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PERSONALITY DEVELOPMENT: Stability and Change

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■ **Abstract** In this review, we evaluate four topics in the study of personality development where discernible progress has been made since 1995 (the last time the area of personality development was reviewed in this series). We (*a*) evaluate research about the structure of personality in childhood and in adulthood, with special attention to possible developmental changes in the lower-order components of broad traits; (*b*) summarize new directions in behavioral genetic studies of personality; (*c*) synthesize evidence from longitudinal studies to pinpoint where and when in the life course personality change is most likely to occur; and (*d*) document which personality traits influence social relationships, status attainment, and health, and the mechanisms by which these personality effects come about. In each of these four areas, we note gaps and identify priorities for further research.

CONTENTS

THE STRUCTURE OF PERSONALITY: DEVELOPMENTAL CONSIDERATIONS

Both child psychologists and adult personality researchers study individual differences, but historically the two groups have done so within different research traditions. Child psychologists have focused on temperament traits, the behavioral consistencies that appear early in life, that are frequently but not exclusively emotional in nature, and that have a presumed biological basis (Shiner 1998). Researchers studying adults have focused on personality traits, which encompass a broader range of individual differences in thinking, feeling, and behaving. The last decade has been a vibrant, productive period in the study of the links between early temperament and later personality (Graziano 2003). From the point of view of this emerging developmental science of personality, childhood temperament should be conceptualized with an eye toward adult personality structure, and adult personality should be understood in light of its childhood antecedents.

The conceptual distinctions between temperament and personality traits have been challenged by recent empirical work demonstrating similarities between the two domains of individual differences (McCrae et al. 2000). Temperament traits by definition appear earlier, and they tend to be more narrow, lower-level traits. However, like temperament traits, nearly all personality traits show moderate genetic influence (Bouchard & Loehlin 2001), and individual differences in "personality traits" have been identified in nonhuman animals (Gosling 2001). Like personality traits, temperament traits are not immune from experience. Behavioral genetic studies have established that individual differences in temperament, measured even during the first few years of life, are only partially heritable and are influenced by environmental experiences (Emde & Hewitt 2001). Further, differences in the experience and expression of positive and negative emotions are at the heart of some of the most important temperament and personality traits (Rothbart et al. 2000, Watson 2000). Temperament and personality traits increasingly appear to be more alike than different.

The Perils and Promise of Studying Personality Structure Across the Life Course

One of the most challenging tasks in the study of personality across the life course has been to develop a taxonomy of traits: What are the most reliable patterns of covariation of traits across individuals? The elucidation of a taxonomy for youth has been particularly challenging because children's maturation enables them to display an increasingly differentiated set of traits. Children develop rapidly from manifesting only a small number of emotions during early infancy—interest, contentment, and distress—to manifesting an expanded set of emotions—including joy, sadness, anger, fear, empathy, pride, shame, and guilt—by age 3 (Eisenberg 2000, Lewis 2000). The emotion-based individual differences children can display therefore change quickly in number and content during these years. Similarly rapid developments in motor skills, cognition, and language may at times make the attempt to develop a taxonomy of early individual differences seem like trying to hit a moving target.

Despite the challenges inherent in mapping out temperament and personality structure across the life course, researchers have made substantial progress in elaborating taxonomies of individual differences in both childhood and adulthood. One of the earliest and still best known temperament models is the Thomas-Chess nine-trait structure (Thomas et al. 1963). Work that is more recent has identified limitations of this model. Factor analyses of questionnaires designed to measure the original dimensions have uncovered fewer than nine factors, and the original model obscured the fact that young children's tendencies toward positive and negative affect are independent from each other (Rothbart & Bates 1998, Shiner & Caspi 2003). Current models of temperament in infancy and toddlerhood typically include the following six traits: activity level; positive emotions/pleasure; irritable distress/anger/frustration; fearful distress/withdrawal from new situations (including social situations); soothability; and attention span/persistence (Lemery et al. 1999, Rothbart & Bates 1998).

In the last decade, adult personality researchers have moved toward increasing consensus about the higher-order structure of adult personality. Among the best-established models is the Five-Factor Model, and several three-factor models also have received support (John & Srivastava 1999). Although there are important differences among these various models, they overlap to a considerable degree. Consistent support has been found for the traits of Extraversion/Positive Emotionality, Neuroticism/Negative Emotionality, and Conscientiousness/Constraint, and additionally in the Five-Factor model, Agreeableness and Openness-to-Experience.

Consensus about the structure of adult personality traits has important implications for developmental research: We now have greater clarity about the adult personality traits that developmental studies should be trying to predict over time. Developmental researchers have explored the possibility that childhood personality structure may share important similarities with adult personality structure, and there is now evidence that such is the case, from preschool age through

adolescence. In a number of studies, the Big Five and Big Three traits have been obtained in factor analyses of parent and teacher ratings of children (summarized in Shiner & Caspi 2003), although the evidence for an Openness-to-Experience trait is somewhat weak. Although children exhibit traits that are remarkably similar to those seen in adults, researchers should remain attentive to developmental differences in the manifestations of these traits; for example, the traits may be less coherent earlier in childhood (Lamb et al. 2002). The structure of individual differences from age 2 to 8 years warrants special attention because developmental changes during this period are rapid and wide-ranging.

A Developmental Taxonomy of Higher- and Lower-Order Traits

Although there is increasing consensus about the structure of personality at the level of higher-order, broad traits, there is little consensus about the lower-order traits subsumed within those superfactors (John & Srivastava 1999). The broad traits (e.g., extraversion) represent the most general dimensions of individual differences in personality; at successively lower levels are more specific traits (e.g., sociability, dominance) that, in turn, are composed of more specific responses (e.g., talkative, good at leading others). Personality research most frequently focuses on higher-order traits, but the lower-order traits may provide better prediction of behavioral outcomes (Paunonen & Ashton 2001). Below we provide a synopsis of recent work on the Big Five traits and their potential lower-order components in both children and adults. Developmental research provides a particularly rich source of information about the lower-order traits because these traits have been studied using a variety of methods, including observational studies and lab studies, in addition to the questionnaire studies that are more typical in adult personality research (Shiner 1998).

EXTRAVERSION/POSITIVE EMOTIONALITY Children and adults vary in their tendencies to be vigorously, actively, and surgently involved with the world around them. Extraverted individuals are outgoing, expressive, energetic, and dominant, whereas introverted individuals are quiet, inhibited, lethargic, and more content to follow others' lead. What is the core feature of this trait? Recent theoretical and empirical work with adults has pinpointed three possible central features: the tendency to experience frequent positive moods (Fleeson et al. 2002), sensitivity to potential rewards (Lucas et al. 2000), and the tendency to evoke and enjoy social attention (Ashton et al. 2002). A complementary biological perspective suggests that Extraversion derives from a biological system promoting active approach and exploration of the environment (Depue & Collins 1999).

Extraversion/Positive Emotionality (PEM) encompasses at least four lower-order traits: social inhibition or shyness, sociability, dominance, and energy/activity level. Social inhibition or shyness reflects reluctance to act and feelings of discomfort in social encounters. Social inhibition can be identified as an individual

difference from early in childhood and is predicted by earlier physiological and behavioral reactivity (Kagan 1998). By middle childhood, shyness is distinguishable from sociability, the preference to be with others rather than alone and to seek close relationships. Sociability may primarily tap elements of approach and positive emotionality, whereas shyness may be a more multidimensional trait combining elements of low approach, high negative emotionality, and high behavioral avoidance (Nigg 2000). A third component of extraversion is dominance, the tendency to be assertive and confident, to exert control over others, and to capture and enjoy others' attention (Hawley 1999). Observed social status and dominance are related to extraversion in adults (and to low neuroticism in males; Anderson et al. 2001) and to well-being and positive emotions in chimpanzees (Weiss et al. 2002). Energy and activity level are aspects of extraversion that are easily observed among children (Rothbart et al. 2001); although adults are less motorically active, extraverted adults still manifest higher levels of energy. A high level of positive activity is typically associated with extraversion, but it is important to recognize that activity level may be related in some cases to impulsivity and poor behavioral control in young children.

NEUROTICISM/NEGATIVE EMOTIONALITY Just as children and adults vary in their predisposition toward positive emotions, they vary in their susceptibility to negative emotions (Rothbart et al. 2001, Watson 2000). All temperament and personality taxonomies include a trait that encompasses the tendency to experience the world as distressing or threatening. Children and adults who are high on Neuroticism/Negative Emotionality (NEM) are anxious, vulnerable to stress, guilt-prone, lacking in confidence, moody, angry, easily frustrated, and insecure in relationships; individuals low on this trait are emotionally stable and adaptable. Neuroticism is one of the most widely studied traits in the entire field of psychology. Even more may be known about this trait than previously recognized, in light of new evidence that Neuroticism may be part of an underlying dimension that includes self-esteem, locus of control, and generalized self-efficacy (Judge et al. 2002). A number of researchers have suggested that some aspects of this trait may be rooted in a biological system aimed at helping guard against potentially threatening or harmful situations (Rothbart et al. 2000, Watson et al. 1999).

Neuroticism/NEM includes both anxious (or fearful) distress and irritable distress (Rothbart & Bates 1998, Shiner & Caspi 2003). These two separate dimensions of distress proneness are evident already in infancy. Anxious distress is inner-focused and, by childhood, includes tendencies toward anxiety, sadness, insecurity, and guilt. Big Five Neuroticism typically emphasizes this component. In contrast, irritable distress taps outer-directed hostility, anger, jealousy, frustration, and irritation; in children, such hostile distress is often evoked by limits set by adults. The distinction between inner-directed and outer-directed distress is similar to the distinction between internalizing and externalizing psychiatric disorders. Because anxious distress and irritable distress are likely to follow different developmental paths and predict different outcomes, these two lower-order traits should

be investigated separately in many instances. In fact, international lexical studies of adult personality have provided evidence that these two aspects of distress proneness often appear on different factors (Peabody & DeRaad 2002, Saucier & Goldberg 2001).

CONSCIENTIOUSNESS/CONSTRAINT Children and adults vary widely in their capacities for behavioral and cognitive control. Conscientious individuals are responsible, attentive, careful, persistent, orderly, and planful; those low on this trait are irresponsible, unreliable, careless, and distractible. Individual differences in control may be related to biological differences in executive attentional systems that develop across early childhood and the early school years (Posner & Rothbart 2000). In fact, the ability to focus attention in infancy predicts control later in childhood (Kochanska et al. 2000), and adult capacity for effortful attention is associated with Big Five Conscientiousness (Rothbart et al. 2000).

An ongoing debate about the nature of individual differences in self-control involves the question of how the high end of this trait should be conceptualized. High Conscientiousness has been variously seen as willingness to follow authority and conform to group norms (Hogan & Ones 1997) or as positive "engagement within task-related endeavours" (Ashton & Lee 2001, p. 346). Is it possible to be too constrained or inhibited, as Block & Block (1980) argued, or is high Conscientiousness a marker for positive strength of will? Further work is needed to clarify the underlying nature of this trait.

Conscientiousness/Constraint includes at least six lower-order traits: self-control versus behavioral impulsivity, attention, achievement motivation, orderliness, responsibility, and conventionality. Self-control ranges from the tendency to be planful, cautious, and behaviorally controlled to the tendency to be incautious, careless (or carefree), and impulsive (Halverson et al. 2003, Kochanska et al. 2000). Attention taps the capacity to regulate attention by shifting mental sets, focusing attention, and persisting at tasks in the face of distraction. Although this trait is not prominent in adult personality models, it is an important trait in most temperament models in children (Shiner 1998). Individual differences in this trait are measured by many neuropsychological tests requiring a high level of focus (Nigg 2000). It is not clear why attention is not included in most adult personality models; perhaps differences in attention become subsumed under inhibitory control with age. Achievement motivation taps the tendency to strive for high standards and to pursue goals over time in a persistent, determined manner (Halverson et al. 2003). There is some evidence from lexical studies with adults that this trait may be a blend of high Conscientiousness and high Extraversion/Positive Emotionality (Peabody & De Raad 2002). Orderliness reflects a propensity to be neat, clean, and organized versus sloppy and disorderly (Roberts et al. 2004a). It forms the empirical core of most factor-analytically derived models of conscientiousness. Responsibility reflects a blend of conscientiousness and agreeableness and ranges from the tendency to be reliable and dependable to being undependable (Roberts et al. 2004a). Consistent with its conceptual overlap with psychopathy, this domain

subsumes some of the strongest predictors of delinquency (Roberts et al. 2004b). Finally, conventionality taps the tendency to uphold traditions and societal norms and serves as one of the strongest predictors of avoiding risky behaviors such as excessive drug and alcohol consumption (Bogg & Roberts 2004).

AGREEABLENESS Agreeableness includes a variety of traits that foster congenial relationships with others (Graziano & Eisenberg 1997). Agreeable individuals are cooperative, considerate, empathic, generous, polite, and kind. Disagreeable individuals are aggressive, rude, spiteful, stubborn, cynical, and manipulative. In studies with both children and adults, Agreeableness also includes a willingness to accommodate others' wishes. Agreeableness is linked with Neuroticism/NEM in that both traits measure aspects of anger proneness; however, Agreeableness taps the poor control of anger expressed through aggression, whereas Neuroticism/NEM taps individuals' experiences of angry emotions (Martin et al. 2000). Agreeableness is also linked with Conscientiousness/Constraint, in that both traits tap aspects of inhibition versus disinhibition (Clark & Watson 1999). There may be good developmental reasons that Agreeableness is associated with both Neuroticism and Conscientiousness: Negative emotionality, self-control, and attention in childhood are all important predictors of later Agreeableness (Eisenberg et al. 2000, Laursen et al. 2002, Rubin et al. 2003).

The two poles of Agreeableness—antagonism and prosocial tendencies—have been examined separately as distinct traits in many studies of children and adults. Antagonism ranges from the tendency to be peaceful and gentle to the tendency to be aggressive and hostile. By childhood, individuals differ significantly in their levels of physical aggression (Tremblay 2000) and relational aggression, which includes gossiping and social exclusion (Crick et al. 2001). Children also differ markedly in their levels of prosocial behavior, including their tendencies to be helpful, kind, considerate, generous, empathic, and nurturant (Eisenberg & Fabes 1998). Although antisocial and prosocial tendencies tend to covary negatively, they are not necessarily opposite ends of a single dimension (Graziano & Eisenberg 1997). Support for this view comes from research pointing to etiological distinctions between antisocial and prosocial behavior (Krueger et al. 2001): Whereas genetic influences account for a significant amount of the variance in antisocial tendencies, shared, family-wide environmental experiences also account for a significant amount of the variance in altruism. A third lower-order trait, cynicism/alienation, has been identified in adults and may be related to both Neuroticism/NEM and Agreeableness (Martin et al. 2000); this trait taps an individual's tendency to mistrust others and to feel mistreated. A similar individual difference indexing alienation has been identified in research on social-information processing in youths (Crick & Dodge 1994).

OPENNESS-TO-EXPERIENCE/INTELLECT Openness-to-Experience/Intellect is the most debated and least understood of the Big Five traits, yet it includes a number of potentially important traits (McCrae & Costa 1997). Openness (imaginative,

creative, and aesthetically sensitive) and Intellect (quick to learn, clever, insightful) have each been proposed to be the core of this trait (John & Srivastava 1999); each of these traits may be a separate subcomponent of the higher-order trait. The two component traits can be measured in children as young as age 3 (Halverson et al. 2003), but in a number of studies with children and adolescents the higher-order trait is measured less reliably than the other Big Five traits (Shiner 1998). Openness-to-Experience/Intellect does not appear in temperament models, despite the fact that parents often use words from this domain of individual differences to describe their children (Mervielde et al. 1998). The developmental precursors of this trait are also unknown, but there is preliminary evidence for two possible temperamental bases. First, the tendency to seek stimulation and to explore new environments actively in early childhood predicts later academic achievement and IQ (Raine et al. 2002); these behaviors may also predict later Openness/Intellect. Second, orienting sensitivity, which includes the tendency to be sensitive to internal and external sensory stimulation, is concurrently related to Openness in adulthood (Rothbart et al. 2000).

Directions for Future Developmental Work on Personality Structure

We suggest six ways to build on the current success of elucidating the structure of personality differences across the life course. First, much more work is needed to specify lower-order traits that can be identified in children and adults. There are a number of lower-order traits beyond the ones specified here that may turn out to be important; e.g., humility and integrity (Agreeableness), and talent (Openness). It may also be possible to distinguish among different negative emotions making up the Neuroticism/Negative Emotionality trait (e.g., sadness, anxiety, and fear).

Second, we have emphasized advances in dimensional, or variable-centered, approaches to personality classification. These approaches are concerned with systematizing the enormous differences between individuals. In contrast, approaches that are typological, or person-centered, aim to develop a taxonomy not of personality variables but of personality types, and are concerned with the overall structure of personality dimensions within individuals. Efforts to classify people rather than variables are still in their early stages of development, although there appear to be striking regularities in the identification of at least three "types" of children: resilient, overcontrolled, and undercontrolled (Hart et al. 2003). However, the descriptive and predictive efficiency and utility of typological versus dimensional approaches awaits more explicit evaluation (Asendorpf 2003).

Third, more creative measurement of individual differences, beyond the sole use of questionnaires, would benefit the fields of child development and personality psychology. For example, implicit measures have been used to assess anxiety and shyness in adults (Asendorpf et al. 2002, Egloff & Schmukle 2002); rather than directly inquiring about a person's self-view of personality, these instruments

measure indirectly an individual's automatic associations between trait descriptors and the self. Physiological measures can parse groups of individuals into more homogeneous subtypes (Kagan et al. 2002). Puppet interviews have been used to assess self-views of traits in children as young as age 4 and could be used to measure a wide range of traits early in childhood (Measelle et al. 1998).

Fourth, more research is needed about the cross-cultural generalizability of the taxonomic system reviewed here for children and adolescents. Cross-cultural studies of adult personality structure have been pursued vigorously over the past decade (Church 2001), but children have been left out of these studies. We do know that parents from the United States, China, and several European countries consider the Big Five traits to be important in describing their children (Kohnstamm et al. 1998), but we know little about the structure of youths' individual differences in countries outside the United States and Europe. We also know little about when in the life course mean-level cross-cultural differences in personality emerge.

Fifth, it will be important to chart the development of sex differences in mean levels of personality traits. Although there do not appear to be any sex differences in the structure of personality, there are some differences in the mean levels of personality traits (Costa et al. 2001). A deeper understanding of the causes of such sex differences will be important for explaining both personality development and the development of psychopathology (Rutter et al. 2003).

Sixth, we concur with Funder's (2001) conclusion that more data are needed about how personality traits are expressed through behavior in context. To achieve such understanding will require casting a wider nomological net that includes more detailed measurements of social, cognitive, and emotional processes. First, observational studies (of behavior and affect) can be applied to study how traits are manifest in different social relationships across the life course. Second, although social-cognitive and trait approaches to personality are often portrayed as antagonistic, they are perfectly complementary and mutually informative. By integrating social-cognitive constructs (e.g., mental representations, encoding processes) into research on traits, developmentalists can advance understanding of how traits are differently manifested at different ages. Third, the union of differential psychology and neuroscience may increasingly lead the way to a better understanding of personality differences in brain functions (Canli et al. 2001).

THE ORIGINS OF INDIVIDUAL DIFFERENCES IN PERSONALITY: CONTRIBUTIONS FROM BEHAVIORAL GENETICS

Behavioral genetics is no longer an exotic research enterprise. In fact, large, worldwide registers of data on twins and their relatives are making it possible to advance understanding of both genetic and environmental influences on personality functioning across the life course (Boomsma et al. 2002).

New Directions in Behavioral Genetic Studies of Personality

Behavioral genetics research has uncovered increasingly reliable and robust evidence that genetic factors substantially influence personality traits. Bouchard & Loehlin (2001) provide a comprehensive review of this research, pointing to heritability estimates across the Big Five factors in the range of 0.50 ± 0.10. There are some fluctuations from study to study, but, in general (*a*) all five superfactors appear to be influenced by genetic factors to the same extent, and (*b*) genetic and environmental factors also affect individual differences in men's and women's personalities to the same extent.

Several novel findings in behavioral genetics research on personality merit mention. First, measures of personality that incorporate multiple viewpoints or perspectives (e.g., by consolidating information from multiple reporters or across multiple situations) yield larger estimates of genetic influences (as well as smaller, but more reliable, estimates of nonshared environmental influences) than measures based on a single viewpoint (e.g., Arseneault et al. 2003, Phillips & Matheny 1997, Reimann et al. 1997). This finding has been uncovered in studies of young children, adolescents, and adults. It has been suggested that "consensus trait measures," which eliminate specificities or idiosyncrasies in different viewpoints about a person, could be used to better identify both specific genes and specific experiences that are correlated with personality (Bouchard & Loehlin 2001).

Second, behavioral genetic studies have been used to examine whether there is etiological differentiation within the narrow facets (or lower-order, primary traits) that make up broader personality superfactors (such as the Big Five). The question is whether higher-order dimensions, or superfactors, represent the best level of analysis for research in genetics. Analyses at the lower-order or primary-trait levels of the personality hierarchy offer additional, useful information about the origins of individual differences in personality. For example, analyses at the primary-trait level suggest that siblings resemble each other in their altruism and prosocial behavior (facets of Agreeableness) in part because of the rearing environments they share (Jang et al. 1998, Krueger et al. 2001), but analyses of the Agreeableness superfactor (which includes many other facets) may conceal this shared environmental influence. Earlier we noted that, for behavioral prediction, it is often a shortsighted strategy to rely exclusively on measures of broad superfactors. Likewise, such exclusive reliance may limit research into the etiology of personality differences.

Third, quantitative genetic studies are widely seen as a necessary preliminary to identifying heritable phenotypes that can be usefully examined at the molecular genetic level (Martin et al. 1997). Carey (2003) provides a valuable introduction to methods and concepts in molecular genetics, and Plomin & Caspi (1999) discuss how personality researchers can use genes once they have been identified. But the problem has been to identify specific genes responsible for the genetic influence on personality. A recent meta-analysis of studies reporting data on associations between candidate genes and personality traits concluded there were few replicable associations (Munafo et al. 2003). Much of the initial excitement about research

on molecular genetics and personality has given way to a more sober appreciation of the pitfalls (Benjamin et al. 2002).

The search for genes for personality is difficult because, unlike classical single-gene disorders in which a single gene is necessary and sufficient to produce the disorder, there is no evidence for such major effects of genes for personality. For complex quantitative traits like personality, genetic influence is much more likely to involve multiple genes of varying but small effect sizes. Design (e.g., sample size), sampling (e.g., ethnic stratification), and measurement shortcomings are usually invoked to explain inconsistencies in results from studies of gene mapping and personality. It is also likely that genes do not directly encode for personality traits. In fact, it is now recognized that the heritability coefficient indexes not only the direct effects of genes but also effects of interactions between genes and environments (Rutter & Silberg 2002). Gene-environment interactions (GxE) occur when the effect on a person of exposure to a particular environment is conditional upon their genotype (or conversely, when environmental experiences moderate gene expression). Because interactions are independent of main effects, it is possible that even genome-wide scans of very large numbers of people whose personalities are carefully measured will fail to detect genes whose effects are conditional on environmental risk. Two studies suggest the possibility that some complex traits, instead of resulting from many genes of small effect, result from relatively fewer genes whose effects are conditional on exposure to environmental risk. The first study showed that maltreated children whose genotype conferred low levels of monoamine oxidase A (MAOA) expression more often developed conduct disorder, antisocial personality, or violence than children with a high-activity MAOA genotype (Caspi et al. 2002). The second study showed that individuals with one or two copies of the short allele of the 5-HTT promoter polymorphism exhibited more depressive symptoms, diagnosable depression, and suicidality following stressful life events than individuals homozygous for the long allele (Caspi et al. 2003). If replicated, and if more GxE are found to influence related phenotypes, this may improve methodology in genetics by focusing attention on theory-guided studies of candidate genes in the context of environmental risks. Measured genotypes and measured environments will increasingly be brought together to understand the processes by which they eventuate in personality phenotypes.

Behavioral Genetics in the Postgenomic Era: Opportunities for Advancing Psychosocial Research on Personality Development

Will quantitative genetic studies become obsolete in the postgenomic era? No. They will continue to play an important role in research on personality development, for at least four reasons.

First, quantitative genetic studies are ideally suited for identifying true environmental influences on personality development. During the 1990s, the assumption that "nurture" influences personality development came under fire. Traditional socialization studies, which could not separate environmental influences on personality development from their correlated genetic influences, were challenged by

four empirical discoveries: (*a*) ostensible environmental measures are influenced by genetic factors (Plomin & Bergeman 1991); (*b*) parents' heritable traits influence the environments they provide for their children (Plomin 1994); (*c*) children's genetically influenced behavior affects how their parents rear them (Ge et al. 1996, O'Connor et al. 1998); and (*d*) for many personality measures, environmental influences do not seem to account for the similarity among persons growing up in the same family (Rowe 1994). Although nonbehavioral-genetic studies showed that certain rearing experiences were correlated with certain child outcomes, theories of causation based on findings from such designs were guilty of a fundamental logical error: mistaking correlation for causation (Scarr 1992).

These challenges culminated in the assertion that children's family environments and children's developing psychological traits both arise from common genetic influences (Harris 1998). Some social scientists responded thoughtfully to this claim (e.g., Collins et al. 2000), but many also missed the point. The reason there is controversy in the first place about the importance of the family environment for personality development is that the data are not good enough to support anyone's claims. To be more precise: The data are sufficiently ambiguous to support everyone's claims. The responsible way to tackle the genetic challenge to socialization research is head on, by using genetically sensitive designs that can provide leverage in identifying environmental risks.

Research designs that are able to disentangle genetic and environmental influences on behavior are characterized by two key features. First, they require studying multiple family members, not simply one person from each family. Second, the proportion of genes (and environments) shared among family members is known and can therefore be modeled. Twin and adoption studies are clearly suited to this type of environmental research, but so too are other large-scale research projects, such as the National Longitudinal Survey of Youth (Rodgers et al. 1994) and the Add Health Study (Duncan et al. 2001), that contain information about genetically related individuals in their samples. Environmentally informative genetic designs offer "strong" and "fair" tests of the effect of nurture on personality development. Such designs offer strong tests of the nurture hypothesis in that they use genetically informative samples to control for and disentangle genetic influences. The tests are fair in that behavioral geneticists are increasingly incorporating state-of-the-art measurements of the environment into their research. To date, several genetic designs have been used to identify environmentally mediated effects of neighborhood/school (Cleveland 2003, Rose et al. 2003), family structure (Jaffee et al. 2003), and parenting (Jaffee et al. 2004) variables on children's and adolescents' personalities and behavioral problems.

A second way in which quantitative genetic studies are proving generative is that they are being harnessed to better understand why children growing up in the same family are so different. Indeed, a striking finding from quantitative genetics is not that the environment does not matter, but that what environmental experiences tend to do is to create differences between children growing up in the same family (Plomin 1994). Progress in identifying specific experiences that make

genetically related children different from each other has been slow (Turkheimer & Waldron 2000), leading one reviewer to offer the "gloomy prospect" that psychosocial researchers may never identify the systematic sources of differences between children growing up in the same family because these differences are most likely created by stochastic developmental processes (Turkheimer 2000). This is probably an overstatement, as increasingly stronger and unambiguous designs as well as improved measurement strategies are being used to identify specific environmental causes of personality differences between children growing up in the same family (Caspi et al. 2004, Reiss et al. 2000).

Third, quantitative genetic studies of personality are increasingly used to ask questions about causal mechanisms (Rutter et al. 2001). This is partly in response to evidence that genetic factors influence people's environments; i.e., measures that assess putative environmental experiences are saturated by genetic variance. Genetic influences have been identified on multiple aspects of the child-rearing environment (e.g., Wade & Kendler 2000) as well as on extrafamilial, peer environments beyond the family (Iervolino et al. 2002). A key issue for personality researchers is the extent to which personality contributes to genetic influences on measures of the environment. So far, genetic effects on the Big Five personality traits have been reported to explain genetic influences on life events (Saudino et al. 1997), and personality traits account for more than 30% of the genetic influence on divorce risk (Jockin et al. 1996). The main implication from these results is that associations between environmental measures and personality cannot be assumed to be caused environmentally, and in some instances the likely direction of effects is the other way around: Individuals are sometimes differentially exposed to environments (e.g., divorce) as a result of their genetically influenced personality traits.

Fourth, although it is often said disparagingly that behavioral genetics is a-developmental, recent findings in three different areas of research demonstrate that behavioral genetic methods are ideal for application to questions about age-related changes in etiology, in relation to both normal and abnormal development. First, longitudinal research on cognitive development shows that the heritability of IQ increases from early childhood through late adolescence (Plomin et al. 1997). In this instance, one can think of a heritability estimate as an outcome variable. When it changes with age, this suggests that the balance of genetic versus environmental causal processes differs at successive developmental stages. In the case of IQ, the findings suggest that the effect on IQ of environmental factors shared by siblings dissipates with age, as each child increasingly seeks out environments that are correlated with their genetic endowments. Second, research on the development of drug dependence suggests that the causes of initiation and of dependence are not identical, and that the factors that lead adolescents to sample drugs are not necessarily the same factors that lead to drug dependence (Kendler et al. 1999). Third, research in developmental psychopathology suggests that the pattern of antisocial behavior that begins early in life, is pervasive across settings, and persists into adulthood is associated with relatively higher heritability estimates than is the pattern of late-onset, situational, transient delinquency (Taylor et al. 2000). In

combination, these three sets of findings illustrate how quantitative genetic studies can play an important role in illuminating developmental processes.

PATTERNS OF CONTINUITY AND CHANGE IN PERSONALITY TRAITS FROM CHILDHOOD TO OLD AGE

Personality traits are thought, by definition, to reflect stable individual differences. But what does the longitudinal evidence actually show? When does personality stabilize, and is there room for continued change throughout development? This section is divided into three parts. First, we review evidence about the differential or rank-order stability of personality across time. Second, we review evidence about mean-level changes in personality over time. Third, we summarize three principles that appear to govern personality development in adulthood.

Differential Continuity and Change

Continuity and change are most often indexed by correlations between personality scores across two points in time (i.e., test-retest correlations). These differential or rank-order stability correlations reflect the degree to which the relative ordering of individuals on a given trait is maintained over time. Two contradictory predictions have been proposed about the rank-order stability of personality traits. The classical trait perspective argues that personality traits in adulthood are biologically based "temperaments" that are not susceptible to the influence of the environment and thus do not change over time (McCrae et al. 2000). From this "essentialist" perspective, we would expect the test-retest correlations to be high, even early in life. In contrast, the radical contextual perspective emphasizes the importance of life changes and role transitions in personality development and suggests that personality should be fluid, prone to change, and yield low test-retest correlation coefficients, especially during developmental periods characterized by rapid physical, cognitive, and social changes (Lewis 2001).

Existing longitudinal studies do not support either of these positions. A meta-analysis of the rank-order stability of personality (organized according to the Five-Factor Model) revealed six major conclusions (Fraley & Roberts 2004, Roberts & DelVecchio 2000): Test-retest correlations over time (*a*) are moderate in magnitude, even from childhood to early adulthood. Furthermore, rank-order stability (*b*) increases with age. Test-retest correlations (unadjusted for measurement error) increased from 0.41 in childhood to 0.55 at age 30, and then reached a plateau around 0.70 between ages 50 and 70. Rank-order stability (*c*) decreases as the time interval between observations increases, and does not vary markedly (*d*) across the Big Five traits nor (*e*) according to assessment method (i.e., self-reports, observer ratings, and projective tests), or (*f*) by gender.

Several observations can be drawn from this meta-analysis. First, the magnitude of rank-order stability, although not as high as the "essentialists" would claim, is still remarkably high. The only psychological constructs more consistent than

personality traits are measures of cognitive ability (Conley 1984). Second, the level of continuity in childhood and adolescence is much higher than originally expected (Lewis 2001), especially after age 3. Even more impressive is the fact that the level of stability increases in a relatively linear fashion through adolescence and young adulthood. Young adulthood has been described as demographically dense, in that it involves more life-changing roles and identity decisions than any other period in the life course (Arnett 2000). Yet, despite these dramatic contextual changes, personality differences remain remarkably consistent during this period. Third, personality continuity in adulthood peaks later than expected. According to one prominent perspective, personality traits are essentially fixed and unchanging after age 30 (McCrae & Costa 1994). However, the meta-analytic findings show that rank-order stability peaks some time after age 50, but at a level well below unity. Thus, personality traits continue to change throughout adulthood, but only modestly after age 50. Finally, the levels of consistency found in this recent meta-analysis replicated smaller studies dating back to the early part of the twentieth century. There have been few if any cohort shifts in the level of rank-order stability in personality traits in recent history.

Mean-Level Continuity and Change

Mean-level change refers to changes in the average trait level of a population. This type of change is thought to result from maturational or historical processes shared by a population, and is typically assessed by mean-level differences in specific traits over time, which indicate whether the sample as a whole is increasing or decreasing on a trait.

Contradictory perspectives—similar to those guiding predictions about differential stability—have also guided expectations about mean-level changes in personality traits. Proponents of the Five-Factor Model of personality argue that personality traits do not demonstrate mean-level changes after adulthood is reached (Costa & McCrae 1997) and that, if they do, the change is attributable to genetic factors (McCrae et al. 2000). In contrast, proponents of a life-span developmental perspective emphasize the importance of life changes and role transitions in personality development and suggest that mean-level changes do occur and often at ages much later than young adulthood (Helson et al. 2002).

A recent review synthesized and organized (according to the Five-Factor Model) data from over 80 longitudinal studies spanning the period from age 10 to 101 (Roberts et al. 2003). The pattern of change in the first domain of the Big Five, Extraversion, was complex until this superfactor was divided into constituent elements of dominance and sociability. Traits associated with dominance increased from adolescence through early middle age, whereas traits associated with sociability increased in adolescence and then showed decreases in young adulthood and old age. Consistent with evidence from cross-sectional comparisons of different age groups (McCrae et al. 2000), traits belonging to the domains of Agreeableness and Conscientiousness increased in young adulthood and middle age. Traits belonging to the domain of Neuroticism decreased mostly in young adulthood.

Finally, traits from the Openness-to-Experience domain showed increases in adolescence and young adulthood and a tendency to decrease in old age.

Three aspects of these findings deserve note. First, there are no discernible sex differences in patterns of mean-level continuity and change across the Big Five. Apparently, men and women change in the same ways over the life course, although mean-level differences between the sexes are maintained over time. This suggests that the causes of personality continuity and change across the life course are likely to be the same for the sexes. Second, the majority of personality change occurs in young adulthood, not in adolescence as one might suspect given traditional theories of psychological development. This pattern of change is not simply a recent historical phenomenon, as it was observed in different cohorts across the twentieth century. This finding suggests that the causes of normative personality change are likely to be identified by narrowing research attention to the study of young adulthood. Third, for select trait categories, change occurs well past young adulthood, demonstrating the continued plasticity of personality well beyond typical age markers of maturity. On the whole, the evidence offers support for a life-span developmental view of mean-level changes in personality traits.

The evidence base about continuity and change still has several important gaps. First, the best data about personality continuity and change—and hence the most reliable conclusions—continue to be restricted to adult samples. Relatively few studies have used a comprehensive set of personality variables to characterize young children and to track continuities and changes in their personalities over time. Second, relatively little is known about ethnic differences in personality continuity and change, due to the underrepresentation of ethnic minority groups in many longitudinal studies. A third methodological weakness is that many longitudinal studies continue to estimate continuity and change over only two waves of assessment, despite the advent of new methodological approaches that are appropriate for answering more nuanced questions about both short- and long-term temporal dynamics (Biesanz et al. 2003). Finally, and most importantly, the next generation of studies should move beyond description and attempt to explain patterns of continuity and change (Mroczek & Spiro 2003).

Principles of Personality Development in Adulthood

The empirical results of longitudinal studies allow us to infer a number of principles about personality development, from adolescence through adult life (Roberts & Wood 2004). We highlight three of these principles as guiding hypotheses and syntheses of extant findings.

THE MATURITY PRINCIPLE Most people become more dominant, agreeable, conscientious, and emotionally stable over the course of their lives. These changes point to increasing psychological maturity over development, from adolescence to middle age. Two distinct definitions of maturity prevail in developmental theories (Hogan & Roberts 2004). The first, humanistic definition equates maturity with

self-actualization and personal growth, with the process of becoming less defensive and rigid and more creative and open to feelings. The data do not support this developmental progression; people do not grow increasingly open to experience toward old age; after young adulthood, they actually exhibit declines on traits related to Openness-to-Experience (Small et al. 2003). The second, functional definition equates maturity with the capacity to become a productive and involved contributor to society, with the process of becoming more planful, deliberate, and decisive, but also more considerate and charitable (traits encompassed by higher levels of Emotional Stability, Conscientiousness, and Agreeableness). According to the longitudinal data, most people do appear to become more functionally mature with age, and those who develop the cardinal traits of psychological maturity earliest are more effective in their love, work, and health (as reviewed in the final section of this chapter).

CUMULATIVE CONTINUITY PRINCIPLE As noted above, the relative consistency of personality traits continues to increase throughout the life span, peaking perhaps at age 60, and even then not being quite fixed (Roberts & DelVecchio 2000). Four factors contribute to the inevitable stabilization of personality that comes with age.

First, longitudinal data on twins suggest that much of the stability in adult personality is attributable to genetic factors (e.g., McGue et al. 1993). This does not mean that genes "fix" personality, but rather that genetic factors contribute to the preservation of individual differences over long stretches of the life span, at least from adolescence onward. A possible interpretation of these findings is the set-point model (Carey 2003), which argues that environmental fluctuations may produce short-term changes in personality phenotypes, but that genetic factors contribute to individual set points to which individuals will "regress" (Lykken & Tellegen 1996). Longitudinal data with multiple, repeated measurements—over both short and long intervals—are needed to fully test the predictions derived from the model.

Second, personality traits are implicated in niche-building processes that promote continuity. Niche building encompasses at least three different processes whereby people (*a*) create, (*b*) seek out, or (*c*) end up in environments that are correlated with their traits. Once in a trait-correlated environment, the environment may have causal effects of its own, promoting the persistence of trait-correlated behaviors and cutting off opportunities for change. More detailed data are needed about the nature of these processes across time (e.g., Roberts & Robins 2004).

A third, related factor that facilitates increasing personality consistency with age is the process of developing, committing to, and maintaining an identity (Roberts & Caspi 2003). Identity development facilitates personality consistency by providing clear reference points for making life decisions. Strong identities serve as a filter for life experiences and lead individuals to interpret new events in ways that are consistent with their identities. Likewise, to the extent that a person's identity becomes known to others in the form of a reputation, it leads others to treat the person in ways that are consistent with his or her personality (Roberts & Wood

2004). Future research should integrate indices of identity strength and clarity into longitudinal designs to better test the long-term consequences of identity structure on personality development.

Fourth, normative-developmental changes in personality may contribute to increasing personality continuity across the life course. Traits associated with the domains of Agreeableness, Conscientiousness, and Emotional Stability not only increase with age (see the Maturity Principle), they are also positively correlated with increased personality consistency; that is, people who are interpersonally effective, planful, decisive, and considerate are less likely to change (e.g., Roberts et al. 2001). Although there is no obvious explanation for this replicated finding, one possibility is that Agreeable, Conscientious, and Stable people are better equipped to deal with social-developmental challenges across the life course. They have more personal capital in the form of increased resilience that allows them to master more efficiently the life challenges that they face and to recuperate more quickly from aversive and disappointing life events that they encounter. In contrast, their more brittle counterparts may be more susceptible to the influence of their environment. The robust finding that some people are more prone to change than others calls for research that systematically tests reasons for it.

THE CORRESPONSIVE PRINCIPLE Personality trait development is not a continuity-versus-change proposition. Rather, continuity and change coexist due to the corresponsive principle, which summarizes the empirical observation that the most likely effect of life experience on personality development is to deepen the characteristics that lead people to those experiences in the first place (Roberts et al. 2003, Roberts & Robins 2004). For example, if people assume more leadership positions because they are more dominant, then they will become more dominant through their experience as leaders. The corresponsive principle links two mutually supportive life-course dynamics: "social selection," wherein people select environments that are correlated with their personality traits, and "social influence," wherein environmental experiences affect personality functioning. According to longitudinal data, the traits that "select" people into specific experiences are the traits that are most "influenced" in response to those experiences (e.g., the personality trait of dominance selects people into jobs that involve resource power, and employment in such jobs further increases dominance). That is, life experiences do not impinge themselves on people in a random fashion causing widespread personality transformations; rather, the traits that people already possess are changed (i.e., deepened and elaborated) by trait-correlated experiences that they create.

PERSONALITY EFFECTS ON SOCIAL DEVELOPMENT

Two events have served to make research on personality trait development more vibrant. First, developmental psychologists have begun to measure personality traits, rather than ignore them. Second, personality psychologists have become

increasingly interested in relating measures of personality traits to something besides other personality measures. The result is robust evidence that early-emerging individual differences in personality shape how individuals experience, interpret, and respond to the developmental tasks they face across the life course. In this final section, we review longitudinal evidence about how personality traits shape (*a*) the cultivation of social relationships, (*b*) the mastery of educational and work tasks, and (*c*) the promotion and maintenance of health. For each developmental task, we identify the most relevant personality variables and outline the mechanisms by which these personality traits are hypothesized to exert their influence.

Cultivating Relationships: Friendships, Intimate Relationships, and Parenting

One of the most important tasks faced by children and adolescents is the establishment of friendships and acceptance among peers (Hartup & Stevens 1999, Masten & Coatsworth 1998). Among children, all of the higher-order personality traits described previously are important predictors of social competence. Perhaps so many aspects of personality predict social competence because social functioning requires a wide array of skills, including emotional expression, emotional understanding, and emotional and behavioral regulation (Denham 1998, Rubin et al. 1998). Agreeable and Extraverted children are more socially competent concurrently and across time (Asendorpf & van Aken 2003, Gest 1997, Shiner 2000). Children high on Negative Emotionality or low on Constraint have a variety of social difficulties concurrently and across time; the interaction of these traits may be especially problematic for social functioning (Eisenberg et al. 2000).

Personality continues to be an important predictor of relationships in adulthood. Neuroticism and Agreeableness are the strongest and most consistent personality predictors of relationship outcomes—including relationship dissatisfaction, conflict, abuse, and, ultimately dissolution (Karney & Bradbury 1995). These effects have been uncovered in long-term studies following samples of children into adulthood, as well as in shorter-term longitudinal studies of adults. The potential contribution of stable personality differences to shaping abusive relationships has been further underscored by longitudinal studies that find associations between early developing aggressive traits in childhood and subsequent abusive behavior in adult romantic relationships (Ehrensaft et al. 2004). One study that followed a large sample of adolescents across their multiple relationships in early adulthood discovered that the influence of Negative Emotionality on relationship quality showed cross-relationship generalization; that is, it predicted the same relationship experiences across relationships with different partners (Robins et al. 2002). Increasingly sophisticated studies that include dyads (not just individuals) and multiple methods (not just self reports) demonstrate that the link between personality traits and relationship processes is more than simply an artifact of shared method variance in the assessment of these two domains (Donnellan et al. 2004, Watson et al. 2000).

An important research goal is to uncover the proximal relationship-specific processes that mediate these personality effects (Reiss et al. 2002). Personality traits affect relationships by influencing and altering microinteractional processes. First, individuals *select* their interactional contexts by choosing partners who resemble them. The tendency to form unions with similar others has implications for the course of personality development because similarities between couple members create interpersonal experiences that reinforce initial tendencies (Caspi & Herbener 1990). Second, personality differences influence people's *exposure* to relationship events. For example, people high in Negative Emotionality are more likely to be exposed to daily conflicts in their relationships (Bolger & Zuckerman 1995). Third, personality differences shape people's reactions to the behavior of their partners. For example, people who are more Neurotic are more likely to escalate negative affect during conflict (e.g., Gottman et al. 1998). Similarly, high Agreeable people are better able to regulate emotions during interpersonal conflicts (Jensen-Campbell & Graziano 2001). Cognitive processes also come on-line in creating trait-correlated experiences (Snyder & Stukas 1999). Trait-correlated anticipatory attitudes lead individuals to project particular interpretations onto new social relationships, and individuals transfer trait-correlated affective responses developed in the context of previous relationships to new relationships (Andersen & Chen 2002). Fourth, personality differences evoke behaviors from partners that contribute to relationship quality. For example, people high in Neuroticism and low in Agreeableness are prone to express four behaviors identified as detrimental to relationships: criticism, contempt, defensiveness, and stonewalling (Gottman 1994).

Whereas a great deal of research has investigated the influence of personality on friendships and intimate relationships, fewer studies have considered the possibility that parents' personalities shape their parenting styles and relationships with their children. This is a curious omission because parental personality forms a critical part of children's developmental context (Goldsmith et al. 1994). Moreover, behavioral genetic studies show that some parenting behaviors are heritable (Spinath & O'Connor 2003). This does not mean, of course, that there is a gene for parenting styles. What it does suggest is that individual differences in parenting behaviors may be related to personality characteristics that are strongly influenced by genetic factors. The handful of studies that have examined personality/parenting associations—using self-reports as well as observations of parenting—suggest that Positive Emotionality and Agreeableness are related to sensitive and responsive parenting, whereas aspects of Neuroticism, such as anxiety and irritability, are related to less competent parenting (Belsky & Barends 2002). Much more work needs to be done. First, most of the research to date has focused on parents of very young children to the virtual exclusion of adolescents. Second, most of the research has not tested mediators (e.g., parental attributions) of observed personality/parenting associations. Third, most of the research has focused on the main effects of personality and has not addressed the conditions under which particular personality attributes are more or less important in explaining parenting behavior

(e.g., are personality main effects moderated by qualities of the marital relationship or by the child's temperament?). Fourth, to our knowledge, no study has examined personality effects on parenting behavior in relation to multiple children in the same family, a design that has the power to test the cross-situational generalizability of personality effects (across offspring) and to estimate the influence of parental personality on family life independently of other family-wide environmental effects.

The study of personality effects on social relationships is exciting territory where hypotheses about personality dynamics can be tested using multiple and creative methodologies. These approaches need not be confined to close relationships. Bugenthal (2000) proposed a taxonomy of social relations that offers the promise of helping to coordinate personality research by focusing attention on how personality variables shape behaviors in five domains of social life: attachment relations, mating relations, hierarchical power relations between persons of unequal status, reciprocal relations among persons of equal status, and coalitional-group relations.

Striving and Achieving

Across the life course, individuals assume multiple performance tasks (e.g., pursuing an education, assuming a job, managing and allocating resources). Personality traits from the domain of Conscientiousness/Constraint are the most important noncognitive predictors of educational achievement, occupational attainment, and subsequent job performance (Judge et al. 1999). Conscientiousness encompasses many traits that are necessary for completing work effectively: the capacities to sustain attention, to strive toward high standards, and to inhibit impulsive behavior. In fact, childhood Conscientiousness predicts improvements in academic achievement across time into adulthood (Shiner 2000, Shiner et al. 2003). Additional evidence suggests that childhood traits from the Positive Emotionality and Agreeableness domains predict adolescent academic performance (Shiner 2000); aspects of these same higher-order traits also predict adult job performance criteria in a more limited set of occupational groups (Mount et al. 1998). Openness-to-Experience and Intellect likewise correlate with academic achievement in samples of school-age children and young adolescents (Graziano et al. 1997). Predictive associations between temperament and personality traits and achievement are apparent already early in life, at the time that children first enroll in school (Miech et al. 2001). Research with children, adolescents, and adults also demonstrates that the links between personality traits and various indices of achievement remain significant after controlling for individual differences in ability (Judge et al. 1999, Shiner 2000, Shiner et al. 2003).

The finding that personality effects on achievement emerge early in life is important, because school adjustment and academic performance have cumulative effects over time. The personality processes involved may vary across different stages of development, and at least four candidate processes deserve research

scrutiny (Schneider et al. 1998). First, the personality/achievement associations may reflect "attraction" effects, or "active niche-picking," whereby people actively choose educational and work experiences whose qualities are concordant with their own personalities. For example, people who are more conscientious prefer conventional jobs, such as accounting and farming (Gottfredson et al. 1993). People who are more extraverted prefer jobs that are described as social or enterprising, such as teaching or business management (Ackerman & Heggestad 1997). Moreover, extraverted individuals are more likely to assume leadership roles in multiple settings (Anderson et al. 2001).

Second, personality/achievement associations reflect "recruitment" effects, whereby people are selected into achievement situations based on their personality characteristics. These recruitment effects begin to appear surprisingly early in development. For example, children's personalities influence their emerging relationships with teachers already at a young age (Birch & Ladd 1998). In adulthood, job applicants who are more extraverted, conscientious, and less neurotic are liked better by interviewers and are more often recommended for the job (Cook et al. 2000).

Third, some personality/achievement associations emerge as consequences of "attrition" or "deselection pressures," whereby people leave achievement settings (e.g., schools or jobs) that do not fit with their personality or are released from these settings because of their trait-correlated behaviors (Caspi et al. 1998).

Fourth, personality/achievement associations emerge as a result of direct, proximal effects of personality on performance. To date, most research has centered on the relation between Conscientiousness and productive job performance (Barrick & Mount 1991). In addition, increasing evidence suggests that Positive Emotionality facilitates the efficient processing of complex information and is associated with creative problem solving (Ashby et al. 1999). More recent research shows that, in fact, all of the Big Five have substantial relations with better performance when the personality predictor is appropriately aligned with work criteria (Hogan & Holland 2003). This indicates that if people find jobs that fit with their dispositions they will experience greater levels of job performance, which should lead to greater success, tenure, and satisfaction across the life course (Judge et al. 1999).

Health Promotion and Maintenance

Perhaps the most dramatic findings about personality development come from life-span studies that document links between personality traits and longevity: Individuals who score high on traits of Positive Emotionality and Conscientiousness/Constraint live longer (Danner et al. 2001, Friedman et al. 1995). Other research documents that individuals high in traits related to Disagreeableness (e.g., anger and hostility) are at greatest risk of disease (e.g., cardiovascular illness) (Miller et al. 1996). The evidence for the involvement of Negative Emotionality/Neuroticism in ill health is more mixed, with the some research pointing to

links with increased risk of actual disease and other studies documenting links with illness behavior only (Smith & Spiro 2002).

Personality/health associations may reflect at least three distinct processes (Contrada et al. 1999, Rozanski et al. 1999). First, personality differences may be related to pathogenesis, mechanisms that promote disease. This has been evaluated most directly in studies relating various facets of Disagreeableness/Hostility to greater reactivity in response to stressful experiences (Smith & Gallo 2001). However, part of the complexity of testing hypotheses about the role of personality in the physiological processes of a disease involves the need for greater clarity about the disease processes involved and the phases during which personality effects may be implicated.

Second, personality differences may be related to physical health outcomes because they are associated with health-promoting or health-damaging behaviors. For example, individuals high in Positive Emotionality may foster social relationships, social support, and social integration, which are positively associated with health outcomes (Berkman et al. 2000). In contrast, individual low in Conscientiousness engage in a variety of health-risk behaviors such as smoking, unhealthy eating habits, lack of exercise, unprotected sexual intercourse, and dangerous driving habits (Bogg & Roberts 2004). The association between Constraint/Conscientiousness-related traits and health-risk behaviors is especially robust and appears to be stronger among adolescents than adults, which suggests that this "risky" personality trait merits greater research and public health attention. Future personality research could be usefully integrated with developmental research from a decision-theory perspective to better understand the decision-making processes that may mediate the links between traits from the Conscientiousness domain and health-risk behaviors (Hampson et al. 2000).

Third, personality differences may be related to reactions to illness. This includes a wide class of behaviors, including the possibility that personality differences affect the selection and execution of coping behaviors (e.g., Scheier & Carver 1993), modulate distress reduction, and shape treatment adherence (Kenford et al. 2002). The aforementioned processes linking personality traits to physical health are not mutually exclusive. Moreover, different personality traits may affect physical health via different processes. For example, facets of Disagreeableness may be most directly linked to disease processes, facets of low Conscientiousness may be more clearly implicated in health-damaging behaviors, and facets of Neuroticism may contribute to ill health by shaping reactions to illness.

The study of personality and health has historically been confined to adults. However, this may well change as health psychologists turn their attention to earlier periods in development in order to understand enduring research and public health puzzles. Consider research on social inequalities in health, which has tended to focus on low socioeconomic status in adulthood as the main causal variable and on adults' stress experiences as the main mediating mechanism. However, mounting evidence from life-course research points to the contribution of early life experiences and to the cumulative impact of sustained social disadvantages on

adult health, compelling health psychologists to turn their attention to examine the role that personality factors may play in mediating the associations between early social experiences and poor health across the life course (Gallo & Mathews 2003, Repetti et al. 2002).

SUMMARY

We have summarized four areas of research about personality development where advances, and even some new discoveries, have been made. In some instances, new research has resolved long-standing debates and, in other instances, it has generated new ideas and hypotheses. Advances in measurement (personality structure), methodology (analysis of temporal dynamics), and technology (genetics and brain imaging) will continue to fuel exploration and understanding of the origins and developmental course of individual differences in personality.

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