Depth cues, 121
culture and, 129
- Depth perception** Perception of distance, allowing us to experience the world in three dimensions, 120–121
- Desaturated color, 96
- Descriptive norms, 597
- Descriptive statistics** Numbers that summarize a set of research data, 43
- Desegregation, effect of on prejudice, 590
- Desensitization hierarchy, 546
- Designing survey research, 33
- Developed ability, intelligence as, 267
- Developing minds, exploration of, 403–404
- Development
building blocks of, 382–383
identity and self, 410–411
memory and, 389
moral, 411–413
new views of, 387
philosophical views on, 375–376
social skills, 402
- Developmental psychologists** Psychologists who seek to understand, describe, and explore how behavior and mental processes change over a lifetime, 5
- Developmental psychology** The psychological specialty that documents the course of people's social, emotional, moral, and intellectual development over the life span, 5, 375
- Deviance, 492
- Diagnosing psychological disorders, 500–501
bias in, 501–503
- Diagnostic and Statistical Manual of Mental Disorders.** See DSM-5
- Diathesis-stress model** The notion that psychological disorders arise when a predisposition for a disorder combines with sufficient amounts of stress to trigger symptoms, 436–437, 497
- Difference threshold** The smallest detectable difference in stimulus energy, 91–92
- Diffusion of responsibility, bystander effect and, 613
- Diffusion tensor imaging (DTI), 68
- Digestive system, signals for hunger from, 336
- Directed lie test, 363
- Directing attention, 132–133
- Disconnection syndrome, 668
- Discrimination of stimulus, 145–146, 153–154
- Discriminative conditioned stimuli** Stimuli that signal whether reinforcement is available if certain response is made, 153, 161
- Diseases of adaptation** Illnesses caused or worsened by stressors, 433
- Dishabituation, 142
- Disordered behavior, treating using humanistic techniques, 543
- Disorders of movement control, 684–685
- Disorganized relationship, 396
- Dispositional optimism, 442
- Dissociation theory, 311
- Dissociative amnesia** A psychological disorder marked by sudden loss of memory for one's own name, occupation, or other identifying information, 510
- Dissociative disorders** Conditions involving sudden and usually temporary disruptions in a person's memory, consciousness, or identity, 509–511
- Dissociative identity disorder (DID)** A dissociative disorder in which a person appears to have more than one identity, each of which behaves in a different way, 510–511
- Dissonance, 587
- Distance, depth perception, 120–121
- Distracting style, 518
- Distress, 492
- Distributed practice** Learning new information in many study sessions that are spaced across time, 174, 211
- Distributed training, 640–641
- Divergent thinking** The ability to generate many different solutions to a problem, 239
- Diversity training, 561
- Dividing attention, 133–134
- DNA** The molecular structure of a gene that provides genetic code, 378
analysis of in behavioral genetic research, 43
- Dodo Bird Verdict, 555–556
- Door-in-the-face technique, 601–602
- Dopamine, 78
action of opiates on reward system of, 320
increasing release of with CNS stimulating drugs, 318
role of in schizophrenia, 521
- Double-blind design** A research design in which neither the experimenter nor the participants know who is in the experimental group and who is in the control group, 38
- Downers, 317
- Down syndrome, 286
- Downward social comparison, 578
- Dramatic-erratic cluster of personality disorders, 524
- Dreaming** The production during sleep of storylike sequences of images, sensations, and perceptions that last from several seconds to many minutes; it occurs mainly during REM sleep, 308–309
- Dreams
activation-synthesis theory of, 308–309
content of, 541–542
wish fulfillment theory of, 308
- Drive** A psychological state that arises from an imbalance in homeostasis and prompts action to fulfill a need, 332
- Drive reduction theory** A theory that motivation arises from imbalances in homeostasis, 331–332
- Driving while fatigued, 306
- Drug abuse (substance use disorder)** The use of psychoactive drugs in ways that deviate from cultural norms and cause serious problems for the user, 314–315
- Drug addiction, 150–151
- Drug dependence, 532
- Drug effects, expectations and, 315–316
- Drug-facilitated sexual assault, 318
- Drugs, prenatal exposure to, 379
- Drug tolerance** A condition in which increasingly larger drug doses are needed to produce a given effect, 315
- Drug withdrawal** A set of symptoms associated with ending the use of an addictive substance, 315
- DSM-5, 498–500
classification of dementia in, 686
evaluation of, 500–501
personality disorders, 524
- Dying, 419
- Dysfunction, 492–493
- E**
- Eagly, Alice, 619–620
- Eardrum** A tightly stretched membrane in the middle ear that generates vibrations that match the sound waves striking it, 100–101
- Early adolescence, changes of, 408
- Early adulthood, 413

- cognitive changes in, 414
social changes during, 416–418
- Early-enrichment programs**, 271–272
- Ear structures**, 100–101
- Eating**. *See Hunger*
- Eating disorders**
adolescents and, 408
anorexia nervosa, 341
binge eating, 342
bulimia, 341–342
- Ebbinghaus, Hermann**, 12, 200
- Ebbinghaus illusion**, 124
- Eclectic therapists**, 541
- Ecstasy**, 320
- Education**
extrinsic motivation in, 334
self-fulfilling prophecy in the classroom, 582
- Educational psychologists** *Psychologists who study methods by which instructors teach and students learn and who apply their results to improving those methods*, 6
- Educational psychology**, 6–7
- Effective leadership**, 656
- Ego** *According to Freud, the part of the personality that makes compromises and mediates conflicts between and among the demands of the id, the superego, and the real world*, 458
- Egocentricity of children, 385
- Ego defense mechanisms, 459
- Ego psychologists, 461
- E-health, 562
- Eidetic imagery, 189
- Elaboration likelihood model** *A model of attitude change suggesting that people can change their attitudes through a central route (by considering an argument's content) or through a peripheral route (by relying on irrelevant persuasion cues)*, 585–586
- Elaborative rehearsal** *A memorization method that relates new information to information already stored in memory*, 181, 211
- Electra complex** *The notion that young girls develop an attachment to the father and compete with the mother for the father's attention*, 460
- Electrical synapses, 54
- Electroconvulsive shock therapy (ECT)** *A brief electric shock administered to the brain, usually to reduce severe depression that does not respond to medication treatments*, 563–564
- Electroencephalographs (EEGs), 67
brain activity during sleep, 299–300
- Electromagnetic radiation, 92
spectrum of, 93
- Elements of language, 245–246
- Elements of sensory system, 89
- Ellis, Albert, 550
- Elwood, Gordon, 225
- Embryonic stage of development, 378
- Embryo** *The developing individual from two weeks to two months after fertilization*, 378
- EMDR, 27
experimental investigation of, 35–36
thinking critically about, 28–29
- Emerging adulthood, 416–418. *See also Early adulthood*
- Emotion**
cognitive theories of, 364–366
communicating, 366
expression of in people with schizophrenia, 520
innate expressions of, 366–367
measurement of intelligence and, 266–267
regulation of in the forebrain, 61
- social and cultural influences on expression of, 367–369
theories of, 360–364
- Emotional aspects of pain**, 110
- Emotional coping strategy**, 452
- Emotional development**
attachment and, 392–393
effect of day care on, 397–398
infancy and childhood, 406
- Emotional disclosure**, 439
- Emotional factors, motivation and**, 329
- Emotional intelligence**, 280
- Emotional stress reactions**, 433
- Emotion culture**, 369
- Emotion-focused coping techniques**, 438–439
- Emotions** *Temporary positive or negative experiences that are felt as happening to the self, that are generated partly by interpretation of situations, and that are accompanied by learned and innate physical responses*, 358–359. *See also Emotion*
- biology of, 359–361
motivational conflict, 357
nature of, 357–359
theories of, 366
- Empathy**
creating, 614
development of in children, 402
mirror neuron mechanisms and, 71
obedience and, 604
- Empathy-altruism helping theory** *A theory suggesting that people help others because they feel empathy toward them*, 614
- Empathy** *In client-centered therapy, the therapist's attempt to appreciate how the world looks from the client's point of view*, 543–544
- Empirically supported therapies (ESTs)** *Treatments for psychological disorders whose effectiveness has been validated by controlled experimental research*, 557–558
- Empiricism, 11–12
- Employee characteristics, measuring, 630
- Employee motivation, 642
ERG theory of, 643
expectancy theory of, 643
goal-setting theory of, 644
- Employee recruitment process, 636–637
- Employee selection, 637–638
personality tests and, 484–485
- Employee training, 638
assessing needs, 639
designing programs for, 639–641
evaluating programs, 641–642
- Encoding memory** *The process of putting information into a form that the memory system can accept and use*, 179
- Encodings, 472
- Encoding specificity principle** *A principle stating that the ability of a cue to aid retrieval depends on how well it taps into information that was originally encoded*, 191
- Encoding** *Translation of the physical properties of a stimulus into a specific pattern of neural activity*, 89
long-term memory, 188–189
short-term memory, 186
sounds, 102–103
touch, 109
- Endocannabinoids, 338
- Endocrine system** *Cells that form organs called glands and that communicate with one another by secreting chemicals called hormones*, 80–82
- Endorphins, 79, 111
stimulation of by opiates, 320
- Engineering psychology** *A field of study in which psychologists study human factors in the use of equipment and help designers create better versions of that equipment*, 4–5, 652
- Enterostatin, 338
- Environment**
conditions that can raise IQ scores, 271–272
genes and, 377
influence of on aggression, 611
role of in intelligence, 267–268
- Environmental factors**
achievement motivation and, 351–352
anxiety disorders, 506–507
children's cognitive development and, 390–391
happiness and, 354
motivation and, 329
prosocial behavior and, 615–616
- Environmental psychologists** *Psychologists who study the effects of the physical environment on behavior and mental processes*, 8
- Environmental psychology** *The study of the effects of the physical environment on people's behavior and mental processes*, 611
- Epigenetics** *The study of potentially inheritable changes in gene expression that do not alter a cell's DNA*, 43
- Epilepsy, 115–116
brain damage due to, 674–675
malfunction of GABA systems and, 79
treatment of with psychosurgery, 563
- Episodic memory** *Memory for events in one's own past*, 180, 415
- Equal opportunity, 639
- Equilibrium, 331
- ERG theory** *A theory of motivation that focuses on employees' needs at the levels of existence, relatedness, and growth*, 355, 643
- Erikson, Erik, 398–399, 461
identity crisis theory of, 411
- Escalation effect, 160
- Escape conditioning** *The process of learning responses that stop an aversive stimulus*, 152–153, 161
- Essence, 320
- Esteem, 355
- Esteem building, 478
- Estradiol, 346
- Estrogens** *Feminine hormones that circulate in the blood stream*, 81, 346
- Ethical guidelines for psychologists, 45–46, 561–562
- Ethical Principles of Psychologists and Code of Conduct*, 46
- Ethics, Milgram's obedience experiments and, 605
- Ethnic identity** *The part of a person's identity that reflects the racial, religious, or cultural group to which that person belongs*, 410–411
- Ethnicity, job satisfaction and, 647
- Ethnic minorities
differences in IQ scores of, 269–270
intelligence testing and, 266
possible bias in diagnosis of mental disorders in, 501–503
suicide rates among, 514
- Ethnic prejudice. *See also Prejudice*
elimination of, 591–592
fighting, 591
- Evidence-based practice** *The selection of treatment methods based mainly on empirical evidence of their effectiveness*, 556
examples of, 559
- Evolution, 16
- Evolutionary approach** *An approach to psychologist that emphasizes the inherited, adaptive aspects of behavior and mental processes*, 16–17
prosocial behavior, 614–615

- Evolutionary view of mate selection, 331
 Excitation transfer, 610–611
Excitation transfer theory *The theory that physiological arousal stemming from one situation is carried over to and enhances emotional experience in an independent situation*, 365
 Excitement phase of sexual response cycle, 343
 Existence, relatedness, growth (ERG) theory. *See ERG theory*
 Existence needs, 355, 643
 Existential therapy, 545
 Exorcisms, 494
 Expectancies
 Mischel's definition of, 472
 Rotter's definition of, 471
 Expectancy, 127, 221
Expectancy theory *A theory of workplace motivation in which employees are seen as acting in accordance with expected results and with how much they value those results*, 471, 643
 Expectations, 91
 drug effects and, 315–316
 learned helplessness and, 164
Expected value *The total benefit to be expected of a decision if it were repeated on several occasions*, 241–242
 Experience, perception and, 129
Experimental group *In an experiment, the group that receives the experimental treatment*, 36
 Experimental neuropsychologists, 666
 Experimental psychologists, 4
Experiment *A study in which the researcher directly controls one variable and then observes the effect of that manipulation on another variable, while holding all other variables constant*, 39
 confounds, 36–38
 exploring cause and effect, 35–39
 variables in, 36
Experimenter bias *A confound that occurs when an experimenter unintentionally encourages participants to respond in a way that supports the experimenter's hypothesis*, 38
 Expertise, 239
 Explicit memories, 389
Explicit memory *Information retrieved through a conscious effort to remember something*, 181
 Explicit prejudice, 592
 Exposure techniques, 549
 Expressive aposodia, 684
 Expressive displays, 358
 External attribution, 582–584
 Externalizing disorders, 528–529
 External rewards, 334–335
 Externals, 471
Extinction *The gradual disappearance of a conditioned response*, 145, 548
 schedules and, 157
 Extrapyramidal motor system, role of in emotions, 359
 Extraversion, 461, 465
Extrinsic motivation *Engaging in behavior in order to obtain an external reward or avoid a penalty or other undesirable consequences*, 333–335
 Eye, major structures of, 93
Eye convergence *A depth cue that results when the eyes rotate to project the image of an object on each retina*, 121
 Eye movement desensitization and reprocessing. *See EMDR*
 Eyewitness memory, impact of questions on, 198
 Eyewitness testimony, memory, perception, and, 197–199
 Eysenck, Hans, 464, 466–467, 554
- F**
- Facial expressions, communication of emotion through, 368–369
 Facial feedback hypothesis, 362–363
 Facilitated communication, 44
 Factor analysis, 464
 Factors influencing intelligence, 267–268. *See also Intelligence*
 Fairness of IQ tests, 265–266
 False beliefs, 519. *See also Delusions*
 False memories, 195–196, 202–205
 Family-friendly work policies, 647
 Family studies, 41–42
 Family system, 553
Family therapy *A type of treatment involving two or more clients from the same family*, 552–553
 Farsightedness, 94
 Fast-growing occupations, 637
 Fatty acids, 336
 Faulty communication, interpersonal conflict and, 618
Feature detectors *Cells in the cerebral cortex that respond to a specific feature of an object*, 96, 126
 Fechner, Gustav, 12
 Feedback, employee training and, 640
 Feedback system, 58
 Feeding Infants and Toddlers Study, 340
 Feeling-of-knowing experience, 194
 Female sex hormones, 81
Fetal alcohol syndrome *A pattern of defects found in babies born to women who abused alcohol during pregnancy*, 379
Fetus *The developing individual from the third month after conception until birth*, 378
 Fiber tracts, 57
Fight-flight reaction *A physical reaction triggered by the sympathetic nervous system that prepares the body to fight or to run from a threatening situation*, 82, 361, 431
Figure ground discrimination *The ability to organize a visual scene so that it contains meaningful figures set against a less relevant ground*, 117–118
Figure *The part of the visual field that has meaning*, 117
 First impressions, 581
 forming, 581–582
 self-fulfilling prophecies, 582
 Fissures, 62
Five-factor personality model *A view based on studies using factor analysis that suggests the existence of five basic components of human personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism*, 465
 Fixations, 458
 anal, 460
 oral, 459
 phallic, 460
 Fixed-action patterns, 330
 Fixed-interval (FI) reinforcement schedules, 155–156
 Fixed-ratio (FR) reinforcement schedules, 155–156
 Flashbulb memories, 204
 Flat affect, 520
 Flavor, 104–105, 338
 Flexibility, measuring changes in across the life span, 283
 Flextime, 647
 Flight or freeze system (FFS), 467
Flooding *An exposure technique for reducing anxiety that keeps a client in a feared but harmless situation*, 548–549
Fluid intelligence *The basic power of reasoning and problem solving*, 276
 measuring changes in across the life span, 283
- Fluid reasoning, measurement of on Stanford-Binet test, 261
 Flunitrazepam, 318
 fMRI, 67–68
 behavior and mental process information from, 69–72
 studies of hypnotized individuals, 311
 use of in pain management, 111
 use of to measure information processing, 222
 Folkman, Susan, 439
 Food culture, 338–339
 Food selection, sociocultural experience and, 338–339
 Foot-in-the-door technique, 601
Forebrain *The most highly developed part of the brain; it is responsible for the most complex aspects of behavior and mental life*, 60
 major structures of, 61
Forensic psychologists *Psychologists who assist in jury selection, evaluate defendants' mental competence to stand trial, and deal with other issues involving psychology and the law*, 8
 Forgetting, 188. *See also Short-term memory*
 Ebbinghaus's curve of, 200
 interference and, 201
 measuring, 200
 repressed memories of traumatic events, 202–205
 Formal concepts, 223
Formal operational period *According to Piaget, the fourth period of cognitive development, characterized by the ability to engage in hypothetical thinking*, 385
Formal reasoning *A set of rigorous procedures for reaching valid conclusions*, 228
 Forward conditioning, 146
Fovea *A region in the center of the retina*, 95
 Fragile X syndrome, 286
 Frankl, Viktor, 545
 Free association, 541
 Free-floating anxiety, 505
 Freeman, Jelani, 375
 Frequency matching, 103
Frequency *The number of complete waves, or cycles, that pass a given point per unit of time*, 92–93, 100
 Freud, Anna, 457
 Freud, Sigmund, 13, 294, 308, 457, 541–542
 biases of, 462–463
 Freudian slips, 541–542
 Friedman, Howard, 443–444
 Fromm, Erich, 461
 Frontal lobe, 62
 Frontotemporal degeneration (FTD), 683
Frustration-aggression hypothesis *A proposition stating that frustration always leads to some form of aggressive behavior*, 610
 Functional analysis of behavior, 14
Functional fixedness *The tendency to think about familiar objects in familiar ways*, 235, 434
 Functionalism, 13–14
 Functional magnetic resonance imaging. *See fMRI*
Fundamental attribution error *A bias toward attributing the behavior of others to internal factors*, 583
- G**
- GABA, 78–79, 570
 increasing effects of using CNS depressant drugs, 316
 g *A general intelligence factor that Charles Spearman postulated as accounting for positive correlations between people's scores on all sorts of cognitive ability tests*, 276
 Gains, decision making biases and, 241
 Galanin, 338

- Gall, Franz, 667
 Gambler's fallacy, 242
 Gambling, decision making biases and, 241–242
 Gamma-amino butyric acid. *See GABA*
 Gamma hydroxybutyrate. *See GHB*
 Ganglion cells, 95–96
 Gap junctions, 54
 Gardner, Beatrice and Allan, 251
 Gardner, Howard, 279–280
 Gases, 79
Gate control theory of pain *A theory suggesting the presence of a "gate" in the spinal cord that either permits or blocks the passage of pain impulses to the brain*, 110–111
 Gatiss, John, 233–234
 Gender
 job satisfaction and, 647
 leadership potential and, 619–620
 role of in response to stressors, 442–443
Gender roles *Patterns of work, appearance, and behavior that a society associates with being male or female*, 160, 346–347, 404–406
 Gender stereotypes, intelligence testing and, 266
General adaptation syndrome (GAS) *A three-stage pattern of responses triggered by the effort to adapt to stressors*, 431–433
 General intelligence (g), 276
 Generalization of stimulus, 145–146
Generalized anxiety disorder *A condition that involves long-lasting anxiety that is not focused on any particular object or situation*, 505
 Generalized arousal, aggression and, 610–611
 Generalized social phobia, 504
 General principles, training in, 640
Generativity *The concern of adults in midlife with generating something enduring*, 418
Genes *Hereditary units located on chromosomes that contain biological instructions inherited from both parents, providing the blueprint for physical development*, 378
 role of in job satisfaction, 648–649
 role of in personality, 467–469
 Genetic influence
 aggression and, 607–608
 philosophical views of, 375–376
 schizophrenia, 521
 Genetics
 behavioral, 41–43
 intelligence and, 267–268
 Genital retraction syndromes, 496
Genital stage *The fifth and last of Freud's psychosexual stages, when sexual impulses reappear at the conscious level during adolescence*, 460
 Genuineness, 544
 Gesell, Arnold, 375–376
 Gestalt principles of perceptual grouping, 118–119
 Gestalt psychologists, 13, 118
Gestalt therapy *An active form of humanistic treatment that seeks to create conditions in which clients can become more unified, more self-aware, and more self-accepting*, 544–545
 GHB, 317–318
 Giftedness, 284–285
Glands *Organs that secrete hormones into the blood-stream*, 81
Glia *Cells in the nervous system that hold neurons together and help them communicate with one another*, 52
 brain damage and, 75
 Glove anesthesia, 509
 Glucose, 336
 Glutamate, 79, 206
 Goal-directed actions, 150
 Goals, 472
 learning-oriented vs. performance-oriented, 351
 relation of emotional responses to, 358
 setting, 353
Goal-setting theory *A theory of workplace motivation focused on the idea that employees' behavior is shaped by their intention to achieve specific goals*, 644
 Goldstein, Andrew, 562
 Gradients, 121
Grammar *A set of rules for combining the symbols, such as words, used in a given language*, 245
 language acquisition and, 248–249
 Grandin, Temple, 33
 Graphic rating forms, use of for subjective job performance appraisal, 634
 Grasping reflex, 381
 Gray, Jeffrey, 467–469
 Greenberg, Jeff, 578–579
 Griffith-Barwell, Perlene, 208
Ground *The contourless part of the visual field; the background*, 117–118
 Group differences in IQ, 269
 ethnic differences, 270–271
 socioeconomic differences, 269–270
 Grouping, 118–119
 Group leadership, 619–620
 Group polarization, 243
 Group processes, problem solving and decision making, 243–244
Group psychotherapy *Psychotherapy involving six to twelve unrelated individuals*, 552
 Groupthink, 244
 Growth factors, 76
 Growth needs, 355, 643
 Growth orientation, 475
Guide for the Care and Use of Laboratory Animals, 46
 Guidelines for more effective studying, 211–213
 Guilty knowledge test, 363
 Gustatory perception, 104. *See also Taste*
- H**
- Habits, 150
 eating and, 338–339
Habituation *Reduced responsiveness to a repeated stimulus*, 142
 Hall, G. Stanley, 13
Hallucinations *False or distorted perceptions of objects or events*, 299, 519–520
Hallucinogenic drugs *Psychoactive drugs that alter consciousness by producing a temporary loss of contact with reality and changes in emotion, perception, and thought*, 320
 ketamine, 321
 LSD, 321
 marijuana, 321–322
 Halo effect, 634
 Halstead-Reitan Battery, 670
 Hammer of the ear, 100
 Hangovers, 316–317
 Happiness, 354
 universal smile, 368
 Harlow, Harry, 394–395
 Harmful substances, prenatal exposure to, 378–379
 Head Start, 271–272
 Health and safety at work, work schedules and, 653–654
 Health-belief models, 449–450
Health care psychology (health psychology) *A field focused on understanding how psychological factors affect health and illness and which interventions help maintain and combat illness*, 6, 427–428
Health promotion *The process of altering or eliminating behaviors that pose risks to health and, at the same time, fostering healthier behavior patterns*, 449
Health psychologists *Psychologists who study the effects of behavior and mental processes on health and illness and vice versa*, 6
 promoting healthy behavior, 448–450
 Healthy behavior
 health beliefs and, 449–450
 promoting, 448–449
 stages of readiness for changes in health beliefs, 450
 Hearing
 absolute threshold for, 90
 aspects of the sensory system, 103
 auditory pathways to the brain, 102
 deafness, 101–102
 ear anatomy, 100–101
 encoding sounds, 102–103
 newborns, 380
 sound, 99–100
 Height in the visual field, 120
 Heinz dilemma, 411–412
 Hemineglect, 681–682
 Hemiparesis, 678–679
 Hemispheres of the brain, 73–74
 role of in emotions, 359
 Hering, Ewald, 97–98
 Heroin, 320
 addiction to, 532
 Hertz, 100
Heterosexuality *Sexual desire or behavior that is focused on members of the opposite sex*, 347
Heuristics *Mental shortcuts or rules of thumb*, 228–229
Higher order conditioning *A process through which a conditioned stimulus comes to signal another conditioned stimulus that is already associated with an unconditioned stimulus*, 148–149
 Hilgard, Ernest, 310
 dissociation theory of, 311
 Hinckley, John Jr., 532–533
Hindbrain *An extension of the spinal cord contained inside the skull where nuclei control blood pressure, heart rate, breathing, and other vital functions*, 59, 305
Hippocampus *A structure in the forebrain associated with the formation of new memories*, 61
 anterograde amnesia as a result of damage to, 207–208
 changes in, 206
 damage to due to epilepsy, 674–675
 inactivation of and explicit memory, 183
 place cells in, 166
 History effect, 282
 HIV, 446
 Hoffman, Phillip Seymour, 318
 Hofmann, Albert, 321
 Hogarth, William, 495
 Holmes, James, 562
 Holmes, Thomas, 430
 Homelessness, deinstitutionalization and, 571
Homeostasis *The tendency for physiological systems to remain stable by constantly adjusting themselves in response to change*, 331
Homosexuality *Sexual desire or behavior that is focused on members of one's own sex*, 347
Hormones *Chemicals secreted by a gland into the blood-stream, which carries them throughout the body*, 51, 81
 sexual, 346

- Horney, Karen, 461
 Hostility, 447–448
 Houston, Whitney, 318
Hue *The essential color determined by the dominant wavelength of light*, 96
Human biological rhythm *A cycle, such as waking and sleeping, that repeats about once a day*, 303–305
 Human brain, 58–59
 cerebral cortex, 62
 developmental changes in, 76–77
 fMRI studies of, 69–72
 forebrain, 60–62
 hindbrain, 59–60
 imaging techniques, 68–72
 lateralization of, 73–74
 major structures of, 59
 midbrain, 60
 neurotransmitters in, 78–80
 organization of, 64–65
 repairing damage to, 74–75
 sensory and motor cortex, 62–64
 techniques for studying function and structure of, 68
 Human development
 changes during the course of, 76–77
 perception and, 130–131
 personality and, 477–478
 Human factors, 4–5, 32
 Human factors psychology, 652
 Human Genome Project, 43
 Human growth factors, 76
 Human helplessness, 164–165
 Human immunodeficiency virus. *See HIV*
Humanistic approach *A perspective to psychology that focuses on how each person has a unique capacity to choose how to think and act*, 18–19
 Humanistic psychologists, 543
Humanistic psychology approach *The view that personality develops in accordance with each person's unique perceptions of the world*, 473–474
 evaluating, 475–476
 Maslow's growth theory, 475
 Roger's self theory, 474–475
 Human obesity, causes of, 337
 Human sexual behavior, Kinsey's survey of, 344–345
 Hume, David, 12
 Humors, 494
 Hunger, major factors controlling, 342–343
Hunger *The general state of wanting to eat*, 336
 biological signals for, 336–337
 Hunt, Earl, 276
 Huntington's disease, malfunction of GABA systems and, 79
 Hyperactivity, definition of, 528–529
 Hypermnesia, 200
Hypnosis *A phenomenon that is brought on by special techniques and is characterized by varying degrees of responsiveness to suggestions for changes in a person's behavior and experiences*, 309–310
 applications of, 311
 changes displayed during, 310
 experiencing, 309–310
 explaining, 310–311
 reports of pain in, 311
Hypnotic susceptibility *The degree to which a person responds to hypnotic suggestion*, 309
 Hypochondriasis. *See Illness anxiety disorder*
 Hypothalamic-pituitary-adrenocortical (HPA) system, activation of by stress, 433
Hypothalamus *A structure in the forebrain that regulates hunger, thirst, and sex drive*, 60
 hunger signals from, 337–338
- Hypothesis** *In scientific research, a specific, testable proposition about a phenomenon*, 29
 use of in correlational studies, 33–34
 use of in problem solving, 234
 Hysteria. *See Conversion disorder*
- I**
- IBMs Deep Blue, 238
 ICD-10, 498
Iconic memory *The sensory register for visual information*, 185
Id *According to Freud, a personality component containing basic instincts, desires, and impulses with which all people are born*, 458
 Ideas of reference, 519
 Ideational apraxia, 684
 Identical twins, behavioral genetics study of, 41–43. *See also Twin studies*
 Identity, development of self and, 410–411
Identity crisis *The phase during which an adolescent attempts to develop an integrated self-image as a unique person by pulling together self-knowledge acquired during childhood*, 411
 Ideomotor apraxia, 685
 Ignoring negative evidence, 235
 Illness, immune system and, 445–446
Illness anxiety disorder *A strong, unjustified fear of physical illness*, 508
 Illusory correlation, 589
Images *Mental representations of visual information*, 227
 Imagination, neuroplasticity and, 74
 Imbalanced relationships, 593–594
 Imitation, language acquisition and, 248–249
Immediate memory span *The maximum number of items a person can recall perfectly after one presentation of the items*, 186–187
 Imminent danger, 562
Immune system *The body's first line of biological defense against invading substances and microorganisms*, 445
 stress and, 446
 Impaired functioning, 492–493
 Implicit memories, 389
Implicit memory *The unintentional recollection and influence of prior experiences*, 181
 Implicit prejudice, 592
Implosive therapy *An exposure technique in which clients are helped to imagine being kept in a feared but harmless situation*, 548–549
 Impressions. *See also First impressions*
 forming, 581–582
 Improving your memory
 guidelines for more effective studying, 211–213
 mnemonic strategies for, 210–211
 Impulsive behavior, aggression and, 607
 Inattentional blindness, 132–133
 In-basket test, 631
Incentive theory *A theory that people are pulled toward behaviors that offer positive incentives and pushed away from behaviors associated with negative incentives*, 333
 Inclusive fitness, 614–615
 Incomplete knowledge, retrieving, 193–194
 Incongruence, 475
 Incubation, 231
 Independent self system, 478
Independent variable *The variable directly controlled by the researcher in an experiment*, 36
 Individual differences in motivation, 350–351
 Individualist vs. collectivist cultures, 21, 478
 Individual temperament, 393–394
 Inductive reasoning, 229
- Industrial and organizational (I/O) psychology** *The science of behavior and mental processes in the workplace*, 627–628
Industrial psychologists *Psychologists who study ways to improve efficiency, productivity, and satisfaction among workers and the organizations that employ them*, 7
 Industrial psychology, 7–8
 Ineffective leadership, 656
 Infancy, milestones of development, 388
 Infantile amnesia, 389
 Infants
 attachment formation by, 395
 cognitive development of, 382–384
 effect of day care on emotional development of, 397–398
 individual temperament of, 393–394
 motor development of, 381
 new views on cognitive development of, 386–387
 perception of, 130–131
 stages of learning development, 247–248
 variations in attachment, 395–396
Infant vocalizations *Early sounds, such as babblings, made by babies*, 247
 Inferences, 14, 228
Inferential statistics *A set of mathematical procedures that help psychologists make inferences about what their research data mean*, 44
Inflammation *An immune system response that combats infectious agents and helps to heal injuries*, 445–446
Informal reasoning *The process of evaluating a conclusion based on the evidence available to support it*, 228–230
 anchoring bias, 230
 availability heuristic, 230–231
 representativeness heuristic, 230
 Information processing, measuring, 221–222
Information-processing model of cognitive development *A view of cognitive development which focuses on the processes of taking in, remembering or forgetting, and using information*, 387
Information-processing model of intelligence *An approach to the study of intelligence that focuses on mental operations, such as attention and memory, that underlie intelligent behavior*, 276–277
Information-processing model of memory *A model that suggest that information must pass through sensory memory, short-term memory, and long-term memory in order to become firmly embedded in memory*, 182–184
Information-processing system *Mechanisms for receiving information, representing it with symbols, and manipulating it*, 220–221
 Ingroup, 589
 Inherited ability, IQ as a measure of, 267–268
 Injunctive norms, 597
 Innate expressions of emotion, 366–367
 Inpatients, 539–540
 Insanity
 definition of, 532
 legal protections, 532–533
 Insecure attachments, 396
Insight *A sudden understanding of what is required to solve a problem*, 166–167
Insomnia *A sleep disorder in which a person does not get enough sleep to feel rested*, 301
Instinct doctrine *A view that behavior is motivated by automatic, involuntary, and unlearned responses*, 330
 mate selection and, 331
Instinctive behaviors *Innate, automatic dispositions to respond in particular ways to specific stimuli*, 330

- Instincts, life and death, 458
 Instrumental conditioning, 150–151
 Insulin, 336
 Integrity tests, 631
Intellectual development disorder *Defined in DSM-5 as an IQ at or below 70, starting in childhood, and affecting a person's ability to function as compared to other people of the same age, 285*
 Intellectual disability, 285–286
 categories of, 285
 Intellectual giftedness, 284–285
Intelligence *Personal attributes that center around skill at information processing, problem solving, and adapting to new or changing environments*
 approaches to, 280–281
 difficulty in defining, 264
 diversity in, 275–277
 emotionality and the measurement of, 266–267
 giftedness, 284–285
 inheritability of, 267–268
 intellectual disability, 285–286
 multiple intelligences, 279–280
 testing for, 259–263
 triarchic theory of, 277–279
Intelligence quotient (IQ) *An index of intelligence that reflects the degree to which a person's score on an intelligence test deviates from the average score of others in the same age group, 263*
 calculating, 262–263
 calculation of for Stanford-Binet test, 260
 conditions that can improve, 271–272
 group differences in, 269–271
 influences on, 275
 inherited ability and, 267–268
 normal distribution of, 262
 Intelligence tests, 274–275
 bias in, 272–274
 contemporary, 261–262
 evaluating, 263–266
 history of, 259–261
 limitations of, 260–261
 statistical reliability and validity of, 263–266
 Interaction of the senses, 103–104
 Interdependence in relationships, 595
 Interdependent self system, 478
Interference *The process through which storage or retrieval of information is impaired by the presence of other information, 201*
 procedures for studying, 201
 Intermittent reinforcement, 155–156
 Internal attribution, 582–584
 Internalizing disorders, 529
 Internalizing of values, 458
 Internal noise, 90
 Internal reward, 333–334
 Internals, 471
 Internal working models, 397
International Classification of Diseases. See ICD-10
 Interpersonal attraction
 intimate relationships and love, 594–596
 keys to, 593–594
 Interpersonal intelligence, 280
 Interpersonal therapy, 542
 Interposition, 120
 Interrater reliability, diagnosis of psychological disorders and, 500
 Interviews
 use of during personality assessment, 480–481
 use of for job applicants, 631
 Intimate commitments, 416–417
 Intimate relationships, 594–596
 Intrapersonal intelligence, 280
 Intrapsychic conflicts, 458
Intrinsic motivation *Engaging in behavior simply for the feelings of pleasure, satisfaction, or sense of competence or independence it brings, 333–334*
 Introspection, 12
 Introversion, 461
 Involuntary control, 132
 Involuntary reflexes, 58
 IQ. *See* Intelligence quotient
Iris *The part of the eye that gives it its color and adjusts the amount of light entering it, 93*
 Irresistible impulse test, 533
 Itching, 111
J
 James, William, 13–14, 361–363
 James-Lange theory of emotion, 362–363
 Janszky, József, 115–116
Jet lag *Fatigue, irritability, inattention, and sleeping problems caused by air travel across several time zones, 304*
 Jigsaw technique, 7, 590–591
Job analysis *The process of collecting information about jobs and job requirements that is used to guide hiring and training decisions, 629–630*
 Job applicant interviews, 631
 Job-oriented approach to job analysis, 629
Job performance *A measure of how well employees are doing in various aspects of their work, usually recorded in an annual appraisal, 632–633*
 intelligence and, 264–265
 job satisfaction and, 649
 methods of measuring, 633–636
 motivation and, 353
 use of personality tests to predict, 485
 Job requirements, job satisfaction and, 645–646
Job satisfaction *The degree to which people like or dislike their jobs, 644*
 consequences of, 649–651
 factors affecting, 644–649
 measuring, 644
 Johnson, Virginia, 344
 Jones, Gilbert Haven, 21
 Jung, Carl, 461
 Jury selection, use of trait theory during, 464
Just-noticeable difference (JND) *The smallest detectable difference in stimulus energy (also called difference threshold), 92*
K
 Kahneman, Daniel, 241
 Keebler, Richard, 286
 Kelley, Chris, 318
 Kelly, Lisa Robin, 318
 Kendra's Law, 562
 Ketamine, 321
 Kinesthesia, 66–67, 109
Kinesthetic perception *The proprioceptive sense that tells us where the parts of the body are with respect to one another, 109, 113*
 Kin selection, 615
 Kinsey, Alfred, 344–345
 Knauss-Trump, Melania, 331
 Knowledge
 industrial and organization assessment of, 629
 measurement of on Stanford-Binet test, 261
 Piaget's theory of development of, 382–386
 skill, ability, and other personal characteristics (See KSAOs)
 Koffka, Kurt, 13
 Kohlberg, Lawrence, 411–413
 Kohlberg's stages of moral reasoning, 411–413
 limitations of, 413
 Köhler, Wolfgang, 13, 166–167
 Koro, 496
Korsakoff's syndrome *An amnestic condition in people whose thiamine (vitamin B1) level is depleted by inadequate nutrition or alcoholism, 675*
 KSAOs, 629
 employee recruitment and, 637
 employee selection and, 638
 job analysis and, 629
 Kyōgo Gōen, 496

L

- Labeling, psychological disorders and, 501
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- Lange, Carle, 362
-
- Language acquisition
-
- bilingualism, 249–250
-
- biological bases for, 249
-
- conditioning, imitation, and rules, 248–249
-
- Language disorders (aphasias)**
- Neuropsychological disorders in which there are disruptions in the ability to speak, read, write, and understand language, 683–684*
-
- Language**
- Symbols (and a set of rules for combining them) that are used as a means of communicating, 245*
-
- acquisition of, 248–250
-
- areas of the brain related to, 65–66
-
- elements of, 245–246
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- split-brain studies, 73–74
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- understanding speech, 246–247
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- use of by nonhumans, 250–252
-
- Late adulthood, 413
-
- cognitive changes in, 415–416
-
- death and dying, 419–420
-
- longevity, 419–420
-
- social changes during, 418–419
-
- Latency period**
- The fourth of Freud's psychosexual stages, in which sexual impulses become dominant and the child focuses on education and other matters, 460*
-
- Latent content of dreams, 541
-
- Latent learning**
- Learning that is not demonstrated at the time it occurs, 165–166*
-
- Lateral hypothalamus, hunger signals from, 337–338
-
- Lateralization (lateral dominance)**
- The tendency for one cerebral hemisphere to excel at a particular function or skill compared with the other hemisphere, 73–74*
-
- Law of effect**
- A law stating that if a response made in the presence of a particular stimulus is rewarded, the same response is more likely to occur when that stimulus is encountered again, 150*
-
- Law of parsimony, 31
-
- Lazarus, Richard, 365, 437, 439
-
- Leader-member exchange (LMX) theory**
- A theory suggesting that leaders tend to supervise ingroup and outgroup employees in different ways, 657*
-
- Leader-member interactions, 657–658
-
- Leadership styles, 619–620
-
- charismatic, 658–659
-
- effective vs. ineffective, 656
-
- Learned behavior, 17–18, 163–165, 545
-
- Learned helplessness**
- A process in which a person or animal stops trying to exert control after experience suggests that no control is possible, 163–165*
-
- depressive and bipolar disorders and, 517
-
- Learned patterns of thinking, 470
-
- Learning goals, 351
-
- Learning**
- The modification of preexisting behavior and understanding, 12, 141*
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- active, 172–173
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- behaviorism and, 14

- classrooms across cultures, 173–174
 cognitive processes in, 163
 insight and, 166–167
 latent learning and cognitive maps, 165–166
 learned helplessness, 163–165
 link of with anxiety and obsessive-compulsive disorders, 507–508
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 observational, 167–171
 personality behaviors, 470
 skills, 173
 stages of language development, 247–248
Learning theories of prejudice, 590
 Lecture notes, 213
 Ledger, Heath, 318
 Leniency error, 634
Lens *The part of the eye directly behind the pupil*, 93
 Leptin, 337
 Lesion analysis, 668
Lesion *An area of damaged tissue in the brain*, 667
 Leukocytes, 446
 Levels of consciousness, 294–295
Levels-of-processing model of memory *A model that suggests that memory depends on the degree or depth to which we mentally process information*, 181
 Licensed professional counselors, 540
 Lie detection, 363
 Life changes, 430
 Life-change units (LCUs), 430–431
 Life Experiences Survey (LES), 431
 Life instincts, 458
 Life outcomes, 480
 Life-saving punishment, 159–160
Light
 focusing, 93
 perception of, 92–93
 shadow and, 121
Light intensity *A physical dimension of light waves that refers to how much energy the light contains and that determines our experience of its brightness*, 92–93
Light wavelength *A psychosocial dimension of light waves that refers to their length and that produces sensations of different colors*, 92–93
 Likelihood principle, 119
 Limbic system, 61, 675–676
 role of in emotional response, 359
 Linear perspective, 121
 Linguistic intelligence, 279–280
 Linkages, 9–10
 Lithium, 566
 Lobes of the brain, 62
 Localization-related epilepsy, 115–116
 Location, two-dimensional, 119–120
Location of function *The idea that specific psychological functions can be affected by damage to specific brain areas*, 666–667
 Locke, John, 12, 375
Locus coeruleus *A small nucleus in the reticular formation that is involved in directing attention*, 59, 305
 Loftus, Elizabeth, 204
 Logical-mathematical intelligence, 279–280
 Logical reasoning, 228
Logic *A system of formulas for drawing valid conclusions*, 228
 Longevity, 419–420
 Longitudinal studies, 282
 Long-term depression, 206
Long-term memory (LTM) *The stage of memory that researchers believe has an unlimited capacity to store new information*, 183–184
 comparison with short-term memory, 189–190
 encoding in, 188–189
 factors affecting retrieval from, 192
 forgetting from, 201–202
 role of in understanding new information, 184
 storage capacity of, 189
 Long-term potentiation, 206
 Long-wavelength cones, 97
Looming *A motion cue whereby rapid expansion in the size of an image fills the available space on the retina*, 122
 Loose associations, 519
 Loss aversion, 241
 Losses, decision making biases and, 241
Loudness *A psychological dimension of sound determined by the amplitude of a sound wave*, 99
 Love, 355
 adolescents and, 409
 interpersonal relationships and, 594–596
 Lowball technique, 602
 LSD, 321
Lucid dreaming *Being aware that a dream is a dream while it is occurring*, 308
 Luria-Nebraska Neuropsychology Battery, 670
 Lysergic acid diethylamide. *See* LSD
- M**
- Macular degeneration, 95
 Magnetic resonance imaging. *See* MRI
 Magnetic seizure therapy (MST), 564
 Maintenance of memories, 186
Maintenance rehearsal *A memorization method that involves repeating information over and over to keep it in memory*, 181
Major depressive disorder *A condition in which a person feels sad and hopeless for weeks and months, often losing interest in all activities and taking pleasure in nothing*, 512
 Major neurocognitive disorder, 686. *See also* Dementia
 Male sex hormones, 81
Mania *An elated, active emotional state*, 514–515
 Manic depression, 515
 Manifest content of dreams, 541
 Manipulation of memory, 186
 Manning, Archie, 377
 Manning, Eli, 377
 Manning, Peyton, 377
 Marijuana, 314, 321–322
 Marriage, 416–417
 Marriage and family therapists, 540
 Maslow, Abraham, 19, 355, 475–476
 Maslow's Hierarchy, 355
 Mass conformity, 600
Massed practice *Trying to learn new information in a single long study period*, 211
 Massed training, 640
 Masters, William, 344
Matching hypothesis *The notion that people are most likely to form committed relationships with those who are similar to themselves in physical attractiveness*, 594
 Mate selection, instinct doctrine and, 331
Maturation *Natural growth or change triggered by biological factors independent of the environment*, 376
 May, Rollo, 545
 McDermott, Kathleen, 195–196
 McDougall, William, 330
 MDMA, 320
 Means-end analysis, 231
 Measuring stressors, 430–431
 Mechanisms of pattern recognition, 128. *See also* Processing perceptions
 Mediating factors
- psychological stressors and physical health, 428–429
 reactions to stress, 436–437
 Medical model of psychological disorders, 495
Meditation *A set of techniques used to focus on the present moment, which create an altered state of consciousness characterized by inner peace and tranquility*, 312
 Medium-wavelength cones, 97
Medulla oblongata (medulla) *An area in the hindbrain that controls blood pressure, heart rate, breathing, and other vital functions*, 59
 Melatonin, 304–305
 Melodic intonation therapy, 66
 Memory, 12
 basic processes of, 179–180
 biochemistry of, 206
 biological bases of, 205
 brain structures involved in, 207–210
 consolidating, 166
 constructing, 194–199
 context-specific, 191
 development and, 389
 development of in children, 388
 exploring processes of, 204
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 long-term, 188–189
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 nature of, 179
 preconscious, 294
 repression and recovery of, 202–205
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 role of the hippocampus in, 61–62
 sensory, 185
 short-term, 186–188
 stages of, 183
 state-dependent, 192
 storage of, 185–190
 techniques for improving, 210–213
 types of, 180–181
 working, 186–188
 Memory codes, 179
 Men. *See also* Gender
 sexual response cycle of, 343–344, 346
Menopause *The cessation of a woman's reproductive capacity*, 414
 Mental abilities over the lifespan, 415
Mental age *A score corresponding to the age level of the most-advanced items a child could answer correctly on Alfred Binet's first intelligence test*, 259–260
 Mental chronometry, 221–222
 Mental disorders
 annual incidence of in the U.S., 491
 biological factors, 494–495
 classifying, 498
 legal criteria, 533
 stress and, 435–436
 Mental illness, 495. *See also* Psychological disorders
 legal protections, 532–533
 Mental incompetence, 533
Mental models *Sets of propositions that represent people's understanding of how things look and work*, 225–226, 236
 application of, 226
 Mental processes, 276
 biology of, 51
 characteristics of collectivist vs. individualist cultures, 21
 functions of, 13
 subconscious, 294–295
 use of biotechnology to study, 14–15
 Mental processing without awareness, 295–296

- Mental representations, 146
 cognitive maps, 227
 concepts, 223–224
 development of in infants, 387
 images, 226–227
 mental models, 225–226
 propositions, 224
 schemas, 224–225
 scripts, 225
 secure attachments and, 397
 use of by infants, 384
- Mental set** *The tendency for old patterns of problem solving to persist*, 234–235, 434
- Mere-exposure effect, 593
- Mesmer, Anton, 309
- Mesmerism, 309. *See also Hypnosis*
- Methods and Welfare Considerations in Behavioral Research with Animals*, 46
- Methylenedioxymethamphetamine. *See MDMA*
- Midbrain** *A small structure between the hindbrain and forebrain that relays information from the eyes, ears, and skin and that controls certain types of automatic behaviors*, 60
- Middle adulthood, 413
 cognitive changes in, 414
 social changes during, 418
- Middle ear** *The part of the ear that contains the hammer, anvil, and stirrup, which transmit sound from the tympanic membrane to the oval window*, 100
- Midlife transition, 418
- Migraine, treatment of with TMS, 68
- Mild cognitive impairment (MCI), 686
- Milgram, Stanley, obedience studies of, 602–605
- Mind control, 296
- Mindfulness-based cognitive therapy, 552
- Mindfulness training, 546
- Minimally conscious state (MCS), 676
- Minnesota Multiphasic Personality Inventory. *See MMPI*
- Minority groups
 bias of intelligence tests and, 272–274
 differences in IQ scores of, 269–270
 intelligence testing and, 266
- Minority influence, conformity and, 600–601
- Mirror neuron mechanisms, 71
 autism spectrum disorder and, 529–530
 operational learning and, 167
- Mischel, Walter, 472–473
- Miscommunication, interpersonal conflict and, 618
- Misinformation effect, 198
- Mitochondria, 52
- MMPI, 483–484
- M'Naught rule, 533
- Mnemonic strategies** *Methods for organizing information in order to remember it*, 210–211
- Modal action patterns, 330
- Modeling
 aggression and, 608–609
 language acquisition and, 248–249
 observational learning and, 167–171
- Modeling** *A behavior therapy method in which desirable behaviors are demonstrated for clients*, 547
- Modules** *Regions of the brain that perform their own unique kind of analysis of the information they receive*, 667–668
- Molaison, Henry, 207–208, 674–675
- Moniz, Antonio Egas, 563
- Monkeys, attachment formation by, 394–395
- Monoamine oxidase inhibitors (MAOIs), 565
- Monocular cues, 121
- Monteith, Corey, 318
- Mood congruency, effects of on memory, 192
- Mood disorders, 512. *See also Depressive disorders*
- Moods, event-related changes in, 354
- Moral development** *The growth of an individual's understanding of the concepts of right and wrong*, 412–413
- Moral insanity, 525. *See also Antisocial personality disorder*
- Moral reasoning, Kohlberg's stages of, 411–413
- Morpheme** *The smallest unit of language that has meaning*, 245
- Morphine, 320
- Mortality effect, 282
- Motion parallax** *A depth cue whereby a difference in the apparent rate of movement of different objects provides information about the relative distance of those objects*, 121
- Motion perception, 122
- Motivated forgetting, 202
- Motivational theories of prejudice, 589
- Motivation** *The influences that account for the initiation, direction, intensity, and persistence of behavior*
- achievement, 350–351
 creative thinking and, 240
 employee, 642–644
 intrinsic and extrinsic, 333–335
 IQ scores and, 269–270
 sources, theories and types of, 335
 sources of, 329–330
 intensity, and persistence of behavior, 91, 127, 329
- Motive** *A reason or purpose for behavior*, 329
- Motives
 relations and conflicts among, 354–355
 stress and conflict of, 356–357
- Motor cortex** *The part of the cerebral cortex whose neurons control voluntary movements in specific parts of the body*, 62–64
- Motor development, 376
 newborns and infants, 381
- Motor neurons** *Cells in the nervous system that the brain uses to influence muscles and other organs to respond to the environment in some way*, 57
- Movement control, disorders of, 684–685
- MRI, 67
 brain abnormalities due to schizophrenia, 521
 use of in combination with PET scans, 67
- Mucous membranes, 105
- Müller-Lyer illusion, 124
- Multicultural countries, 22
- Multiple approach-avoidance conflicts, 356
- Multiple hypotheses, 234
- Multiple intelligences, 279–280
- Multiple memory systems model** *A model that suggests the existence of specialized and separated memory systems in the brain*, 182–183
- Multiple personality disorder. *See Dissociative identity disorder*
- Münsterberg, Hugo, 628
- Musical intelligence, 280
- Myelin, 54
- N**
- Nanometer, 92
- Narcissistic personality disorder, 524
- Narcolepsy** *A daytime sleep disorder in which a person suddenly switches from an active waking state into REM sleep*, 301–302
- National Health and Social Life Survey, 344–345
- National Institute of Mental Health, Research Domain Criteria (RDoC), 500–501
- Natural analgesics, 111–112
- Natural concepts, 223–224
- Naturalistic intelligence, 280
- Naturalistic observation** *The process of watching without interfering as a phenomenon occurs in the natural environment*, 31
- Natural killer cells, 446
- Natural selection** *The evolutionary mechanism through which Darwin said the fittest individuals survive to reproduce*, 16
- Nature vs. nurture, 41–43, 375
 aggression and, 607
 genes and the environment, 377
 intelligence measures and, 267–268
 Piaget's ideas on, 376–377
- Nearsightedness, 94
- Necker cube, 294
- Need for achievement** *The degree to which a person establishes specific goals, cares about meeting them, and experiences satisfaction by doing so*, 350–351
- development of, 351–352
- Needs** *Biological requirements for well-being*, 332
 motivation and, 329
- Negative affect, aggression and, 610
- Negative attributional style, 517
- Negative correlation, 33–34
- Negative evidence, ignoring, 235
- Negative punishment, 158
- Negative reinforcement, 152, 161
- Negative reinforcers** *The removal of unpleasant stimuli*, 150
- Negative symptoms, 520
- Negative thinking, 551
- Neglected children, 401–402
- Neo-Freudian treatment methods, 542
- Neologisms, 519
- NEO-PI-3, 482–483
- Nerve cells** *Fundamental units of the nervous system*, 52–53, 56. *See also Neurons*
- communication between, 54
- Nerve deafness, 101
- Nervous system** *A complex combination of cells whose primary function is to allow an organism to gain information about what is going on inside and outside the body and to respond appropriately*
- cells of, 51–55
 functions of, 52
 organization of, 55–56
- Networks of association, 162–163
- Networks of modules in the brain, 667–668
- Neural network models, 162
 computer problem solving using, 238–239
- Neural network models of memory** *Memory models in which new experiences are seen as changing one's overall knowledge base*, 182
 constructive memory and, 196–197
- Neural networks** *Neurons that operate together to perform complex functions*, 55
- Neural plasticity** *The ability to create new synapses and to change the strength of synapses*, 74–76
- Neural receptors** *Cells that are specialized to detect certain types of energy and convert it into neural activity*, 88
 encoding by, 89–90
- Neural stem cells, use of to repair brain damage, 75
- Neurobiological model of psychological disorders, 495
- Neurodegenerative diseases** *Conditions in the brain that result in a gradual loss of nerve cells and of the cognitive or other functions in which those cells are normally involved*, 672–673
- Neurodevelopmental abnormalities, schizophrenia and, 522
- Neurodevelopmental disorders, 528–530
- Neurodiversity, 501

- Neuroeconomics, 70
 Neurogenesis, 75
 Neuroimaging, use of to measure information processing, 222
 Neuroleptics, 564–565
Neurons Fundamental units of the nervous system, 52–53, 56
 communication between, 54
 firing rate of, 70
 olfactory, 105–106
 Neuropathy, 111
 Neuropeptide Y, 337
 Neuroplasticity, 74–76
Neuropsychological assessment Testing a patient's intelligence, memory, reading, motor coordination, and other cognitive and sensory functions in an effort to locate problems in the brain responsible for neuropsychological symptoms, 670
Neuropsychological disorders
 amnesia, 673–675
 aphasias, 683–684
 consciousness disturbances, 676–679
 dementia, 686–688
 movement control, 684–685
 perceptual disturbances, 679–682
Neuropsychology An area of psychology that studies the relationships among brain activity, thinking, and behavior, 32
Neuropsychology The subfield of psychology whose goal is to explore and understand the relationships among brain processes, human behavior, and psychological functioning, 665–666
 brief history of, 666–667
Neuroscience The scientific study of all levels of the nervous system, including neuroanatomy, neurochemistry, neurology, neuropsychology, and neuropharmacology, 10
 Neuroticism, 465
 Neuroticism Extraversion Openness Personality Inventory. See NEO-PI-3
Neurotransmitters Chemicals that assist in the transfer of signals from one neuron to another, 54–55, 54–56, 206, 570
 classes of, 78–80
 prosocial behavior and activation of, 615
 psychopharmacology and, 313–314
 role of in anxiety disorders, 506
 role of in schizophrenia, 521
 Neurotransmitter system, 77
 Newborns, 380
 reflexes and motor skills, 381
 vision and other senses of, 380–381
 Nicotine, 319
 prenatal exposure to, 379
Nightmares Frightening dreams that take place during REM sleep, 303
Night terrors The occurrence of horrific dream images during N3 sleep, followed by a rapid awakening and a state of intense fear, 303
 Nitric oxide, 79
 Nogo, 75
Noise The spontaneous random firing of nerve cells that occurs because the nervous system is always active, 90
 Nolen-Hoeksema, Susan, 517–518
 Nonassociative learning, 142
Nonconscious level The level of consciousness at which reside processes that are totally inaccessible to conscious awareness, 294
 Non-Freudian theorists, 460–461
 Nongenetic factors, influence of on IQ scores, 270–272
 Nonhuman language, 250–252
Nonprojective personality measures Tests that list clear, specific questions, statements, or concepts to which people are asked to respond, 481–484
 Nonshared environment, 468
Nonstate theories of hypnosis Theories, such as role therapy, proposing that hypnosis does not create an altered state of consciousness, 310–311
 Nonverbal intelligence tests, 261
 Norepinephrine, 78
 emotional response and, 360
 increasing release of with CNS stimulating drugs, 318
 Normality, defining, 492–493
Norms Descriptions of the frequency at which particular scores occur, allowing scores to be compared statistically, 263
 social, 597–598
 use of by neuropsychologists, 670
 Norm violation, 492
 Novel stimuli, 141
NREM (non-rapid eye movement) sleep Sleep stages N1, N2, and N3; they are accompanied by gradually slower and deeper breathing; a calm, regular heartbeat; reduced blood pressure; and slower brain waves (Stage N3 is called slow-wave sleep), 300
 Nucleus, 52
O
Obedience Changing behavior in response to a demand from an authority figure, 602–603
 evaluating research on, 604–606
 factors affecting, 603–604
 Obedience studies, 602–604
Obesity A condition in which a person is severely overweight, 339–341
 Objective personality measures, 481–484
 Objective reality, 87
 false memories and, 195–196
Object permanence The knowledge that an object exists even when it is not in view, 384, 386
 Object relations theory, 461
 Object relations therapy, 542
 Observational data, correlational studies of, 34
Observational learning Learning how to perform new behaviors by watching others, 167–171
 phobias and, 507–508
Observational methods Procedures for systematically watching behavior in order to summarize it for scientific analysis, 31–32, 39
 Observer ratings, 480
Obsessions Persistent, upsetting, and unwanted thoughts that interfere with daily life and may lead to compulsions, 505
Obsessive-compulsive disorder (OCD) A disorder in which a person becomes obsessed with certain thoughts or feels a compulsion to do certain things, 505, 511–512
 learning and, 507–508
 Occipital lobe, 62
Occupational health psychology A field concerned with psychological factors that affect the health, safety, and well-being of employees, 652
Ocular accommodation The ability of the lens to change its shape and bend light rays so objects are in focus, 94
 Odd-eccentric cluster of personality disorders, 523–524
 Odor, 104
 Odorant receptors, 106
Oedipal complex The notion that young boys' impulses involve sexual feelings for the mother and the desire to eliminate the father, 460
 Old age. See also Late adulthood
 cognitive changes in, 415–416
 death and dying, 419
 Olfaction, 104. *See also Smell*
Olfactory bulb A brain structure that receives messages regarding smell, 106
 Olfactory nerve, 105
 Olfactory neurons, 105–106
Olfactory perception (sense of smell) The sense that detects chemicals that are airborne; also called olfaction, 104
 Olfactory system, 105
 O*NET, 630
One-word stage A stage of language development during which children tend to use one word at a time, 247
 Online communication, prevalence of among adolescents, 408
 Open-ended interviews, use of during personality assessment, 481
 Openness, 465
Operant A response that has some effect on the world, 150
 Operant behavior, forming and strengthening, 154–157
Operant conditioning A process in which responses are learned on the basis of their rewarding or punishing consequences, 150. *See also Behavior therapy*
 applications of, 160–161
 Operant shaping, communication of emotion and, 368–369
Operational definition A statement that defines the exact operations or methods used in research, 29–30
Opiates Psychoactive drugs that produce both sleep-inducing and pain-relieving effects, 320
 receptors for in the brain, 79
 Opium, 320
Opponent-process theory A theory of color vision stating that the visual elements that are sensitive to color are grouped into red-green, blue-yellow, and black-white pairs, 97–98, 150
 Optical flow, 122
 Optic chiasm, 95–96
Optic nerve A bundle of fibers that carries visual information to the brain, 95
 Optimal level of arousal, 333
 Optimism, unrealistic, 584
 Optimistic cognitive style, 165
 Options, evaluation of for decision making, 241
 Optogenetics, 69, 72
Oral stage The first of Freud's psychosexual stages, in which the mouth is the center of pleasure, 459
 Orbitofrontal cortex, 104
 Organization, measuring changes in across the life span, 283
Organizational citizenship behavior (OCB) A willingness to go beyond formal job requirements in order to help coworkers and/or the organization, 633, 649–650
Organizational psychologists Psychologists who study ways to improve efficiency, productivity, and satisfaction among workers and the organizations that employ them, 7
 Organizational psychology, 7–8
 Organ systems, involvement of General Adaptation Syndrome, 432
 Orgasm, sensory experience of, 115–116
 Orgasmic stage of sexual response cycle, 346
 Otoliths, 114
 Outer membrane of cells, 52
 Outgroups, 589
 Outpatients, 540
 Oval window, 100
 Overconfidence, 242
 Overcontrol disorders of children, 529
 Overlearning, 640
 Overt orienting, 132

- Oxytocin** relationship of levels of to prosocial behavior, 615 release of in response stress, 442–443
- P**
- Pain**, 110 emotional aspects of, 110 gate control theory of, 110–111 natural analgesics, 111–112 relief of from acupuncture, 112–113 reports of in hypnosis, 311
- Palmer, Stephen**, 118–119
- Panic attacks**, 505
- Panic disorder** *Anxiety in the form of sudden, severe panic attacks that appear without obvious cause*, 505
- Papillae** *Structures in the mouth on which taste buds are grouped*, 107
- Parallel distributed processing (PDP), 182
- Parallel processing, 133
- Paraprofessionals, 540
- Parasympathetic nervous system** *The subsystem of the autonomic nervous system that typically influences activity related to the protection, nourishment, and growth of the body*, 57, 361
- Paraventricular nucleus, 337
- Parenting**, 416–417
- Parenting styles** *The varying patterns of behavior—ranging from permissive to authoritarian—that parents display as they interact with and discipline their children*, 399–400 culture and, 400–401
- Parents, development of relationships with, 398–399
- Parietal lobe, 62
- Parkinson's disease, 78
- Parsody, 684
- Partial reinforcement effect** *A phenomenon in which behaviors learned under a partial reinforcement schedule are more difficult to extinguish than those learned on a continuous reinforcement schedule*, 157
- Partial reinforcement schedules, 155–156
- Participant modeling, 547
- Participants' expectations, 37–38
- Passionate love, 595
- Passions, 358
- Pasteur, Louis, 445
- Pastoral counselors, 540
- Pathways in the brain, 57
- Pattern recognition, mechanisms of, 128
- Patterson, Penny, 251
- Pavlov, Ivan Petrovich, 143
- Pavlov's experiments, 143–144
- Peak experiences, 475
- Peers development of relationships with, 399 friendships with and popularity, 401–402 relationships of adolescents, 408–409
- Penis envy, 460
- Peptides, 79 YY3-36, 338
- Perceived costs, health beliefs and, 450
- Perceived size, 123
- Perception of control, 438
- Perception** *The process through which people take raw sensations from the environment and give them meaning using knowledge, experience, and understanding of the world*, 88, 116–117, 474 bottom-up processing, 126 categorization of, 125 constancy, 122–123 culture and experience, 129 eyewitness testimony, 197–199
- human development and, 130–131 kinesthetic, 109 location and distance, 119–121 mechanisms of pattern recognition, 128 motion, 122 size illusions, 123–124 top-down processing, 126–127
- Perceptual constancy** *The perception that objects retain the same size, shape color, and other properties despite changes in their retinal image*, 122–123
- color, and other properties despite changes in their retinal image*, principles of, 124–125
- Perceptual disturbances** *Neuropsychological disorders in which there are impairments in the ability to organize, recognize, interpret, and make sense of incoming sensory information*, 679–682
- Perceptual failures, 117
- Perceptual grouping, Gestalt principles of, 118–119
- Perceptual organization, principles of, 117–119, 124–125
- Perceptual reasoning, measurement of on WISC, 262
- Perceptual set, 127
- Performance appraisals establishing criteria for, 632–633 objective measures, 633–634 subjective measures, 634–635
- Performance goals, 351
- Performance-level criteria, 642
- Peripheral nervous system (PNS)** *The parts of the nervous system not housed in bone*, 56–57
- Peripheral responses, observation of, 362
- Peripheral route to attitude change, 586
- Peripheral theory of emotion, 362–363
- Perls, Frederick S. (Fritz), 544
- Perls, Laura, 544
- Permissive parents** *Parents who give their children complete freedom and lax discipline*, 400
- Persistent depressive disorder** *A pattern of depression in which the person shows the sad mood, lack of interest, and loss of pleasure associated with major depressive disorder but to a lesser degree and for a longer period of time*, 513
- Persistent vegetative state (PVS), 676
- Personal characteristics, industrial and organization assessment of, 629
- Personal development plans, 639
- Personal identity, 580 development of, 410–411
- Personality characteristics, obedience and, 604
- Personality disorders** *Long-standing, inflexible ways of behaving that become styles of life that create problems for the person affected and/or others*, 523–527
- Personality psychologists** *Psychologists who study the characteristics that make individuals similar to or different from one another*, 5
- Personality psychology, 5
- Personality tests, 480–481 nonprojective (objective), 481–484 projective measures, 481
- Personality** *The pattern of psychological and behavioral characteristics by which each person can be compared and contrasted with other people* arousal and, 333 assessing, 480–481 development of over time, 479–480 Eysenck's dimensions of, 466–467 happiness and, 354 health and, 443–444 linkage with culture and human development, 477–478 major approaches to, 476–477 nonprojective measures of, 481–484
- profiles of from trait theory, 464 projective measures of, 481 prosocial behavior and, 615 stress and, 441–442 structure of, 457–458 tests of and employee selection, 484–485
- Personality traits** *A set of stable characteristics that people display over time and across situations*, 463 inheritability of, 467–469
- Personalization, 551
- Personal suffering, 492
- Personal threat, perception of for potential illness, 449
- Person-centered therapy** *A type of therapy in which the client decides what to talk about, and when, without direction, judgment, or interpretation from the therapist*, 543–544
- Person-oriented approach to job analysis, 629
- Persuasive messages, attitude change and, 586
- Pessimistic explanatory style, 165
- PET scans, 67 use of in combination with MRI, 67 use of to measure information processing, 222
- P-factor, 501
- Phallic stage** *The third of Freud's psychosexual stages, in which the focus of pleasure shifts to the genital area*, 460
- Phantom limb sensations, 87
- Phenomenological approach, 18
- Phenomenological approach to personality, 474. See also Humanistic psychology approach
- Phenomenologists, 543
- Phenomenology, 474
- Phenothiazines, 564
- Phenylketonuria (PKU), 286
- Pheromones** *Chemicals that are released by one creature and detected by another, shaping the second creature's behavior or psychology*, 107
- Phi phenomenon, 13
- Phobia** *An anxiety disorder that involves strong, irrational fear of an object or situation that does not objectively justify such a reaction*, 504
- Phobias, 149–150, 504 learning and, 507–508 treating using behavioral therapy, 546–550
- Phoneme** *The smallest unit of sound that affects the meaning of speech*, 245
- Photographic memory, 189
- Photoreceptors** *Specialized cells in the retina that convert light energy into neural activity*, 94
- Phrenology, 69
- Physical attractiveness, 594
- Physical changes in adulthood, 413
- Physical coping strategies, 452
- Physical dependence, 315
- Physical health, psychological stressors and, 428–430
- Physiological arousal** *A general level of activation reflected in several physiological systems*, 332–333
- Physiological factors, motivation and, 329
- Physiological motives, 355
- Physiological psychology, 4
- Physiological responses, emotion and, 358
- Piaget, Jean, 376 cognitive development theory of, 382–386
- Pineal gland, 305
- Pinna** *The crumpled part of the outer ear that collects sound waves*, 100
- Pitch** *How high or low a tone sounds; pitch depends on the frequency of a sound wave*, 100
- Pituitary gland, 81–82
- Placebo** *A physical or psychological treatment that contains no active ingredient but produces an effect because the person receiving it believes it will*, 38

- Placebo effect, 37–38
 drug effects and expectations, 315–316
- Place cells, 166
- Placenta, 378
- Place theory** *A theory of hearing that states that hair cells at a particular place on the basilar membrane respond most to a particular frequency of sound*, 102
- Plasticity, central nervous system, 74–76
- Plateau phase of sexual response cycle, 343–344, 346
- Plato, 11
- Play therapy, 542
- Pleasure principle** *The operating principle of the id, which guides people toward whatever feels good*, 458
- Polygraphs, 363
- Ponzo illusion, 124
- Pop psychologists, 31
- Popularity, peer friendships and, 401–402
- Popular music, subliminal messages in, 298
- Pornography, sexual aggression and, 611
- Position Analysis Questionnaire (PAQ), 630
- Positive correlation, 33–34
- Positive psychology** *A field of research that focuses on people's positive experiences and characteristics, such as happiness, optimism, and resilience*, 4, 23, 476
optimism, and resilience, achievement and well-being, 353–354
- Positive punishment, 158
- Positive regard, 474. *See also* Unconditional positive regard
- Positive reinforcement** *Presenting a positive reinforcer (reward) after a desired response*, 151, 161, 547–548
- Positive reinforcers** *Stimuli that strengthen a response if they follow that response*, 150–152
- Positive symptoms, 520
- Positron emission tomography. *See* PET scans
- Postconventional level** *Moral reasoning that reflects moral judgments based on personal standards or universal principles of justice, equality, and respect for human life*, 412–413
- Posthypnotic amnesia, 310
- Posthypnotic suggestions, 310
- Posttraumatic stress disorder (PTSD)** *A pattern of adverse reactions following a traumatic event, commonly involving reexperiencing the event through nightmares or vivid memories*, 435–436
learned helplessness and, 164
- Postsynaptic potential, 55
- PQ4R method of studying, 212
- Practical intelligence, 277–279
- Praxis, 684
- Preconscious level** *The level of consciousness at which reside mental events that are not currently conscious but can become conscious at will*, 294
- Preconventional level** *Moral reasoning that is not based on the conventions or rules that guide social interactions in a society*, 412
- Predictability of stimuli, 147
- Predictability of stressors, 438
- Predispositions, 377
- Preferred frequencies, 102
- Prefrontal cortex, 66
- Prefrontal lobotomy, 563
- Pregnancy, rates of in teenagers, 409
- Prejudice** *A positive or negative attitude toward people in certain groups*, 588
 elimination of, 591
 fighting, 591
 reducing, 590–591
 theories of, 31, 589–590
- Premack, David and Ann, 251
- Premorbid adjustment, 518–519
- Prenatal development, 377–378
 stages of, 378
- Prenatal risks, 378–379
- Preoperational period** *According to Piaget, the second period of cognitive development, during which children begin to understand, create, and use symbols that represent things that are not present*, 384–385
- Presence of others, effect of on prosocial behavior, 613
- Pretreatment orientation programs, 561
- Primacy effect** *A characteristic of memory in which recall is particularly good for the first two or three items in a list*, 190
- Primary auditory cortex, 102
- Primary drives** *Drives that arise from basic biological needs*, 332
 incentives and, 333
- Primary mental abilities (PMA), study of cognitive changes across the life span, 282–284
- Primary progressive aphasia (PPA), 683
- Primary reinforcers** *Events or stimuli that satisfy psychological needs basic to survival*, 154
- Primates
 attachment formation by, 394–395
 use of language by, 251–252
- Priming, 181, 295–296
- Principles of perceptual grouping, 118–119
- Principles of perceptual organization
 figure and ground, 117–118
 grouping, 118–119
- Prisoner's dilemma game** *A social dilemma scenario in which mutual cooperation guarantees the best mutual outcome*, 617
- Private acceptance, 599
- Proactive inhibition** *A cause of forgetting whereby previously learned information interferes with the ability to remember new information*, 201
- Probability, decision making biases and, 241–242
- Problem-focused coping methods, 438–439
- Problem solving, 237
 building skills for, 236–237
 confirmation bias, 236
 creative thinking, 239–240
 functional fixedness, 235
 group processes in, 243–244
 ignoring negative evidence, 235
 mental sets, 234–235
 multiple hypotheses, 234
 obstacles to, 233–234
 strategies for, 231–233
 use of computers for, 237–239
- Procedural memory (procedural knowledge)** *A type of memory containing information about how to do things*, 181
- Processing levels, memory model, 181–182
- Processing perceptions, 125–126, 127–128
 bottom-up, 126
 culture and experience, 129
 top-down, 126–127
- Processing speed
 measurement of on WISC, 262
 measuring changes in across the life span, 283
 relationship of to intellectual abilities, 276–277
- Products of intelligence, 276
- Progesterational hormones (progesterins)** *Feminine hormones that circulate in the bloodstream*, 346
- Progesterone, 346
- Progressive relaxation training, 546
- Project Head Start, 271–272
- Projective personality measures** *Tests made up of relatively unstructured stimuli in which responses are seen as reflecting the individual's unconscious needs, fantasies, conflicts, thought patterns, and other aspects of personality*, 481
- Proposition** *A mental representation that expresses a relationship between concepts*, 224
- Proprioception** *The sensory processes that tell us about the location of our body parts and what each is doing*, 67, 113
- Proprioceptors** *Neural receptors that provide information about movement and body position*, 113
- Prosocial behavior (helping behavior)** *Any act that is intended to benefit another person*, 611–616
- Prosopagnosia, 680
- Protected classes, 638
- Prototype** *A member of a natural concept that possesses all or most of its characteristic features*, 224
- Proximity, 118
 attraction and, 593
- Psyche, 495
- Psychedelic drugs, 320–322
- Psychiatric nurses, 540
- Psychiatrists** *Medical doctors who have completed special training in the treatment of mental disorders*, 540
- Psychic determinism, 457
- Psychoactive drugs** *Chemical substances that act on the brain to create psychological effects*, 312–314
 activity of on neurotransmitters, 570
 antidepressants, 565–566
 antipsychotics, 564–565
 anti-seizure medications, 566
 CNS depressant drugs, 316–318
 CNS stimulating drugs, 318–320
 diversity and reactions to, 568
 hallucinogenic drugs, 320–322
 heroin and cocaine use disorders, 532
 lithium, 566
 major classes of, 322–323
 opiates, 320
 psychotherapy and, 568–570
 treating psychological disorders using, 567
 treatment of psychological disorders with, 564–567
 varying effects of, 314–316
- Psychoanalysis** *A method of psychotherapy that seeks to help clients gain insight into and work through unconscious thoughts and emotions presumed to cause psychological problems*, 13, 541–542
 contemporary variations on, 542–543
- Psychoanalytic theory** *Freud's view that human behavior and personality are determined largely by psychological factors, many of which are unconscious*, 457
- Psychobiological models, impact of stress, 436–437
- Psychodynamic approach** *A view developed by Freud that emphasizes the interplay of unconscious mental processes in determining human thought, feelings, and behavior*, 17, 457, 495
 evaluation of, 462–463
 non-Freudian approaches, 460–462
- Psychodynamic conflicts, 458
- Psychological dependence, 315
- Psychological disorders
 annual incidence of in the U.S., 491
 biological aspects of psychology and treatment of, 570
 biological factors, 494–495
 classifying, 498
 DSM-5 classifications of, 499–500
 legal criteria, 533
 psychoactive medications used for treating, 567
 stress and, 435–436
- Psychological experience, 90
- Psychological factors
 anxiety disorders, 506–507

- depressive and bipolar disorders, 517–518
schizophrenia, 522
- Psychological model** *A view in which mental disorder is seen as arising from psychological processes*, 495
- Psychological research
methods and behavior genetics, 41–43
methods of, 39
- Psychological stressors, 429–430
- Psychological tests, 630
- Psychological treatment, approaches to, 553–554
- Psychologists** *Among therapists, those with advanced training in clinical or counseling psychology*, 540
ethical guidelines for, 45–46
typical activities and work settings for, 9
- Psychology** *The science of behavior and mental processes*, 3. *See also* specific approaches to
analytic, 461
approaches to the science of, 15–16, 20
behavioral approach to, 17–18
biological approach to, 16
biological aspects and the treatment of psychological disorders, 570
chemistry of, 77–80
cognitive approach to, 18
contemporary, 14–15
developmental, 375
development of, 15
evolutionary approach to, 16–17
health-care, 427–428
history of, 11–15
human diversity and, 20
humanistic approach to, 18–19, 473–474
impact of sociocultural diversity on, 20–23
linkages within and beyond, 9–10
psychodynamic approach to, 17
research methods in, 31–43
subfields of, 4–8
- Psychometric approach** *A way of studying intelligence that emphasizes analysis of the products of intelligence, especially scores on intelligence tests*, 275–276
- Psychometrics, 629
- Psychometrics** *The scientific study and measurement of knowledge, abilities, attitudes, personality, and other psychological characteristics*, 275
- Psychoneuroimmunology** *The field that examines the interaction of psychological and physiological processes affecting the body's ability to defend itself against disease*, 445
- Psychopathology** *Patterns of thinking and behaving that are maladaptive, disruptive, or uncomfortable for the affected person or for others*, 491
explaining, 497–498
- Psychopaths, 525
- Psychopharmacology** *The study of psychoactive drugs and their effects*, 313
- Psychophysics, 12, 90
- Psychosexual development** *Periods of personality development in which, according to Freud, internal and external conflicts focus on particular issues*, 458–459
- Psychosis, 518
- Psychosocial development, Erikson's stages of, 399
- Psychosocial intellectual disability** *Cases of mild cognitive disability for which there is no obvious genetic or environmental cause*, 286
- Psychosocial rehabilitation, 571
- Psychosurgery** *Surgical procedures that destroy tissue in small regions of the brain in an effort to treat psychological disorders*, 563, 674–675
- Psychotherapy** *The treatment of psychological disorders through talking and other psychological methods*, 539
analysis of the effects of, 555
- evaluation of, 554–560
sociocultural factors in, 560–561
- Psychotic, 518
- Psychotomimetics, 320–322
- Puberty** *The condition of being able, for the first time, to reproduce*, 346, 408
- Public conformity, 599
- Punishment** *The presentation of an aversive stimulus or the removal of a pleasant one following some behavior*, 158–159, 549
aggression and, 608
guidelines for, 160
reinforcement and, 161
- Pupil** *An opening in the eye just behind the cornea through which light passes*, 93
- Puzzle box, 150–151
- Pyramidal motor system, role of in emotions, 359
- Pyridoxine, 67
- Pyszcynki, Tom, 578–579
- Q**
- Quantitative psychologists** *Psychologists who develop and use statistical tools to analyze research data*, 8
- Quantitative psychology, 8
- Quantitative reasoning, measurement of on Stanford-Binet test, 261
- R**
- Racism, aversive, 591–592
- Rahe, Richard, 430
- Random assignment, 37
- Randomizing** *Assigning participants in an experiment to various groups through a random process to ensure that random variables are evenly distributed among the groups*, 37
- Random sampling** *The process of selecting a group of research participants from a population whose members all had an equal chance of being chosen*, 40
- Random variable** *In an experiment, a confound in which uncontrolled or uncontrollable factors affect the dependent variable, along with or instead of the independent variable*, 37
- Rare cases, learning from, 33
- Rational-emotive behavior therapy (REBT)** *A treatment designed to identify and change illogical, self-defeating thoughts that lead to anxiety and other symptoms of disorder*, 550–551
- Reaction time** *The time between the presentation of a stimulus and an overt response to it*, 221
- Read, J. Don, 298
- Readiness, stages of for changing health behaviors, 450
- Reality
perceptions of, 474
social, 599
- Reality principle** *The operating principles of the ego, which takes into account the constraints of the social world*, 458
- Reasoning** *The process by which people generate and evaluate arguments and reach conclusions about them*, 228
- Recall** *Retrieving information stored in memory without much help from retrieval cues*, 179–180
- Recency effect** *A characteristic of memory in recall is particularly good for the last few items in a list*, 190
- Receptive aphasia, 684
- Receptors** *Sites on the surface of a cell that allow only one type of neurotransmitter to fit into them, triggering a chemical response that may lead to an action potential*, 54–55, 56
- Reciprocal determinism, 471–472
- Reciprocal teaching, 173
- Reciprocity, 598
- Recognition** *Retrieving information stored in memory with the help of retrieval cues*, 180
- Recognizing perceptions, 125–126
- Reconditioning** *The relearning of a conditioned response following extinction*, 145
- Reconsolidation, 209
- Recruitment
legal issues in, 638
process for, 636–637
- Reduced clarity, 121
- Redundancy, 128
- Reference groups** *Categories of people with whom individuals compare themselves*, 578
- Reflection, 544
- Reflexes** *Involuntary, unlearned feedback systems directed by the spinal cord, creating swift, automatic, movements in response to external stimuli*, 58, 381
- Refractory period** *A short rest period between action potentials*, 53
- Refractory period of sexual response cycle, 346
- Reinforcement schedules** *In operant conditioning, rules that determine how and when certain responses will be reinforced*, 155–156
- Reinforcement sensitivity theory, 467
- Reinforcement** *The process through which a particular response is made more likely to recur*, 152
delay and size of, 155
punishment and, 161
- Reinforcer** *A stimulus event that increases the probability that the response immediately preceding it will occur again*, 150–151
psychology of, 157–158
- Rejected children, 401
- Rejecting-neglecting parents** *Parents who invest as little time, money, and effort in their children as possible*, 400
- Relatedness needs, 355, 643
- Relationship-motivated leaders** *Leaders who provide loose supervision, ask for group members' ideas, and are generally concerned with subordinates' feelings*, 619
- Relative deprivation, 578, 646
- Relative size, 120
- Relearning method** *A method for measuring forgetting*, 200
- Reliability** *The degree to which test results or other research evidence occurs repeatedly*, 30, 263
intelligence tests, 264
- REM behavior disorder** *A sleep disorder in which the decreased muscle tone normally seen in REM sleep does not appear, thus allowing dreams to be acted out*, 303
- REM (rapid eye movement) sleep** *The stage of sleep during which muscle tone decreases dramatically but the EEG resembles that of someone who is awake*, 300–301
- Repetitive strain injuries, 652
- Repetitive transcranial magnetic stimulation (rTMS), 564
- Replication of results, 44
- Representativeness heuristic** *A mental shortcut that involves judging whether something belongs in a given class on the basis of its similarity to other members of that class*, 230
- Representative sampling** *A process for selecting research participants whose characteristics fairly reflect the characteristics of the population from which they were drawn*, 40
- Repressed memory** *A painful memory that is said to be kept out of consciousness by psychological processes*, 202
dissociative identity disorder and, 511
- Research, 11

- critical thinking and, 29–30
 goals of, 31
 selecting human participants for, 40
 social impact of, 45
 statistical analysis of, 43–45
 theories and, 30–31
Research Domain Criteria (RDoC), 500–501
Research participants
 ethical guidelines for psychologists, 45–46
 expectations of, 37–38
 selection of, 40
Resilience *A quality allowing children to develop normally in spite of severe environmental risk factors*, 406–407
Resiliency training, 165
Resolution phase of sexual response cycle, 346
Response bias (response criterion) *The internal rule a person uses to decide whether or not to report a stimulus*, 91
Reticular activating system (RAS), 676–677
Reticular formation *A network of cells and fibers threaded throughout the hindbrain and midbrain that gives alertness and arousal to the rest of the brain*, 59, 676–677
Retinal disparity *A depth cue based on the difference between the retinal images received by each eye*, 121
Retina *The surface at the back of the eye onto which the lens focuses light rays*, 94
Retirement, 418–419
Retrieval cues *Stimuli that allow or help people to recall information*, 190, 202
Retrieval *The process of digging information stored in memory*, 179–180
 Retrieving incomplete knowledge, 193–194
 Retrieving memories, 209
 context and state dependence, 191–192
 failures of and forgetting, 202
 retrieval cues and encoding specificity, 190–191
 semantic memory retrieval, 192
Retroactive inhibition *A cause of forgetting whereby new information placed in memory interferes with the ability to recall information already in memory*, 201
Retrograde amnesia *A loss of memory for events that occurred prior to a brain injury*, 208–210
Reversibility, 385
Reward, hidden cost of, 334
Right temporal cortex, localization-related epilepsy in, 115–116
Risk
 prenatal, 378–379
 resilience and, 406–407
Risk-taking, prevalence among adolescents, 408
Risky decisions, 240–242
Rituals, obsessive-compulsive disorder and, 505
Road rage, 431
Rods *Photoreceptors in the retina that allow sight even in dim light but that cannot distinguish colors*, 94–95
Roediger, Henry, 195–196
Rogers, Carl, 19, 474–475, 543
Role theory, 310
Romantic love, 595–596
 recognition of in fMRI brain images, 70–71
Rooting reflex, 381
Rorschach Inkblot Test, 481
Rosenthal, Robert, 38
Rotating shift work, 653
Rotter, Julian, 471
Rousseau, Jean-Jacques, 375
Rules for talking, 553
Rules in language, 245
 language acquisition and, 248–249
- Rules of thumb, 229–231
Ruminative thinking, 434
 depressive disorders and, 518
- S**
- Sacks, Oliver**, 32
Safety, 355
s A group of special abilities that Charles Spearman saw as accompanying general intelligence (g), 276
Salary, job satisfaction and, 646
Sampling *The process of selecting participants who are members of the population that the researcher wishes to study*, 40
Satiation *The satisfaction of a need such as hunger*, 336
 biological signals for, 336–337
Satiety *The condition of no longer wanting to eat*, 336
Saturated color, 96
Savage-Rumbaugh, Sue, 251
Savings, 200
Schachter, Stanley, 364–365
Schachter-Singer theory of emotion, 364–365
Schaefer, James, 34
Schale, K. Warner, 282
Schedules, extinction and, 157
Schema-plus correlation, 580
Schemas in social psychology *Generalizations about categories of objects, places events, and people*, 580–582
 events, and people, stereotypes and, 590
Schemas *Mental representations of what we know and expect about the world*, 127, 196–197, 225, 382
 effect of on recall, 197
Schizoaffective disorder, 520
Schizophrenia *A pattern of severely disturbed thinking, emotion perception, and behavior that constitutes one of the most serious and disabling of all mental disorders*
 association of dopamine with, 78
 causes of, 520–523
 family and twin studies of, 42
 spectrum of, 520
 symptoms of, 519–520
 perception, and behavior that constitutes one of the most serious and disabling of all mental disorders, 518–519
Schizophreniform disorder, 520
Schizotypal personality disorder, 524
School psychologists *Psychologists who test IQs, diagnose students' academic problems, and set up programs to improve students' achievement*, 7
School psychology, 6–7
Schumacher, Ralf, 208
Scientific research
 critical thinking and, 29–30
 goals of, 31
 social impact of, 45
 statistical analysis of, 43–45
 theories and, 30–31
Scratching, 111
Scripts *Mental representations of familiar sequences of activity*, 225–226
Seasonal affective disorder (SAD), 516–517
Seattle Longitudinal Study of Cognitive Aging, 282–284
Secondary drives *Stimuli that take on the motivational properties of primary drives through learning*, 332
 incentives and, 333
Secondary reinforcement, 154
Secondary reinforcers *Reward that people or animals learn to like*, 154
Secondary traits, 464
Secure attachment, 396
- Seeing**
 aspects of the sensory system, 99
 color, 96–97
 color blindness, 98
 converting light into images, 94–96
 focusing light, 93–94
 light, 92–93
 newborn vision, 380
 perception of location and distance, 119–121
 theories of color vision, 97–98
Seizures, malfunction of GABA systems and, 79
Selecting research participants, 40
Selection processes for employees, 637–638
 legal issues in, 638
Selective attention *The process of focusing mental resources on only part of the stimulus field*, 132, 185
Selective breeding, 41
Selective serotonin reuptake inhibitors (SSRIs), 565, 570
Self
 identity and development of, 410–411
 Roger's theory of, 474–475
Self-actualization *The reaching of one's full potential; the complete realization of a person's talents, faculties, and abilities*, 355, 473–474
Self-concept *The way one thinks about oneself*, 474–475, 577
Self-efficacy *According to Bandura, the learned expectation of success in given situations*, 471–472
 health beliefs and, 450
Self-esteem *The evaluations people make about their worth as human beings*, 577
 adolescents and, 408
 terror management theory and, 578–579
Self-fulfilling prophecy *A process in which an initial impression causes us to bring out behavior in another that confirms the impression*, 582
Self-help recordings, 297
Self-hypnosis, 312
Self-regulation *The ability to control one's emotions and behavior*, 402
Self-regulatory plans, 472
Self-reports, 480
Self-serving bias *The tendency to attribute one's successes to internal characteristics while blaming one's failures on external causes*, 584
Selye, Hans, 432
Semantic encoding, 188
Semantic memory *Memory for generalized knowledge about the world*, 179, 180–181
 changes in late adulthood, 415
 networks of, 192–193
 retrieval from, 192
Semantics *Rules governing the meaning of words and sentences*, 245
Semicircular canals of the ear, 114
Sensations *Raw information from the senses*, 87
 encoding, 88–90
 perceptions and, 116–117
Sense *A system that translates data from outside the nervous system into neural activity*, 87
Sense of balance, 114
Sense of equilibrium (vestibular sense) *The proprioceptive sense that provides information about the position of the head and its movements*, 113–114
Senses. See also Hearing; Seeing; Smell; Taste
 interaction of, 103–104
Sensing body position, 113–114
Sensitivity *The ability to detect a stimulus*, 91
Sensitization, 142
Sensorimotor period *According to Piaget, the first period of cognitive development, when the infant's mental*

- activity is confined to sensory perception and motor skills, 384, 386*
- Sensory adaptation** *Decreasing responsiveness to an unchanging stimulus, 88*
- Sensory cortex** *The parts of the cerebral cortex that receive stimulus information from the senses, 62–64*
- Sensory memory** *A type of memory that is very brief but lasts long enough to connect one impression to the next, 183, 185*
- Sensory neurons** *Cells in the nervous system that provide information to the brain about the environment, 57 touch, 109–110*
- Sensory receptors, 88
- Sensory registers** *Memory systems that briefly hold incoming information, 185*
- Sensory system elements, 89
- Separation anxiety disorder, 529
- Sequencing of organizational training, 640–641
- Serotonin, 78
association of abnormality of and illness anxiety disorder, 509
hunger suppression and, 337
- Set point, 337
- Sex hormones** *Chemicals in the blood that organize and motivate sexual behavior, 81, 346*
- activation of in adolescents, 408
influence of on sexual orientation, 348
- Sex offenders, castration of, 346
- Sex roles** *Patterns of work, appearance, and behavior that a society associates with being male or female, 404–406. See also Gender roles*
- Sexual activity, adolescents, 409
- Sexual aggression, pornography and, 611
- Sexual arousal** *Physiological arousal that arises from sexual contact or erotic thoughts, 344, 346–347*
- Sexual behavior
biology of, 343–344, 346
Kinsey's survey of, 344–345
- Sexuality, social and cultural factors in, 346–347
- Sexual orientation, 347
factors shaping, 348–350
- Sexual relationships, ethical considerations, 561
- Sexual response cycle** *The pattern of arousal before, during, and after sexual activity, 343–344, 346*
- Sexual scripts, 343
- Shadow and light, 121
- Shape constancy, 123
- Shaping** *The reinforcement of responses that come successively closer to some desired response, 154*
- Shapiro, Francine, 27
experimental investigation of EMDR by, 35–36
- Shared decision making, 244
- Sherif, Muzafer, 598–599
- Shift work, 653
- Short-term memory (STM)** *A stage of memory in which information normally lasts less than twenty seconds; a component of working memory, 183*
- comparison with long-term memory, 189–190
decay and, 201
duration of, 187–188
encoding, 186
storage capacity of, 186–187
working memory and, 186
- Short-term psychodynamic psychotherapy, 542
- Short-wavelength cones, 97
- Shuttle box, 153
- Signal detection theory** *A mathematical model of what determines a person's report of a near-threshold stimulus, 90–91*
- Signals, 146
- Significant events, signaling of, 146–148
- Similarity, 118
attraction and, 593–594
- Simplicity, 31, 118
- Simultanagnosia, 680
- Singer, Jerome, 364
- Situational factors, defining abnormality using, 493
- Situational tests, 480
- Situation judgment tests (SJTIs), 630
- Size constancy, 123
- Size illusions, 123–124
- Size of the majority, conformance and, 600
- Skill learning, 173
- Skills, industrial and organization assessment of, 629
- Skinner, B.F., 14, 151, 545–546
- Skinner box, 151
- Sleep, 307
reasons for, 303–307
stages of, 299–301 (*See also NREM sleep; REM sleep*)
- Sleep apnea** *A sleep disorder in which a person briefly but repeatedly stops breathing during the night, 302*
- Sleep deprivation** *A condition in which people do not get enough sleep; it may result in reduced cognitive abilities, inattention, and increased risk of accidents, 306–307*
- Sleep disorders, 301–303, 307
- Sleeping pills, 317
- Sleep terror disorder (night terrors)** *The occurrence of horrific dream images during N3 sleep, followed by a rapid awakening and a state of intense fear, 303*
- Sleep-wake rhythms, 303–305
- Sleepwalking** *A phenomenon that starts primarily in NREM sleep, especially in stage N3, and involves walking while asleep, 302–303*
- Sleepy driving, 306
- Slow-wave sleep, 300
- Small molecules, 78
- Smell, 105–107
absolute threshold for, 90
aspects of the sensory system, 108
interaction of with taste, 104–105
newborn sense of, 381
- Smoking, prenatal exposure to, 379
- Social anxiety disorder (social phobia)** *Strong, irrational fears related to social situations, 504*
- Social categories, 589
- Social cognition** *Mental processes associated with people's perceptions of and reactions to other people, 577*
- Social-cognitive approach** *The view that personality reflects learned patterns of thinking and behavior, 18, 470*
- Bandura and reciprocal determinism, 471–472
evaluating, 473
Mischel's cognitive/affective theory, 472–473
Rotter's expectancy theory, 471
- Social comparison** *Using other people as a basis of comparison for evaluating oneself, 577–578*
- Social dependability, 443
- Social development
attachment and, 392–393
infancy and childhood, 406
- Social dilemmas** *Situations in which actions that produce rewards for one individual will produce negative consequences for all if they are adopted by everyone, 616–617*
- Social discrimination** *Differential treatment of people in certain groups; the behavioral component of prejudice, 588*
- Social facilitation** *A phenomenon in which the presence of others improves a person's performance, 618*
- Social factors
depressive and bipolar disorders, 517–518
- expression of emotion and, 367–369
gender roles, 405–406
motivation and, 329
sexuality and, 346–347
- Social identity** *The beliefs we hold about the groups to which we belong, 580*
- obedience and, 605
- Social impact of research, 45
- Social influence, 596–597
conformity and compliance, 598–602
factors affecting, 606
norms, 597–598
types of, 606
- Social interference** *A reduction in performance due to the presence of other people, 618*
- Socialization** *The process by which parents, teachers, and others teach children the skills and social norms necessary to be well-functioning members of society, 169, 399*
- gender role development and, 404–406
- Social learning, 167–171
- Social loafing, 244
- Social loafing** *Exerting less effort when performing a group task than when performing the same task alone, 619*
- Social neuroscience** *A specialty that focuses on the influence of social processes on biological processes and on the influence of biological processes on social psychological phenomenon, 620*
- Social norms** *Learned, socially biased rules that prescribe what people should or should not do in various situations, 597–598*
- Social perception** *The processes through which people interpret information about others, draw inferences about them, and develop mental representations of them, 580–581*
- biases in, 584
- Social phobia** *Strong, irrational fears related to social situations, 504*
- Social psychologists** *Psychologists who study how people influence one another's behavior and mental processes, individually and in groups, 7*
- Social psychology** *The subfield of psychology that explores the effects of the social world on the behavior and mental processes of individuals and groups, 7, 577*
- biological psychology and, 620
- Social Readjustment Rating Scale (SRRS), 430–431
- Social reality, conformance and, 599
- Social referencing, 369, 392–393
- Social skills, 402
- Social skills training, 547
- Social support** *The friends and social contacts on whom one can depend for help and support, 440–441*
- alcohol use and, 531
emotional coping strategy and, 452
- Sociocultural diversity, impact of on psychology, 20–23
- Sociocultural experience, food selection and, 338–339
- Sociocultural factors, hyperactivity and, 528–529
- Sociocultural factors influencing abnormality** *Characteristics or conditions that can influence the appearance and form of maladaptive behavior, 496–497*
- alcohol use disorder, 530–531
anxiety disorders and, 504
schizophrenia, 522
somatic symptom disorders, 509
suicide and, 513–514
- Sociocultural factors** *Social identity and other background factors, such as gender ethnicity, social class, and culture*
- aggression and, 608
- psychotherapy and, 560–561

- temperamental qualities and, 393–394
ethnicity, social class, and culture, 21
- Sociocultural perspective** *Explaining mental disorders in ways that emphasize the role of factors such as gender and age, physical situations, cultural values and expectations, and historical era*, 496
- Socioeconomic status
 cognitive development and, 390–392
 correlation of with IQ scores, 269–270
- Sociopath, 525
- Socrates, 11
- Solomon, Sheldon, 578–579
- Solving problems, 237. *See also* Problem solving
- Somatic nervous system (SNS)** *The subsystem of the peripheral nervous system that transmits information from the senses to the central nervous system and carries signals from the central nervous system to the muscles*, 56–57
- Somatic symptom disorders** *Psychological problems in which a person shows the symptoms of a physical disorder for which there is no physical cause*, 508–509
- Somatosensory cortex, 64
- Somatosensory systems, 109
- Sound** *A repetitive fluctuation in the pressure of a medium such as air*
 encoding, 102–103
 waves and waveforms, 100
- Sources of motivation, 329–330
- Spatial intelligence, 280
- Spearman, Charles, 276
- Special therapeutic relationship, 539. *See also* Therapeutic relationship
- Specific energy doctrine** *The discovery that stimulation of a particular sensory nerve provides codes for that sense, no matter how the stimulation takes place*, 89, 115–116
- Specific phobias** *Phobias that involve fear and avoidance of specific stimuli and situations such as heights, blood, and certain animals*, 504
- Speech
 learning to speak, 247–248
 understanding, 246–247
- Speed, 318
- Speed-accuracy trade-off, 221
- Spinal cord** *The part of the central nervous system within the spinal column that relays signals from peripheral senses to the brain and conveys messages from the brain to the rest of the body*, 58
- endorphin system of, 111
 gate control theory of pain, 110–111
 repairing damage to, 74–75
- Spines, 206
- Split-brain studies, 73–74
- Spontaneous generalizations, 196
- Spontaneous recovery** *The temporary reappearance of a conditioned response after extinction*, 145
- Sports psychologists** *Psychologists who explore the relationships between athletic performance and such psychological variables as motivation and emotion*, 8
- Spreading activation** *In semantic network theories of memory, a principle that explains how information is retrieved*, 193
- Standard intelligence tests, 259–263
 evaluating, 263–266
 Standardized tests, 263
- Stanford-Binet Intelligence Scale** *A test for determining a person's intelligence quotient or IQ*, 259–260
- State-dependent memory (state-dependent learning)**
Memory that is helped or hindered by similarities or differences in a person's internal state during learning vs. recall, 192
- States of consciousness, 293–294
- State theories of hypnosis** *Theories proposing that hypnosis creates an altered state of consciousness*, 310
- Statistical reliability** *The degree to which test results or other research evidence occurs repeatedly*, 30
 defining, 263
 intelligence tests, 264
- Statistical significance** *Referring to a correlation or a difference between two groups that is larger than would be expected by chance*, 44, 556
- Statistical validity** *The degree to which evidence from a test or other research method measures what it is supposed to measure and is interpreted and used appropriately*, 30
 defining, 263–264
 intelligence tests, 264–265
- Statistics
 use of to analyze research, 43–44
 use of with critical thinking, 44–45
- Stem cells, use of to repair brain damage, 75
- Stereotypes** *False assumptions that all members of some group share the same characteristics*, 588
 theories of, 589–590
- Stereotype threat, intelligence testing and, 266–267
- Stern, William, 259
- Sternberg, Robert, 277–279, 595–596
- Stimulation, children's cognitive development and, 390–392
- Stimuli
 discriminative conditioned, 161
 judging differences between, 91–92
 learning about, 141–142
 use of in priming experiments, 295–296
- Stimulus control, 153
 therapy, 161
- Stimulus control therapy, treating insomnia with, 301
- Stimulus cues, 120–121
- Stimulus discrimination** *A process through which people learn to differentiate among similar stimuli and respond appropriately to each one*, 145–146, 153–154
- Stimulus-driven control, 132
- Stimulus generalization** *A process in which a conditioned response is triggered by stimuli similar to the original conditioned stimulus*, 145–146, 153
- Stimulus lines, measuring conformance, 599
- Stimulus-response compatibility, 221–222
- Stirrup, 100
- Storage** *The process of maintaining information in the memory system over time*, 179–180
- Storing memories, 209
 distinguishing between short- and long-term memory, 189–190
 long-term memory, 188–189
 sensory memory, 185
 short-term and working memory, 186–188
- Strains, 430
- Strange Situation, attachment formation and, 395–396
- Stream of consciousness, 13
- Street smarts, measuring, 278
- Strength of correlations, 34
- Stress inoculation training, 551
- Stress mediators, 436–437, 444–445
- Stressor-related disorders, 506
- Stressors** *Events or situations to which people must adjust*, 428–429
 measuring, 430–431
 perception of, 436–437
 predictability and control of, 438
 psychological, 429–430
- Stress reactions** *Physical and psychological responses to stressors*, 428
- Stress responses, 444–445
 cognitive influences on, 437
- Stress** *The process of adjusting to circumstances that disrupt or threaten to disrupt a person's daily functioning*, 428–429
 conflicting motives and, 356–357
 effect of on insomnia, 301
 illness and, 445–446
 immune system and, 446
 meditation and, 312
 methods for coping with, 452
 physical responses to, 431–433
 during pregnancy, 379
 process of, 429
 psychological responses to, 433–436
 steps for coping with, 451
 workplace, 654
- Stroboscopic illusion** *An illusion of motion that is created when we see slightly different images or slightly displaced lights flashed in rapid succession*, 122
- Stroke (cerebral infarct)** *A loss of blood supply to some part of the brain, resulting in brain damage that disrupts some aspect of behavior or mental processes*, 667, 670–671
 anosognosia following, 678–679
 aphasia due to, 683
- Stroop task, 134
- Structuralism, 12
- Structured interviews
 use of during personality assessment, 481
 use of for job applicants, 631
- Structures in language, 245–246
- Subconscious** *Another term that describes the mental level at which influential but normally inaccessible mental processes take place*, 295. *See also* Unconscious
- Subcultures, 22
- Subjective well-being** *A cognitive judgment of satisfaction with life, the frequent experiencing of positive moods and emotions, and the relatively infrequent experiencing of unpleasant moods and emotions*, 353–354
- Subjectivity of emotions, 357–358
- Subliminal messages
 behavior changes and, 296–297
 popular music and, 298
- Substance abuse counselors, 540
- Substance-related disorders** *Problems involving the use of psychoactive drugs for months or years in ways that harm the user or others*, 530–532
- Substance use disorder** *The use of psychoactive drugs in ways that deviate from cultural norms and cause serious problems for the user*, 314–315
- Subtractive color mixing, 96
- Success, achievement and, 353
- Successive approximations, 154
- Sucking reflex, 381
- Sudden infant death syndrome (SIDS)** *A disorder in which a sleeping baby stops breathing, does not awaken, and dies*, 302
- Suicide
 copycat, 597
 depression and, 513–514
- Sulci, 62
- Sullivan, Harry Stack, 461
- Superego** *According to Freud, the component of personality that tells people what they should and should not do*, 458
- Supertasters, 108
- Suprachiasmatic nuclei, 60–61
 circadian rhythms and, 304–305

- Surface structure** *The order in which words are arranged in sentences,* 246
- Surveys** *A research method that involves giving people questionnaires or special interviews designed to obtain descriptions of their attitudes, beliefs opinions, and intentions*
- designing, 33
 - flawed, 34
 - limitations of, 33
 - validity of, 33
 - opinions, and intentions,* 32–33, 39
- Symbolic reasoning, computer logic and, 238
- Symbols**
- in language, 245
 - use by children, 384–385
- Sympathetic nervous system** *The subsystem of the autonomic nervous system that readies the body for vigorous activity,* 57, 361
- Sympatho-adreno-medullary (SAM) system, 446–447
- stress responses in, 432–433
- Synapses** *The tiny gaps between neurons across which they communicate,* 54–55
- Synaptic gap, 54
- Synchrony, 118
- Syndromes** *A pattern of symptoms associated with a specific disorder,* 673
- Synesthesia, 103–104
- Syntax** *The set of rules that govern the formation of phrases and sentences in a language,* 245
- Systematic desensitization therapy** *A behavioral method for treating anxiety in which clients visualize a graduated series of anxiety-provoking stimuli while remaining relaxed,* 149–150, 546–547
- Szasz, Thomas, 501
- T**
- Tabula rasa,* 12, 375
- Taijin kyofusho,* 504
- Talking cure, 541–542
- Tardive dyskinesia, 564–565, 570
- Target organs, 81
- emotional response and, 360
- Task Force on Promotion and Dissemination of Psychological Procedures, 557–560
- Task-motivated leaders** *Leaders who provide close supervision, lead by giving directions, and generally discourage group discussion,* 619
- Task performance, 633
- Taste, 107–108
- absolute threshold for, 90
 - aspects of the sensory system, 108
 - conditioned aversion, 148
 - interaction of with smell, 104–105
 - newborn sense of, 381
- Taste buds, 107
- Taste perception** *The sense that detects chemicals in solution that come into contact with receptors inside the mouth; also called gustatory perception,* 104
- Taylor, Shelley, 442
- T-cells, 446
- Teenagers. *See* Adolescents
- Telegraphic sentences, 248
- Telehealth, 562
- Temperament** *An individual's basic, natural disposition that is evident from infancy,* 393
- categories of, 479
 - differences in, 468
- Temperature, touch and, 109–110
- Temporal lobe, 62
- Tend and befriend, 442
- Teratogens** *Harmful substances, such as alcohol and other drugs, that can cause birth defects,* 379
- Terman, Lewis, 259
- Terman Life Cycle Study, 443–444
- Terminal drop** *A sharp decline in mental functioning that tends to occur in late adulthood, a few months or years before death,* 419
- Terrace, Herbert, 251
- Terror management theory, 578–579
- Test anxiety, 266–267
- Test** *A systematic procedure for observing behavior in a standard situation and describing it with the help of a numerical scale or a category system,* 263
- Testing effects, 282
- Testosterone, 81, 346
- aggression and, 607–608
- Textbooks, PQ4R method for reading, 212
- Thalamus** *A forebrain structure that relays signals from most sense organs to higher levels in the brain and plays an important role in processing and making sense out of this information,* 60
- role of in schizophrenia, 521
- Thematic Apperception Test, 350, 481
- Theoretical criterion, 632–633
- Theories, 539. *See also* specific theories
- arousal, 332–333
 - attachment, 394, 461–462
 - biological trait, 466–469
 - Cannon-Bard, 363–364
 - decay, 200–201
 - dissociation, 311
 - drive reduction, 331–332
 - excitation transfer, 365
 - humanistic, 473–476
 - incentive, 333
 - object relations, 461
 - opponent-process, 97–98
 - place, 102
 - psychoanalytic, 457
 - role of, 30–31
 - signal detection, 90–91
 - social-cognitive, 470–473
 - trichromatic, 97
 - volley, 103
- Theory** *An integrated set of propositions that can be used to account for, predict, and even suggest ways of controlling certain phenomena,* 30
- Therapeutic punishment, 159–160
- Therapeutic relationship, 539
- rules and rights in, 561–562
- Therapists, 539. *See also* specific types
- Thinking strategies
- formal reasoning, 228–229
 - informal reasoning, 229–231
- Thinking** *The manipulation of mental representations,* 220–221
- Thorndike, Edward L., 150–151, 628
- Thought
- basic functions of, 219–222
 - blocking, 519
 - broadcasting, 519
 - ingredients of, 227
 - insertion, 519
 - mental representations, 223–227
 - withdrawal, 519
- Thought processes, emotional alteration of, 358
- Three-dimensional perception of distance, 120–121
- Timbre** *The quality of a sound that identifies it,* 100
- Timing of stimuli, 146–147
- Tip-of-the-tongue phenomenon, 194
- Titchener, Edward, 12
- Token economy program** *A system for improving the behavior of clients in institutions by rewarding desirable behaviors with tokens that can be exchanged for various rewards,* 548
- Tolerance, 150
- Top-down processing** *Aspects of recognition guided by higher-level cognitive processes and by psychological factors such as expectations,* 126–127, 474
- understanding speech, 246–247
- Total safety culture, 654
- Touch
- absolute threshold for, 90
 - adapting to stimuli, 109
 - encoding, 109
 - sensing temperature, 109–110
- Toxic substances, prenatal exposure to, 378–379
- Trainee-learning criteria, 642
- Training employees, 638
- assessing needs, 639
 - designing programs for, 639–641
 - evaluating programs for, 641–642
- Training-level criteria, 642
- Training needs assessment, 639
- Trait approach** *A perspective on personality that views it as the combination of stable characteristics that people display over time and across situations,* 463–464
- criticisms of, 472–473
 - evaluation of, 469–470
- Tranquilizing medications (anxiolytics)** *Medications that reduce tension and symptoms of anxiety,* 566
- Transactional leaders, 619–620
- Transcranial magnetic stimulation (TMS), 68, 72, 668–669
- use of in pain management, 111
- Transduction** *The process of converting incoming physical energy into neural activity,* 88
- Transfer-appropriate processing model of memory** *A model that suggests that memory depends on how the encoding process matches up with what is later retrieved,* 182
- Transference, 542
- Transfer of training, 639–640
- Transformational leaders, 619–620
- Trauma-related disorders, 506
- Traumatic brain injury (trauma)** *An impact on the brain caused by a blow or sudden, violent movement of the head,* 672
- Traumatic memories, repression and recovery of, 202–205
- Treatment, basic features of, 539–541
- Triarchic theory of intelligence, 277–279
- Trichromatic theory** *A theory of color vision stating that information from three types of visual elements combines to produce the sensation of color,* 97
- Tricyclic antidepressants (TCAs), 565, 570
- Trump, Donald, 331
- Tsarnaev, Tamerlan and Dzhokhar, 577
- Turnover, job dissatisfaction and, 650
- TV violence
- aggression and, 608
 - observational learning and, 169–171
- Twin studies, 42–43
- anxiety disorders, 506
 - depressive and bipolar disorders, 515–517
 - inheritability of schizophrenia, 521
 - job satisfaction, 648–649
 - personality traits, 467–469
- Two-dimensional location, 119–120
- Two-group experiment, 36
- Tympanic membrane (eardrum)** *A tightly stretched membrane in the middle ear that generates vibrations that match the sound waves striking it,* 100–101

U

Ultimate attribution error, 583

Umani, 107

Umbilical cord, 378

Unanimity, conformance and, 600

Uncertainty, decision making under, 241–242

Unchanging stimuli, 142

Unconditional positive regard *In client-centered therapy, the therapist's attitude that expresses caring for and acceptance of the client as a valued person,* 543

Unconditioned response (UCR) *The automatic, unlearned, reaction to stimulus,* 144

Unconditioned stimulus (UCS) *A stimulus that triggers a response without conditioning,* 144

Unconscious *The term used to describe a level of mental activity said by Freud to contain unacceptable sexual, aggressive, and other impulses of which an individual is unaware,* 294–295, 541–542

Freud's exploration of, 13

Undercontrolled disorders in children, 528

Undergraduate Stress Questionnaire, 430

Understanding speech, 246–247

Unhealthy eating

anorexia nervosa, 341

binge eating disorder, 342

bulimia, 341–342

obesity, 339–341

Uninvolved parents (rejecting-neglecting parents)

Parents who invest as little time, money, and effort in their children as possible, 400

Universal precautions, 652

Universal smile, 368

Unrealistic optimism, 584

Unstructured interviews, 631

Unusual intelligence

giftedness, 284–285

intellectual disability, 285–286

Uppers, 318

Upward social comparison, 578

Utility *In decision making, any subjective measure of value,* 241

V

Vagal nerve stimulation (VNS), 563

Validity *The degree to which evidence from a test or other research method measures what it is supposed to measure and is interpreted and used appropriately,* 30, 263–264

DSM-5 and, 500

intelligence tests, 264–265

Values, 472

internalization of, 458

Variability in IQs, 267–268

Variable *A factor or characteristic that is manipulated or measured in research,* 30

relationships between, 33–34

Variable-interval (VI) reinforcement schedules, 156

Variable-ratio (VR) reinforcement schedules, 155–156

Variables

confounds and, 36–37

dependent, 36

independent, 36

random, 37

Vascular dementia *A form of dementia caused by multiple restrictions of the brain's blood supply,* 687

Vaughan, Norman, 229

Ventromedial hypothalamus, hunger signals from, 337–338

Verbal comprehension, measurement of on WISC, 262

Verbal intelligence tests, 260–261

Vesicles, 54

Vestibular-ocular reflexes, 114

Vestibular sacs, 114

Vestibular sense *The proprioceptive sense that provides information about the position of the head and its movements,* 113–114

Vicary, James, 296

Video games, violent behavior in children and, 169–171

Violence

adolescents and, 409–410

observational learning and, 169–171

therapist responsibilities regarding, 562

Virtual desensitization, 547

Virtual reality, active learning using, 172

Virtual reality graded exposure, 547

Vision, absolute threshold for, 90

Vision problems, 94

Visual agnosia, 666, 679–680

Visual cliff, 131, 369

Visual cortex, 65

Visual dominance, 120

Visual memory *Mental representations of stimuli as pictures,* 179

Visual processing, 295

Visual-spatial processing, measurement of on Stanford-Binet test, 262

Vokey, John R., 298

Volley theory *A theory of hearing that states that the firing rate of an acoustic nerve matches a sound wave's frequency; also called frequency matching theory,* 103

Voluntary movement initiation, 685

von Helmholtz, Hermann, 12, 97

von Meduna, Ladislaus, 563

Vulnerability theory of schizophrenia, 522–523

Vygotsky, Lev, 389–390

W

Wada, June, 678

Wada test, 678–679

Warm fibers, 109–110

Washburn, Margaret, 20

Watson, John B., 14, 376

Wavelength *The distance between peaks in a wave of light or sound,* 92

color sensations and, 96–97

Wearing, Clive, 208

Webdale, Kendra, 562

Weber's law *A law stating that the smallest detectable difference in stimulus energy (just-noticeable difference) is a constant fraction of the intensity of the stimulus,* 91

Wechsler, David, 261

Wechsler Adult Intelligence Scale (WAIS), 261, 670

Wechsler Intelligence Scale for Children (WISC), 261–262

Well-being (subjective well-being) *A cognitive judgment of satisfaction with life, the frequent experiencing of positive moods and emotions, and the relatively infrequent experiencing of unpleasant moods and emotions,* 353–354

infrequent experiencing of unpleasant moods and emotions, 353–354

Wernicke, Carl, 65

Wernicke-Geschwind model of aphasia, 684

Wernicke's aphasia *A language disorder in which there is a loss of ability to understand written or spoken language and to produce sensible speech,* 66, 683–684

Wernicke's area, 65

Wertheimer, Max, 13, 118

Whole body vibration therapy, 111

Widom, Cathy, 526–527

Williams syndrome, 286

Winehouse, Amy, 318

Wisdom, 240

Wish fulfillment theory of dreams, 308

Withdrawal syndrome, 315

Within group variations, IQ tests, 270–271

Wolpe, Joseph, 546

Womb envy, 461

Women. *See also* Gender

leadership potential of, 619–620

sexual response cycle of, 343–344, 346

Word salad, 519, 683

Work-family conflict

job satisfaction and, 646–647

shift work and, 653

Work groups *At least two people who interact with one another as they perform the same or different workplace tasks,* 654

autonomous, 654–655

leadership, 655–657

Working memory *Memory that allows us to mentally work with, or manipulate, information being held in short-term memory,* 186

measurement of on Stanford-Binet test, 262

measurement of on WISC, 262

measuring changes in across the life span, 283

Work motivation, 353

Workplace

achievement and success in, 353

use of personality tests to predict behavior in, 485

Workplace design, creativity and, 239

Work schedules

long shifts and long weeks, 653–654

rotating shift work, 653

Work team *A work group in which the members' specialized activities are coordinated and interdependent as they work toward a common goal,* 654–655

Wright, Orville, 232

Wright, Wilbur, 232

Wundt, Wilhelm, 12, 628

X

XTC, 320

Y

Yalom, Irwin, 545

Yates, Andrea, 533

Yin/yang, 494

Young, Thomas, 97

Young-Helmholtz theory of color vision, 97

Z

Zajonc, Robert, 618–619

Zero-sum game, conflict and, 618

