CHAPTER 5

PERSONALITY DEVELOPMENT ACROSS THE LIFE SPAN: CURRENT FINDINGS AND FUTURE DIRECTIONS

M. Brent Donnellan, Patrick L. Hill, and Brent W. Roberts

The study of personality development concerns the origins and stability of individual differences from infancy to old age. Key issues revolve around the kinds of questions that perennially capture human attention (Block & Block, 2006a) and generate intense debate both within the field of psychology and beyond. *How well do childhood attributes foreshadow adult characteristics? How stable are adult personality attributes? What processes account for stability and change? Are interventions designed to produce lasting personality change possible and feasible?* These issues cut across subdisciplines within psychology—including clinical, developmental, and personality psychology—and unite psychologists with fellow social scientists from disciplines such as economics (e.g., E. Ferguson, Heckman, & Corr, 2011) and sociology (e.g., Conger & Donnellan, 2007). The objective of this chapter is to provide a summary of the existing literature that seeks to answer these sorts of questions and to identify some important avenues for future study.

Our review is selective and emphasizes recent findings. Readers who desire more extensive reviews should consult one or more of the existing chapters on this topic published within the past 10 years (e.g., Caspi & Shiner, 2006; Donnellan & Robins, 2009; Roberts, Donnellan, & Hill, 2013; Roberts, Wood, & Caspi, 2008). The chapter begins by tackling the thorny issue of defining the appropriate units for developmental study and discussing the challenges inherent in taking a developmental approach to the study of personality. It then distinguishes different types of personality stability and change and reviews current findings on these topics. It concludes by discussing the mechanisms and processes that produce personality stability and change and considers the broad implications of research in personality development.

IDENTIFYING THE TARGETS OF DEVELOPMENTAL RESEARCH

Although there are clear hints of a psychological coherence in individuality across the life span (e.g., Caspi et al., 2003; Hampson & Goldberg, 2006), figuring out what to study from a developmental perspective is no easy task. This is perhaps unsurprising because personality psychologists have long debated the most appropriate ways to define and measure the units of individuality that serve as the subject of the field. These issues are even more perplexing when viewed through a developmental lens.

Indeed, a wide range of attributes distinguishes individuals of different ages from one another. For example, toddlers differ in terms of their curiosity, emotional reactions to novel stimuli, levels of self-control, and characteristic ways of handling separation from caregivers. Other individual differences like shyness and aggressiveness come into closer relief as children begin to interact with peers. In addition to these kinds of attributes, adolescents and adults differ in their characteristic ways of construing achievement contexts, their identities, and their sociopolitical ideologies. Such dimensions require cognitive skills related to self-reflection and abstract reasoning, which gradually develop during late

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childhood and adolescence. It seems as if the potential dimensions of individuality increase with age and the associated changes in the biological, cognitive, and social aspects of human development.

Fortunately, the integrative approaches to characterizing personality such as the ones proposed by McAdams and Pals (2006; see also McAdams & Olson, 2010) and Roberts and Wood (2006) provide a framework for addressing questions about the appropriate units of analysis for developmental studies. These models distinguish between different hierarchical levels of individuality ranging from core dispositions to constructs like life stories and identities that require self-reflective capabilities, aspects of cognition that seem to emerge sometime during adolescence (McAdams, 2001). Roughly speaking, these models identify three or four important kinds of individual difference constructs: dispositions, motivations, narratives, and (sometimes) abilities (Roberts & Wood, 2006).

Dispositions are the relatively enduring patterns of emotionality, self-regulation, and orientations to the social and physical environment that characterize the individual. Dispositions include what individuals automatically think, feel, and do in a given situation, and thus they reflect habituated patterns that are nonconscious rather than deliberate. The Big Five domains have proven to be an especially popular taxonomy for classifying dispositions in adults, and this approach also can organize dispositional attributes in children as well (Caspi & Shiner, 2006; Grist & McCord, 2010; Kohnstamm, Halverson, Mervielde, & Havill, 1998; Measelle, John, Ablow, Cowan, & Cowan, 2005; Soto, John, Gosling, & Potter, 2008). The Big Five (see John, Naumann, & Soto, 2008) classify attributes under the domains of extraversion (attributes like assertive, energetic, and sociable), agreeableness (cooperative, kind, and trusting), conscientiousness (hard working, norm-abiding, and self-controlled), neuroticism (easily distressed, tense, and moody), and openness (curious, inventive, and open minded). The level of generality of the Big Five makes it possible to apply these domains to dispositions evident at multiple points in the life span.

Dispositions are a natural starting point for considering the potential origins of adult individuality. Dispositions or traits are the earliest emerging of the constructs in the hierarchical models of personality. A focus on early emerging dispositions thus unites researchers who study temperamental characteristics in children (e.g., Rothbart & Bates, 2006) with those who study personality traits in adults. The increasing awareness of the commonality between dimensions of temperament and adult personality traits represents an important step toward a unified study of life-span personality development (Caspi, Roberts, & Shiner, 2005; Clark & Watson, 2008; Donnellan & Robins, 2009). For example, we propose that researchers who study effortful control in children (e.g., Kochanska, Murray, & Harlan, 2000) and conscientiousness in adults (e.g., Bogg & Roberts, 2004) are in fact studying the same underlying disposition related to how adequately an individual channels her or his impulses in the service of pursuing long-term goals and following proscribed norms. Beyond uniting researchers in developmental psychology and personality psychology, evidence is also good that dispositional traits are consequential—they predict important life outcomes like crime, health risk behaviors, mortality, relationship qualities, and wealth (Hampson, Goldberg, Vogt, & Dubanoski, 2006; Moffitt et al., 2011; Ozer & Benet-Martínez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). For these reasons, we focus on dispositions for the remainder of this chapter.

To be sure, it seems quite likely that the dispositions evident early in childhood are elaborated into the totality of the adult personality and identity across development (see Rothbart, 2011). Consider the developmental antecedents of political orientation and ideology (e.g., Fraley, Griffin, Belsky, & Roisman, 2012). Babies and toddlers do not have political ideologies or think of themselves as conservatives or liberals in a meaningful sense. Nonetheless, there are indications that such political attitudes are rooted partially in temperamental qualities evident by early childhood (Block & Block, 2006b; Fraley et al., 2012). Attributes like curiosity and fearfulness may predispose individuals toward a more conservative or a more liberal ideology in adulthood. This possibility highlights the usefulness of considering dispositions for approaching the study of personality development across the life span.

Although our attention in this chapter focuses on the dispositional or trait level of individuality, it is important to reiterate that this is just one approach to personality research. McAdams and Olson (2010) provided an important review of the development of other levels of individuality in their hierarchical model. Nonetheless, the study of dispositions across the life span can serve as a template for studying the other levels of individuality. Constructs like goals, motives, and attachment styles can be subjected to the same kinds of analyses that have been applied to dispositions in terms of charting patterns of continuity and change across different periods of development. Likewise, the mechanisms that account for personality trait stability and the mechanisms that account for personality trait change would seem to apply well to all levels of individuality. Thus, the approaches outlined in this chapter should be broadly applicable to the developmental study of many different kinds of individual differences.

Distinguishing Different Types of Stability and Change Across the Life Span

One of the defining features of a personality disposition or trait is the notion that it is at least somewhat stable or consistent across time and relevant contexts. Thus, an important set of questions center around the different ways to conceptualize and assess personality stability. Not surprisingly, researchers who specialize in personality development have identified multiple kinds of personality stability and change. One fundamental distinction is made between heterotypic and homotypic stability or consistency (see Caspi & Bem, 1990). Heterotypic stability refers to the degree of consistency in the underlying disposition regardless of differences in the observed manifestation of the attribute at different points in development. The study of heterotypic continuity sometimes is referred to as the study of personality coherence across development. In contrast, homotypic continuity refers to the degree of consistency when considering the same manifest thoughts, feelings, and behaviors at multiple time points. Caspi (1998) noted that homotypic continuity most often is studied in adolescence through adulthood once it reasonably can be assumed that behavioral manifestations of an underlying disposition are invariant. In other words, researchers assume that the thoughts, feelings, and behaviors associated with a given disposition are the same at the different developmental periods under investigation.

Heterotypic continuity. Prototypic examples of heterotypic continuity involve attributes like aggression and shyness. These dispositions have different behavioral referents during childhood, adolescence, and adulthood. Shy toddlers hide behind caregivers when entering a room full of strangers and may burst into tears when forced to be the center of attention, whereas such behaviors are unlikely to characterize the behaviors of the shy adult. Aggressive adolescents may make fun of peers and attempt to defame their reputations, but such behaviors are unlikely to characterize the actions of an aggressive toddler. As should be evident from this discussion, the evaluation of heterotypic continuity requires an underlying theory about the nature of the disposition (e.g., Caspi, 1998; Patterson, 1993). Moreover, one must be a trait realist (e.g., Allport, 1937; Funder, 1991; Krueger, 2002) to meaningfully consider the possibility of heterotypic continuity. The idea is that the underlying disposition is more than just a description of behavior; rather, the disposition itself is a marker for a psychobiological entity that has causal force (see also Patterson, 1993).

Research into heterotypic continuity therefore requires a reasonably well articulated understanding of the psychological function of the disposition. For example, researchers may posit that a "fundamental feature" of extraversion (or surgency when referring to the individual difference in children; see Rothbart, 2011) is rooted in a psychobiological system that governs sensitivity to rewards and appetitive stimuli (e.g., Lucas, Diener, Grob, Suh, & Shao, 2000). The idea (in a nutshell) is that some individuals are more likely to approach rewarding stimuli than others because of the operation of an underlying psychobiological system. Such a seemingly abstract conceptualization of this disposition allows researchers to specify different ways that extraversion may manifest itself at different ages. This way of understanding extraversion can be used to justify an expected connection between an energetic style

of play and exploration at age 3 years and the pursuit of social interaction partners at age 33 years. Both sets of behaviors involve the pursuit of developmentally relevant rewarding stimuli.

At least three different strands of personality research are pertinent when it comes to evaluating heterotypic continuity. First and most directly, ongoing efforts to define the fundamental features of dispositions like extraversion and neuroticism (e.g., Ashton, Lee, & Paunonen, 2002; Lucas et al., 2000; Watson, Wiese, Vaidya, & Tellegen, 1999) provide researchers with a refined understanding of the basic affective and motivational processes that underlie basic traits. Second, research linking dispositions to neurological systems and structures (e.g., Canli, 2008; DeYoung, Hirsh, Shane, Papademetris, Rajeevan, & Gray, 2010; Nigg, 2000; Watson et al., 1999) helps constrain inferences about the fundamental features of traits and provides greater insights into the psychobiology of personality traits. Evidence that the same neurological structures and systems are related to superficially different behaviors at different ages helps bolster inferences about heterotypic continuity. Third, research and theorizing that seeks to explain the evolutionary significance of the Big Five domains helps researchers better understand the adaptive significance of variability (e.g., Buss, 2009; Denissen & Penke, 2008; Nettle, 2006). This work clarifies the functions of traits and helps to explain why personality variation has been maintained across generations.

Collectively, these three stands of research contribute to a deeper understanding of the functions of core traits. Such work helps personality researchers understand the psychological significance of variation in these dispositions. Such a deeper understanding can be used to formulate hypotheses about the observable referents of underlying dispositions or traits across the life span. Thus, developmental studies concerning personality dispositions are enhanced as research in these three areas progresses. This fact also underscores a broader point that personality development is an important area of synergy for seemingly diverse strands of individual difference research.

Homotypic continuity. Whereas the evaluation of heterotypic continuity is necessarily conceptual and strongly rooted in theorizing about the underlying disposition, the evaluation of different forms of homotypic continuity is tied strongly to particular summary statistics. These statistics quantify different elements of consistency. At least three different kinds of continuity are evaluated frequently at the level of a sample or population: structural stability (i.e., psychometric measurement invariance), absolute stability (i.e., mean-level stability), and differential stability (i.e., rank-order consistency). These three types do not exhaust all of the possibilities as researchers also must be aware of the existence of individual differences in change. Indeed, the fact that not all individuals follow sample-level trends is a critical but sometimes overlooked part of the study of personality development. Thus, we will pay particular attention to the idea of individual differences in change. We also should note that researchers sometimes investigate ipsative continuity, which reflects how strongly the relative patterning of personality dispositions are preserved over time. Investigations of ipsative consistency are relatively rare in the literature (e.g., Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2012) and involve complex statistical issues related to how best to quantify the similarity of profiles (e.g., Cronbach & Gleser, 1953; Furr, 2008; Ozer & Gjerde, 1989). Given these considerations, we will not cover ipsative continuity in this chapter, but interested readers can consult Caspi (1998, p. 349) for more conceptual details as well as Robins, Fraley, Roberts, and Trzesniewski (2001) and Roberts, Caspi, and Moffitt (2001) for empirical illustrations.

Structural stability or *measurement invariance* refers to the consistency of psychometric properties over time, including whether correlations between measures of different dispositions are similar across developmental periods (e.g., whether the correlation between neuroticism and extraversion is the same in young adulthood as old age). Investigations about measurement invariance are critical to developmental research even if they are not always widely conducted and reported (Horn & McArdle, 1992). The purpose of these kinds of investigations is to make sure that the same disposition is being measured in the same way across development. Establishing measurement invariance often is considered an important precursor to investigations of homotypic continuity.

Measurement invariance ensures, for example, that comparisons of mean-level differences in trait levels are sensible. If measures are not invariant, then taking a difference between two averages may amount to "comparing apples and spark plugs" (Vandenberg & Lance, 2000, p. 9). Likewise, if measures do not rank individuals in the same way at each wave of a longitudinal study, then providing a clear and unambiguous interpretation of the correlation between scores at any two time points is impossible. As it stands, evidence indicates that at least some measures of the Big Five domains are largely invariant across adulthood (e.g., Allemand, Zimprich, & Hertzog, 2007; Lucas & Donnellan, 2011; Zimprich, Allemand, & Lachman, 2012).

Absolute stability refers to the degree of consistency in the amount or level of a given disposition over time. Usually, this kind of consistency is assessed by comparing mean-scores longitudinally by following the same sample of individuals across a meaningful interval. The focal question is whether average levels increase, decrease, or basically stay the same across different age periods. Questions about mean-level differences help to chart normative patterns of personality development. For instance, the existing research suggests that levels of conscientiousness increase from late adolescence to adulthood (Roberts, Walton, & Viechtbauer, 2006). Put differently, the typical level of conscientiousness is higher for 40-year-olds than it is for 20-year-olds.

Differential stability refers to the degree of consistency in rank-order standing on dispositional measures. For example, research concerning differential stability can answer the question as to whether relatively agreeable adolescents also are likely to develop into relatively agreeable adults. The degree of differential stability for a disposition typically is assessed by evaluating the size of the correlation between measures administered at two time points using a longitudinal design (these correlations often are called stability coefficients). A large correlation is interpreted as evidence for the preservation of individual differences across time, whereas a small correlation usually is interpreted as evidence that a construct is more state-like than dispositional.

Researchers increasingly are recognizing the limitations of two-wave approaches for understanding personality development (Fraley & Roberts, 2005). The basic problem is that different kinds of developmental processes can generate the same observed stability coefficients when an analysis is restricted to a single coefficient. A more informative approach is to evaluate patterns of correlations from multiwave studies that span appreciable lengths of time (e.g., Donnellan, Kenny, Trzesniewski, Lucas, & Conger, 2012; Fraley, Vicary, Brumbaugh, & Roisman, 2011). Such studies, however, are relatively rare and a considerable amount of attention has been placed on the interpretation of stability coefficients across two measurement occasions. Thus, we raise this point about evaluating patterns of stability coefficients as an important area for future research.

Differential stability is statistically and conceptually different from absolute stability. Consider that a sample could increase substantially on a disposition like agreeableness as individuals mature from adolescence to middle age, but the rank ordering of individuals could be maintained if everyone increased by roughly the same amount. Conversely, the rank ordering of individuals could change substantially over time without producing any net impact on size of the mean difference if the increases offset the decreases (Roberts et al., 2006). Thus, investigations of absolute and differential stability provide complementary perspectives on the nature of personality development. Likewise, it is important to keep in mind that sample or population-level summary statistics such as mean differences and correlation coefficients provide only a part of the story of personality development.

Individual differences in change. Researchers who specialize in personality development have gained an increased appreciation for the importance of an individual difference perspective on personality change (Roberts & Mroczek, 2008). The concept of individual differences in change refers to the observation that individuals may show different patterns of increases or decreases in absolute levels of a personality trait over time. The amount and direction of personality change (or stability) is yet another individual difference variable. The key insight from this strand of developmental research is that individuals

often have relatively unique patterns of personality development.

Individual differences in change can be illuminated by modeling individual change trajectories using growth curve methods (e.g., Vaidya, Gray, Haig, Mroczek, & Watson, 2008), or by identifying the percentage of individuals who conform to or deviate from the sample-level trends (e.g., Roberts et al., 2001). For example, although there is typically an increase in average levels of conscientiousness from adolescence to adulthood, Vaidya et al. (2008) found that there were individual differences in changes in this disposition. Some individuals increased more than others and some individuals even declined in this trait, thereby proving to be interesting exceptions to the normative pattern.

Once researchers establish the existence of meaningful individual differences in change, the important question of understanding why these differences exist must be addressed. Exposure to different life events seems to help explain some of these differences (reviewed in Roberts et al., 2008). For example, people who experience more successful and satisfying careers in young adulthood increase disproportionately on measures of emotional stability and conscientiousness (Roberts, Caspi, & Moffitt, 2003). Similarly, initiating and staying in a committed relationship in young adulthood is associated with increases in conscientiousness and decreases in neuroticism (Lehnart, Neyer, & Eccles, 2010; Robins, Caspi, & Moffitt, 2002). Emerging evidence suggests that different life experiences appear to be tied to particular patterns of personality development. The systematic evaluation of the correlates of individual differences in change is an important topic for future studies.

In sum, it is important to emphasize that there are several different ways of conceptualizing and quantifying personality stability and change. A great deal of confusion occurs when questions about personality development are framed as a simplistic matter of whether personality changes or stays the same. A complete understanding of personality development requires the use of specific language and a comprehensive approach that assesses multiple kinds of stability and change. Moreover, the evaluation of heterotypic continuity requires a conceptual understanding of the underlying disposition and how it manifests at different developmental periods. The next sections review evidence supporting the existence of heterotypic continuity and summarize research on the absolute and differential stability of the dispositions captured by the Big Five domains. A considerable number of studies have addressed the absolute and differential stability of the Big Five domains, and several meta-analytic reviews are available for drawing broad conclusions about these two types of personality stability.

EVIDENCE OF PERSONALITY COHERENCE ACROSS THE LIFE SPAN

Some of the most impressive evidence of personality coherence is found in large-scale longitudinal studies that have followed individuals from early childhood into adulthood and even midlife. Although these kinds of studies are relatively rare, this is changing in line with renewed interest in personality constructs in the field and as participants in ongoing studies are growing older. Development takes time, however, and such studies naturally will outlive the professional careers of a single cohort of researchers. This is one of the primary challenges to the field in terms of finding ways to develop vibrant ongoing studies that can outlast the vision of a single investigator or team of investigators (Block & Block, 2006a).

One example of a large-scale study that provides long-term evidence of personality consistency is the Hawaii Personality and Health Cohort. This project has followed roughly 2,400 individuals from the time they were elementary school children in the early 1960s through to the present (Hampson & Goldberg, 2006). A recent investigation using a subset of participants from this project found correspondence between ratings of these individuals made by their elementary school teachers and observer ratings of those same individuals at midlife (Nave, Sherman, Funder, Hampson, & Goldberg, 2010). Children rated as talkative by teachers developed into middle-age adults who were observed to be assertive and socially forceful. Children who were rated by their teachers as able to cope with new situations were observed to be cheerful and

confident as middle-age adults. These correlations were not overwhelmingly strong; however, they reflect a degree of personality coherence that was impressive given the time span and multimethod design of this study.

The Dunedin Multidisciplinary Health and Development Study (e.g., Caspi et al., 2003; Caspi, Moffitt, Newman, & Silva, 1996; Moffitt et al., 2011) also has provided important evidence of heterotypic continuity. This project has followed an entire birth cohort of more than 1,000 individuals born in a single New Zealand city into their late 30s. Several studies from this project provide evidence of personality coherence related to attributes like aggression, antisocial behavior, and impulsivity. For example, there were associations between observer ratings of 3-year-old children as being impulsive, restless, and negative and adult outcomes at age 21 years related to antisocial personality disorder, suicide attempts, and alcohol problems in males (Caspi et al., 1996). The fact that there is a connection between preschool attributes as assessed by observers and conceptually related adult outcomes is evidence for the coherence of traits related to difficulties with impulse control.

As noted in the previous section, the starting point for understanding heterotypic continuity is a well-articulated theoretical model of the underlying disposition. Such a model must be able to tie together different behavioral manifestations of the same underlying trait at different ages in a convincing fashion. For example, Patterson (1993) defined the antisocial trait as a way of interacting with others that maximizes short-term gains. The idea for Patterson is that temper tantrums and general defiance evident early in childhood are behaviors that children enact so that they can do what they want to do in the short term. This same underlying motivational dynamic toward short-term gratification of impulses manifests itself as criminality and substance use during adolescence and adulthood. Thus, Patterson's theorizing about the nature of the general antisocial trait is one way to understand the psychological coherence in the Dunedin findings. The following section provides a summary of research pointing to evidence of different forms of homotypic continuity.

Mean-Level Changes in the Big Five Across the Life Span

Mean-level differences in the Big Five can be investigated using longitudinal or cross-sectional designs. Both kinds of studies attempt to estimate the typical level of a disposition at different points in the life span. Large-scale cross-sectional studies based on national data sets and extremely large Internet samples often find that middle-age individuals tend to score higher than young adults on agreeableness and conscientiousness and lower on extraversion, neuroticism, and openness (Lucas & Donnellan, 2009; Soto, John, Gosling, & Potter 2011). One critical limitation of cross-sectional studies is that they confound age differences with cohort differences. Thus, researchers prefer longitudinal studies to determine whether patterns of personality differences are linked with age per se as opposed to birth cohort.

Fortunately, the cross-sectional trends generally converge with longitudinal results. In particular, mean-level differences in the Big Five domains were summarized in a meta-analysis of 92 longitudinal studies that collectively covered the ages from 10 to 101 years (Roberts et al., 2006). Significant mean-level changes in all trait domains were found at some point in the life course. In other words, average levels of personality seem to change throughout adulthood. Beyond this generalization, several important insights can be drawn from the findings reported in the Roberts et al. (2006) meta-analysis.

First, although the majority of mean-level changes occurred between the ages of 20 and 40 years, at least some mean-level differences were evident across the life span. These findings point to young adulthood (as opposed to adolescence) as a critical phase in the life span for personality development. The concentration of personality changes in young adulthood also hints at the possibility that role changes with respect to work, intimate relationships, and sometimes parenthood are salient factors in personality development, given that so many of these changes occur during the young adult years (Rindfuss, 1991). In addition, the finding that changes are evident across the life span contradicts an often-quoted passage from William James stating that personality is set like plaster by age 30 years. Mean-level changes certainly are not dramatic in

middle age and beyond, but evidence of average differences across different age-groups underscores the point that personality development occurs throughout the life course.

Second, the general directions of the mean-level changes are seemingly positive. People become more socially mature in terms of mean-level increases in confidence, warmth, responsibility, and emotional stability. These attributes generally are associated with important life outcomes, such as lower levels of criminality, health risks, and mortality; reduced risks of psychological problems; and increased job performance and relationship stability and quality (e.g., Hampson et al., 2006; Kotov, Gamez, Schmidt, & Watson, 2010; Miller & Lynam, 2001; Ozer & Benet-Martínez, 2006; Roberts et al., 2007). The generalization about the positive direction of personality change has been formalized as the maturity principle of adult personality development (Caspi et al., 2005; Roberts et al., 2001). Put differently, individuals who are more agreeable, conscientious, and emotionally stable are more effective in their personal and professional lives and they tend to be healthier and live longer (e.g., Roberts et al., 2007). These personality attributes seem to produce positive consequences in both the agentic and communal domains of life (getting ahead and getting along), and this may explain why mean levels appear to change in these ways. The positive outcomes associated with particular trait levels might be reinforcing and thereby provide an impetus toward a certain normative pattern of personality trait development.

Third, the length of the longitudinal study is correlated positively with evidence of personality trait change. This finding has potentially important theoretical ramifications that might not be immediately obvious. A common assumption is that personality traits act like metabolic set points. People may stray briefly from an innate level of a given attribute, but the set-point perspective posits that individuals will tend to drift back to their biologically based set point (reviewed in Kandler et al., 2010). If such a model applied well to personality dispositions, there should be little expectation of a positive association between time and mean-level change. That is, set-point models suggest that personality changes represent short-term fluctuations that dissipate with time. The meta-analytic findings, however, counter this prediction, suggesting that a strong set-point model is not the most appropriate way to conceptualize personality trait development.

In sum, existing research has mapped out the "normative" developmental trends for the core dispositions captured by the Big Five. This literature indicates that young adulthood is an active period of personality development. Most mean-level changes are positive, at least until the very end of the life span. Average trait changes are in the direction of an increased capacity to fulfill adult roles and toward more satisfying and rewarding intrapersonal and interpersonal outcomes. These findings should motivate researchers to better understand why personality traits change more in young adulthood than in other periods of the life course and to uncover the mechanisms that explain the maturity principle.

Differential Stability of the Big Five Domains Across the Life Span

Longitudinal designs are required to evaluate differential stability, and the same two findings have characterized the differential stability of core dispositions since the question was first investigated. First, dispositions demonstrate modest to high rank-order consistency (e.g., retest correlations or stability coefficients between .4 and .6) over reasonably long periods of time (e.g., 4–10 years) when considering the results of meta-analytic reviews on the topic (e.g., Ardelt, 2000; C. J. Ferguson, 2010; Roberts & DelVecchio, 2000). Second, the size of the retest correlations depends on the time interval investigated: the longer the time interval between assessments, the lower the stability correlation (e.g., Fraley & Roberts, 2005).

As was the case for mean-level differences, meta-analytic findings concerning differential stability provide several important insights about the nature of personality development. Foremost, these studies support the conclusion that individual differences persist over time and they most certainly are not ephemeral. Across hundreds of studies, test–retest correlations for personality are at least moderate in magnitude, even from childhood to early adulthood. The only psychological constructs that have higher

stability coefficients are measures of cognitive ability (Conley, 1984; Schuerger, Tait, & Tavernelli, 1982). Moreover, the level of continuity in childhood and adolescence is much higher than originally expected, especially after age 3 years. Individual differences in children persist, and this is one reason why the study of temperament is important for developmental psychology (see Rothbart, 2011). Personality attributes are seemingly stable enough to be considered causal entities that are associated with adaptation across the life span (Caspi et al., 2005).

In addition, meta-analytic studies point to an interesting developmental patterning to the stability coefficients. It seems that differential consistency increases from childhood to adulthood, reaching a plateau around .70 between ages 50 and 70 years. Personality traits demonstrate a clear pattern of increasing continuity across the life course. This pattern is referred to as the cumulative continuity principle of personality development—traits become more consistent with age when considering differential stability (Roberts & Wood, 2006). The stability coefficients are even higher when attempts to account for measurement unreliability are factored into the analyses (C. J. Ferguson, 2010). These coefficients do not approach unity, however, and this too supports the notion that personality traits can change at any point in the life span.

An emerging issue in the literature concerns whether stability coefficients decline in old age (Ardelt, 2000). A curvilinear pattern for stability coefficients was found for global self-esteem (Trzesniewski, Donnellan, & Robins, 2003), but evidence of this pattern for the Big Five domains has been inconsistent. This partly is due to practical issues given that relatively few longitudinal studies have followed large numbers of older participants to fully evaluate this possibility (Lucas & Donnellan, 2011). Fortunately, Lucas and Donnellan were able to analyze data from approximately 14,000 participants in the German Socio-Economic Panel Study who completed a short measure of the Big Five attributes twice across a 4-year interval. Thus, they had access to relatively large numbers of older individuals who were participating in an ongoing national study. They found that 4-year stability coefficients for measures of several of the Big Five domains declined after around age 70 years even correcting for measurement unreliability. This finding needs to be replicated (see Wortman, Lucas, & Donnellan, 2012), but such a pattern is sensible from a life-span perspective. The biological and social changes and accompanying limitations in agency that occur at the end of life may generate personality changes that are unique to individuals. Indeed, it is important to consider the processes that account for personality consistency across the life span when evaluating changing patterns of stability coefficients.

Mechanisms of Personality Development

One consistent theme that has emerged from the past 20 or so years of research concerning personality trait development is the importance of understanding the mechanisms that promote stability and the mechanisms that promote change (e.g., Caspi & Bem, 1990). Broadly speaking, stability and change are produced by person–environment transactions. One critical insight offered by earlier reviews is that different sets of person-environment transactions produce personality stability as opposed to personality change (Caspi & Roberts, 2001; Caspi & Shiner, 2006; Roberts, 2006; Roberts & Pomerantz, 2004; Roberts et al. 2008). Roberts (2006) provided the ASTMA (attraction, selection, transformation, manipulation, and attrition) acronym as a way to organize many of these processes into a useful mnemonic. (A more elaborate discussion of processes that promote consistency and change can be found in Roberts et al., 2008.) The processes of attraction (A), selection (S), manipulation (M), and attrition (A) are most relevant for understanding how individual differences are maintained over time. These four processes seem to promote personality consistency.

Attraction refers to the processes whereby individuals are attracted to certain life paths because of their dispositions. People seek out environments and particular niches because of who they are as individuals. Individuals select certain kinds of peers, jobs, and lifestyles based on their individual dispositions. For example, people who score higher on measures of creativity are more likely to enter into and excel at artistic careers (Helson, Roberts, &

Agronick, 1995). One reason is that a closer fit between persons and contexts seems to feel "right" for individuals (e.g., see Cesario, Grant, & Higgins, 2004). These contexts, in turn, reinforce and enhance the dispositions that promoted the individual to seek out these contexts in the first place.

Selection refers to the fact that organizations like employers and schools "pick" individuals because of their dispositions. Companies and universities select people who are perceived to possess the qualities necessary to succeed in specific occupations and roles in the organization. Salespeople often are hired because of their levels of extraversion. Graduate students are selected because of high levels of conscientiousness and curiosity (in addition to high levels of intelligence). The distinction between attraction and selection concerns whether the individual was active or relatively passive in making the sorting decisions. Nonetheless, the outcomes of both attraction and selection are similar in that the context reinforces individual dispositions that were at least somewhat matched to the environmental press of the social context.

Manipulation refers to the process whereby individuals actively shape their social contexts to bring them in closer accord with their dispositions (Buss, 1987). Individuals have agency and often strive to increase the fit between their dispositions and their social environments. In a similar fashion, individuals may leave contexts that do not fit well with their dispositions (e.g., attrition). This attrition can occur because of active choices, the actions of others, or a complex blend of both (e.g., being fired from a sales job, going through a divorce).

These four processes of attraction, selection, manipulation, and attrition act to generate a positive correlation between the characteristics of the individual and the conditions of the social environment. One further developmental insight is that individuals are given more autonomy and agency as they transition into adulthood (Scarr & McCartney, 1983), and thus individuals may have more opportunities to match their dispositions with their social settings with age. The processes of attraction, selection, manipulation, and attrition in conjunction with consideration of agency may explain the cumulative continuity principle of personality development.

Two additional complementary mechanisms also may explain the existence of personality consistency—reactive and evocative person–environment transactions. Reactive transactions occur as people construe the same objective social environment differently because of their personalities. Individuals interpret ambiguous environmental cues differently because of their dispositions, and these interpretations can set in motion self-fulfilling prophecies. For instance, an individual low in agreeableness may interpret a neutral social cue as an indicator of disrespect (i.e., the so-called hostile attribution bias; see Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Evocative person–environment transactions occur when individuals elicit characteristic responses from the social environment because of their underlying dispositions. Individuals with hostile and aggressive personalities evoke aggressive responses from others. This mechanism was demonstrated in a laboratory-based game designed to study aggressive responses in a controlled setting (C. A. Anderson, Buckley, & Carnagey, 2008).

As with the other mechanisms, reactive and proactive person–environment transactions generate a positive correspondence between the disposition and the features of the social situation. The press of the situation matches the dispositions of the individuals in those situations. Such a positive correlation is thought to promote consistency rather than serve as the impetus for any sort of personality change. Thus, the positive coupling of the characteristics of the individual and the features of the social environment may explain personality stability across the life span.

Of the five elements of the ASTMA acronym, only one refers to the processes that can promote personality change—transformation (T). This is the idea that personality attributes are changed by their life experiences. The differences in the number of mechanisms associated with consistency versus change suggests that the processes for maintaining consistency are more extensive and better elaborated than those that promote change. Block (1982) long ago suggested the individuals followed a certain adaptive imperative that privileged stability over change: "Assimilate if you can; accommodate if you

must!" (p. 286). Assimilation in this context refers to consistency-promoting mechanisms, whereas accommodation refers to mechanisms that promote change. One of the implications of this maxim is that although personality changes are possible, they may not be particularly common or easy to achieve. Toward this end, Roberts et al. (2008) provided a more comprehensive discussion of why personality changes are not particularly large (on average) in adulthood.

One of the most important potential mechanisms for promoting personality transformation or change is rooted in the very basic behaviorist principle drawn from the law of effect (e.g., Thorndike, 1933): Behaviors that produce satisfying, pleasant, or positive consequences will tend to be repeated, whereas behaviors that generate distressing, annoying, or negative consequences will be less likely to be repeated. Individuals respond to rewards and punishments. New situations with new reward structures can change behavior, especially when previous ways of thinking, feeling, and behaving are actively discouraged and new ways of behaving are made salient (Caspi & Moffitt, 1993). This seemingly simple idea may explain why some major life transitions, such as entering a marriage, becoming a parent, entering the military, or assuming an important job, in fact may alter characteristic ways of thinking, feeling, and behaving. These transitions typically limit agency and subject the individual to different sets of contingencies. As noted earlier, the law of effect also may explain the mean-level changes in personality traits observed across the life span. Certain trait levels might produce positive outcomes, and this process therefore might shape and reinforce a normative pattern of personality development.

Additional transformative processes coupled with an internal motivation to change also might generate personality changes. These processes are more speculative, however. For example, it is possible that intense self-reflection paired with therapeutic interventions designed to change thoughts, feelings, and behaviors (such as cognitive behavioral therapy) might lead to personality change. Smith, Glass, and Miller (1980) conducted the classic meta-analysis on the efficacy of psychotherapy and documented that therapy changed personality traits in addition to many other outcomes. In short, personality change might be possible, especially when individuals are motivated and provided with the necessary tools to change their dispositions. Given the importance of the possibility of personality change, we now turn our attention to a more thorough consideration of personality change and the broader implications of personality change for society.

THE PROSPECTS OF PERSONALITY CHANGE AND POTENTIAL IMPLICATIONS FOR SOCIAL POLICY

An important initial question concerns the strength of the evidence that personality actually changes with intervention. As it stands, a few studies have investigated the impact of direct intervention across a number of personality domains. For example, after a 20-week cognitive behavior therapy intervention aimed at treating depression, patients changed on a number of personality traits, most notably in traits linked with extraversion and neuroticism (Clark, Vittengl, Kraft, & Jarrett, 2003). Changes in self-reported personality traits that co-occur with therapy could reflect actual personality changes or may stem from the fact that transitory levels of depressive symptoms affect the initial assessment of trait levels of personality (Clark et al., 2003). Several lines of research, however, counter this conclusion (Soskin, Carl, Alpert, & Fava, 2012). First, at least a few studies have tracked changes in personality traits over multiple years after intervention, and they have shown that personality changes that result from therapy tend to be retained (e.g., Dancyger, Sunday, Eckert, & Halmi, 1997). Second, several studies have tested this idea by pitting the effects of decreasing depression found in control groups on changes found in therapy groups and have shown that the simple diminishment of depressive symptoms does not fully account for changes in personality traits (Quilty et al., 2008; Tang et al., 2009).

If personality traits can be changed through therapeutic intervention, what then are the effective ways of creating change? There are hints that personality traits change in response to a combination

of therapy and medication (Santor, Bagby, & Joffe, 1997). For example, DeFruyt, Van Leeuwen, Bagby, Rolland, and Rouillon (2006) found evidence for a mean-level decrease in neutoricism ($d = -.55$) for individuals treated with a combination of therapy and pharmacotherapy. Similarly, Tang et al. (2009) found that both cognitive therapy and selective serotonin reuptake inhibitor medication (Paroxetine) were associated with changes in neuroticism and extraversion compared with a control group. There was no evidence of a significant difference between the two treatment conditions. The raw effect size estimates from Tang et al. (2009) in a *d*-metric were −.54 (cognitive therapy) and −.80 (Paroxetine) for neuroticism and .49 and .64 for extraversion (cognitive therapy and Paroxetine, respectively).

Tang et al. (2009) conducted further analyses on personality change controlling for depression change and found that both personality effects persisted for the Paroxetine group, whereas only the extraversion effects persisted for the cognitive therapy group. Power could be an issue because the Paroxetine group was twice the size of the therapy group (120 vs. 60). Nonetheless, Tang et al. (2009) found some indications that the personality changes were not simply an artifact of changes in depressive symptom reporting. A more general issue with these intervention studies is the limited time frame used to evaluate personality change. The De Fruyt et al. (2006) study was based on a 6-month follow-up, whereas Tang et al. (2009) was based on an 8-week follow-up. Future research is needed with much longer intervals.

Beyond clinical interventions, other types of intervention studies demonstrate that personality traits are amenable to change. For example, a recent intervention trained medical students to become more mindful (Krasner et al., 2009). Krasner quantified changes using *d*-metric effect size estimates and their intervention seemed to affect empathy ($d = .45$), emotional stability ($d = .45$), conscientiousness ($d = .29$), and agreeableness ($d = .18$, $p = .05$) based on results across a 15-month follow-up. Similarly, a program designed to improve social skills for recovering substance abusers led to increases in agreeableness, conscientiousness, and emotional stability over a 15-month span (Piedmont, 2001). Piedmont did not report *d*-metric effect size estimates for these changes, but we estimated them based on information in the original report (see Piedmont, 2001, table 1). These estimates were .50, .47, and .56 for agreeableness, conscientiousness, and emotional stability, respectively. Most recently, a cognitive training intervention for older adults also was associated with increases in openness to experience (Jackson, Hill, Payne, Roberts, & Stine-Morrow, 2012). This increase amounted to a *d*-metric effect size estimate of .26 for the treatment group compared with −.07 for the control group.

In short, there are intriguing hints that interventions may change dispositions, and this is an important topic for future research. The existing literature is scattered across different disciplines and has not been well integrated with contemporary research in personality psychology. Indeed, much more needs to be learned about the possibility of changing personality dispositions through direct intervention. Most studies are based on a relatively short time spans, and thus it is unclear whether any changes are sustained across multiple years. People may revert to initial levels. Likewise, few of these studies have specified clearly the precise theory underlying the intervention that stipulates the exact mechanism or mechanisms responsible for personality changes. Such information is critical for generalizing intervention strategies.

Regardless of any potential gaps in the literature, it is worth contemplating the long-term implications of sustained personality change. As it stands, most existing psychological and educational interventions focus on specific and proximal thoughts, feelings, attitudes, and behaviors. For example, several interventions have been designed to reduce or eliminate smoking, drunk driving, or risky sexual behaviors, or alternatively, to increase motivation at work. These specific objectives may limit the generality of the intervention. In contrast, an intervention aimed at the broad disposition of conscientiousness might prove much more efficient and effective at achieving all of these outcomes. Indeed, this trait is associated with reduced health risks of all sorts (Bogg & Roberts, 2004), and it is one of the most robust "noncognitive" predictors of success in achievement

settings (Barrick & Mount, 1991; Poropat, 2009). Thus, efforts to increase conscientiousness may provide dividends across a number of different domains.

The possibility that broad dispositions can be changed opens up interesting and provocative policy implications. This area certainly represents an important point of synergy between the basic and applied branches of psychology. Efforts to decrease an attribute like neuroticism may leverage positive outcomes across numerous domains, given that this attribute seems to have considerable public health significance (e.g., Cuijpers et al., 2010; Lahey, 2009). Small decreases in neuroticism may not have huge effects on any one outcome, but the cumulative impact could be substantial when viewed in the aggregate. Any optimism about changing traits should be balanced by an acknowledgment that lasting change might be quite difficult to achieve, and it may even generate unintended consequences. Indeed, evolutionary perspectives on trait variation suggest that any level of a given trait may have certain advantages given particular environmental conditions (Nettle, 2006).

Implications of Developmental Research for Personality Psychology and a Few Future Directions

Research about personality development is one of the more active and exciting threads in contemporary personality psychology. Developmental research may even force researchers to reevaluate two prominent perspectives on the trait construct—the essentialist versus the contextualist viewpoints (Roberts, 2009). The essentialist viewpoint emphasizes the idea that traits are biologically based entities that change very little over time (e.g., McCrae & Costa, 2008) and places traits as critical causal entities. The contextualist perspective, on the other hand, largely denies the importance of global traits (e.g., Mischel, 2009). This viewpoint emphasizes the variability of behavior across different situations. Personality consistency is evident only when the individual is presented with the same situational inputs. The situation is therefore critical and, not surprisingly, the contextualist viewpoint is emphasized strongly in social psychology.

The view of human nature provided by developmental research falls squarely in between the essentialist and contextualist perspectives. Dispositions are consistent over time, but they are not absolutely consistent. Situations affect behavior, but individuals living in the real world select and create their own situations based on their personal dispositions. Situational choice exists outside the confines of the laboratory settings favored by experimental social psychologists. Personality traits therefore are considered to be *relatively* enduring psychological constructs that can change with time and experience. Moreover, they are consistent enough to be considered causal forces, but personality dispositions change enough to make personality change a phenomenon of interest. Ultimately, this perspective synthesizes the poles captured by the essentialist and contextualist viewpoints (Roberts, 2009). Future theoretical systems, by necessity, will need to accommodate the observation that personality dispositions are consistent, consequential, and yet also dynamic.

An implication of this emerging developmental synthesis is the need to consider personality traits as dependent variables in longitudinal studies rather than solely as independent variables assessed at a single time point. An additional reason to consider personality traits as dependent variables is that personality trait change may be quite consequential for people. Mroczek and Spiro (2007) demonstrated that long-term increases in neuroticism were predictive of mortality in an 18-year survival analysis. Personality changes literally might be related to matters of life and death.

In the service of more thoroughly and systematically evaluating predictors of personality change, we can identify several other future directions. Many of these emphasize methodological advances that can be used to generate increased confidence in the existing database. First, there is a pressing need for researchers to move beyond the two-wave design and use more sophisticated versions of longitudinal studies. Two data points do not provide a strong foundation for the study of change (Rogosa, Brandt, & Zimowski, 1982; Willett, Singer, & Martin, 1998). Multiple waves of data provide researchers with a more precise understanding of the pattern of

personality changes and provide more reliable estimates of change (Roberts et al., 2008). The timing of assessments in a longitudinal study is an additional issue that requires more attention. Timing often is dictated by practical concerns, such as the ease of data collection, whereas it would be far more ideal if decisions about the timing of measurements were determined by theoretical expectations about the underlying processes (see Selig & Preacher, 2009 for a discussion).

Future longitudinal research should strive to distinguish age-related developmental change from cohort effects, given debates over the relative strength of age versus cohort in explaining personality differences (e.g., Roberts, Edmonds, & Grijalva, 2010). The cohort-sequential design is useful for disentangling these influences on development (e.g., Schaie, 1965) and short-term, cohort-sequential designs can be linked together to provide developmental insights across a longer period of time (e.g., E. R. Anderson, 1993; see also Lucas & Donnellan, 2011). Such approaches would seem to be a useful way to help address how well longitudinal findings from a single cohort generalize to other cohorts.

In addition to using more sophisticated longitudinal designs, developmental studies need to more fully employ multiple informant approaches. On the one hand, we recognize that many challenges are inherent in just running a longitudinal study that is restricted to self-reports. Moreover, we believe that self-reports have considerable validity, and we are sympathetic to the perspective that individuals have an important and potentially privileged perspective when it comes to reporting on their inner thoughts and feelings (see Lucas & Baird, 2006). Limitations, however, are associated with self-reports, as is true of any single approach to measuring a construct. The ideal approach would be to assess personality attributes repeatedly using multiple methods to ensure that developmental trends generalize across methods of assessing personality. Alternatives to self-reports could involve repeated lab tasks designed to elicit behavioral manifestations of personality traits as well as methods for assessing personality as it is expressed in real-time using unobtrusive recording devices so researchers can determine the behavioral signatures of different personality traits (e.g., Holtzman, Vazire, & Mehl, 2010). These multimethod approaches provide researchers with more options for isolating "true" personality variance from unique sources of variance specific to particular assessments, including measurement errors.

One perhaps less-intensive approach to supplementing self-reports of personality is to invest more effort in obtaining informant reports at multiple occasions (e.g., Vazire, 2006; Watson & Humrichouse, 2006). Indeed, informant reports are used widely when studying the consistency of temperamental attributes in children (e.g., Neppl et al., 2010). Informants for adults could be romantic partners, work colleagues, friends, supervisors, or parents. One complicating issue is the need to obtain reports from the same informant at multiple time points to avoid confounding changes in personality with changes in informants. Informants will have different vantage points to observe the target individual and different kinds of informants may have different biases. Moreover, rating biases may change systematically with time as relationships change. This complication might occur when using informant reports from romantic partners and spouses (Watson & Humrichouse, 2006). Those new to the relationship may idealize their partners to some extent at the beginning of the relationship, but this positivity bias may attenuate with the length of the relationship. Sophisticated analytic approaches will be needed to separate true personality changes from sources of measurement error. Nonetheless, informant report studies would seem to offer an important and neglected perspective in research on personality development in adults (Watson & Humrichouse, 2006).

In describing these methodological advances, we would be remiss if we did not emphasize the importance of using methods in the service of advancing the science of personality development. It is easy to get caught up in the complexities and intriguing analytic possibilities afforded by longitudinal data coupled with "hot" statistical modeling techniques. The excitement over this technology of the field, however, should not distract researchers from the basic mission of understanding the origins, trajectories, and consequences of personality development.

The field needs to continue to answer these big questions (Block & Block, 2006a).

CONCLUSION

This chapter stressed several themes, and these themes can guide future research and theorizing. First, developmental research conclusively demonstrates that personality attributes are relatively enduring psychological constructs that are both stable and changeable at the same time. Second, the general direction of adult personality development is positive in terms of increases in the dispositions that promote effective functioning in both the agentic and communal realms of life. Not all individuals follow this normative pattern, however, a fact that highlights the importance of studying individual differences in change. Third, stability and change are an outcome of dynamic processes involving the individual and her or his social contexts. Research in personality development is poised to make contributions to public policy if the field can figure out how to systematically promote personality trait changes in ways that facilitate better health and economic outcomes. All told, the study of personality development represents an important area of synergy for psychological science that may have considerable practical advantages if such scientific findings can be used to promote positive personality changes for all individuals.

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