

## CHAPTER 14

# The Development of Personality Traits in Adulthood

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**P**ersonality traits are defined as the relatively enduring patterns of thoughts, feelings, and behaviors that distinguish individuals from one another. The crux of personality trait development lies in one's interpretation of the two words "relatively enduring." For many years, the implicit assumption was that traits were "enduring enough" to ignore the issue of development. Recently, more nuanced developmental questions about traits have arisen because a critical mass of longitudinal studies showed that personality traits do change. These more nuanced questions center on both continuity and change and are the focus of this chapter.

Our first section addresses the basic question, what do we mean by *continuity* and *change*? In the context of defining what is meant by continuity and change, we also review the findings related to each type of continuity and/or change. Then we attempt to answer three related questions. First, why are personality traits consistent? Second, why do personality traits change, especially in adulthood? And, third, why don't personality traits change more than they do? Along the way, we point out major principles that we have derived from the body of empirical and theoretical work on personality development (Table 14.1) and mechanisms that we believe to be responsible for both continuity

and change in personality (Tables 14.2 and 14.3).

### TYPES OF CONTINUITY AND CHANGE OBSERVED IN LONGITUDINAL RESEARCH

The assertion that an individual's personality has changed or remained the same over time is ambiguous. Likewise the claim that personality traits are both consistent and changeable is seemingly contradictory. A further ambiguity arises when a claim of continuity or change rests on observations not of an individual but of a sample of individuals. The continuity or change of an attribute at the group level may be partially independent of changes at the individual level. Moreover, different forms of continuity and change, either at the sample or individual level, may be entirely independent of one another, making it not only possible but inevitable that there is both continuity and change in personality traits. There are, in short, a number of meanings denoted by the terms "continuity" and "change." The purpose of this section is to disentangle some of those meanings.

First we discuss the main statistical approaches to studying continuity and change in longitudinal research and then touch on one conceptual definition of change that does

TABLE 14.1. Principles of Personality Development

<i>Cumulative continuity principle:</i>	Personality traits increase in rank-order consistency throughout the lifespan.
<i>Maturity principle:</i>	People become more socially dominant, agreeable, conscientious, and emotionally stable with age.
<i>Plasticity principle:</i>	Personality traits are open systems that can be influenced by the environment at any age.
<i>Role continuity principle:</i>	Consistent roles rather than consistent environments are the cause of continuity in personality over time.
<i>Identity development principle:</i>	With age, the process of developing, committing to, and maintaining an identity leads to greater personality consistency.
<i>Social investment principle:</i>	Investing in social institutions, such as age-graded social roles, outside of the self is one of the driving mechanisms of personality development, in general, and greater maturity, in particular.
<i>Corresponsive principle:</i>	The effect of life experience on personality development is to deepen the characteristics that lead people to those experiences in the first place.

not correspond strongly with any particular statistic. Figure 14.1 provides a schematic of the different types of statistical change. At the foundation is structural continuity, which refers to the persistence of correlational patterns among a set of variables over time or across age groups. Typically, structural continuity is evaluated using either exploratory or confirmatory factor analysis. It is the foundation of any research on continuity and change because establishing structural continuity is the first step that should be taken in all such investigations, regardless of whether the focus is the development of personality traits or other constructs (Baltes, Reese, & Nesselroade, 1977). Structural continuity is important because it establishes whether the same construct is being measured at different time points or ages (Little, 1997). Tracking the remaining types of continuity and change in a construct without first establishing structural continuity is, by definition, a pointless endeavor.

The remaining types of development can be organized nicely in a two-by-two table, with the organizing dimensions being whether the development of a characteristic is examined at the individual or population level, and whether the focus is on absolute or relative standing on the dimension. The population-level examination of relative ranking of individuals is often referred to as “rank-order stability.” We prefer “rank-order consistency,” largely because the term “stability” denotes an absence of change, which may be

misleading. The population-level examination of absolute change is described as mean-level change, which tracks whether samples or populations as a whole increase, decrease, or remain the same on their average score over time and age. At the individual level, the analogue to rank-order consistency is ipsative consistency. The latter tracks the relative ordering of constructs within an individual over time and age. Finally, change examined at the level of the individual in absolute terms is often referred to as “intra-individual differences in individual change” (Nesselroade, 1991), which we typically shorten to “individual differences in change.” Individual differences in change capture each person’s unique pattern of increasing, decreasing, or not changing at all on any given dimension.

In the following sections we go into more detail about each type of continuity/

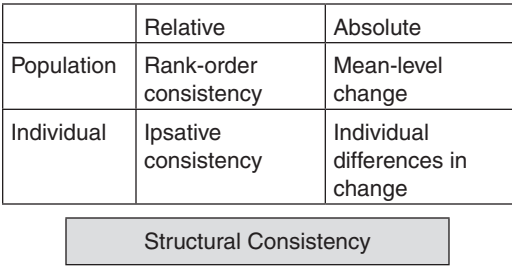


FIGURE 14.1. Organizational scheme for the basic indices of continuity and change.

change, the evidence for each, and some of the ancillary questions related to each concept. We close this section with a discussion of one type of conceptual change that is not strongly associated with a specific statistic: heterotypic continuity.

### ***Structural Continuity/Change***

At the time of our last review (Caspi & Roberts, 1999), there was a surprising lack of evidence either *for* or *against* the structural continuity of personality across time and age. Since 1999, examining the structural continuity of personality has become much more common. First, the Big Five structure tends to emerge in late childhood and become clarified in adolescence (Allik, Laidra, Realo, & Pullman, 2004; Lamb, Chuang, Wessels, Broberg, & Hwang, 2002). For example, the Big Five appear to emerge out of early childhood temperament dimensions, such as inhibition (Deal, Halverson, Havill, & Martin, 2005). Presumably, then, if a child was rated on a Big Five measure in childhood, the scores among the five would correlate more highly, because these dimensions have yet to fully differentiate from one another. It is possible that with age, the personality of young children, which is relatively undifferentiated, may become more complex both because of cognitive changes and because children acquire a larger set of roles and identities as they age (Block, 1982).

From late adolescence through late middle age, the evidence for the structural continuity of personality traits appears to be strong, with most studies showing little if any serious changes in the factor structure of the Big Five across time or age groups (e.g., Allemand, Zimprich, & Hertzog, 2007; Costa & McCrae, 1992; Robins, Fraley, Roberts, & Trzesniewski, 2001). The same appears to be true of personality structure in old age, though there are some studies that raise questions concerning the comparability of personality structure in old age to young adulthood (Mroczek, Ozer, Spiro, & Kaiser, 1998). Therefore it remains unclear whether the structure of personality traits remains consistent in old age and old-old age (e.g., over 80).

One interesting question that remains to be investigated is whether personality traits become less differentiated, like cogni-

tive abilities, in old age (Baltes, Lindenberger, & Staudinger, 2006). Facets of cognitive ability show signs of becoming more highly correlated in old age (e.g., Deary, Whiteman, Star, Whalley, & Fox, 2004). This de-differentiation is thought to result from a decrease in the integrity of the physiological systems related to cognitive ability, which reduces the specificity of particular skills. A similar idea could be tested with personality traits, for example, by examining whether the higher-order structure of the Big Five, in which the five traits are captured by two dimensions of alpha and beta (Digman, 1997), becomes clearer with age.

The second way in which differentiation may occur is not captured by existing statistical methods. This form of differentiation entails adding new behaviors into one's repertoire for a trait, or more knowledge about existing behaviors. For example, representations of the self become more complex with age (Labouvie-Vief, Chiodo, Goguen, & Diehl, 1995). This added complexity means that more underlying nodes and facets of personality traits develop with time. That is, people may become more sophisticated consumers of their own personality, knowing when and with whom they are outgoing or shy, and in what situations they feel comfortable or anxious. This elaboration of personality may serve as a buffer to global change, as people become more attuned to specific aspects of their personality and determine that change in one relationship or context will not affect the larger network of thoughts, feelings, and behaviors tied to a personality trait. Unfortunately, this type of change has been ignored by most researchers because typical approaches to personality assessment use measures that do not change in content over time.

### ***Rank-Order Consistency/Change***

Since the earliest reviews of rank-order consistency, researchers have reported the same two findings: Personality traits demonstrate moderate to high rank-order consistency (e.g., correlations between .4 and .6) over reasonably long periods of time (e.g., 4–10 years), and the longer one tracks rank-order consistency, the lower it gets (e.g., Fraley & Roberts, 2005). Four reviews/meta-analyses on the topic (Ardelt, 2000; Bazana & Stel-

mack, 2004; Roberts & DelVecchio, 2000; Schuerger, Zarrella, & Hotz, 1989) have come to similar conclusions, with some elaborations and caveats. Specifically, rank-order consistency increases with age and does not appear to plateau until after age 50. Moreover, rank-order consistency does not vary markedly across the Big Five traits, assessment method (i.e., self-reports, observer ratings, and projective tests), or gender.

Several conclusions can be drawn from these reviews and meta-analyses. First, the magnitude of rank-order consistency, although not perfectly “stable,” is still remarkably high, especially within windows of 3–10 years. Second, the level of rank-order consistency in childhood and adolescence is much higher than originally expected, especially after age 3. Even more impressive is the fact that the level of rank-order consistency increases in a relatively linear fashion through adolescence and young adulthood. Adolescence is stereotypically considered a time of storm and stress. In turn, young adulthood is the most demographically dense period of the life course, because it involves more life-changing roles and identity decisions than any other period (Arnett, 2000). Yet, despite these dramatic contextual changes, personality traits show no marked decline in rank-order consistency during this time period. Third, rank-order consistency peaks later in adulthood 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 consistency peaks some time after age 50, and at a level well below unity. Finally, the levels of consistency found in recent meta-analyses replicated smaller studies dating back over a half century (e.g., Crook, 1941). Apparently, there have been few, if any, cohort shifts in the level of rank-order stability in personality traits over the past 60 years.

Although personality traits show some degree of change at all ages, they also demonstrate a clear pattern of increasing continuity across the life course. We describe this as the *cumulative continuity principle* (see Table 14.1). People demonstrate higher levels of rank-order consistency with age across all personality traits (Roberts & DelVecchio, 2000). We believe that people exhibit this pattern of increasing continuity throughout

the life course for several reasons, including gene–environment correlations and the processes surrounding identity development (see section below on why personality is consistent).

One of the most interesting secondary questions about differential continuity is whether it exists across long periods of time. This question can be further refined into two critical questions for personality psychology: (1) Does childhood personality predict adult personality, reflecting the twin maxims of the “child is the father to the man” and “give me a child at 7 and I will show you the adult”?; and (2) Is there truly long-term continuity in personality across the vast expanse of adulthood—that is, is the 20-year-old recognizable in the 70-year old?

There is increasing evidence that child temperament can predict a broad range of outcomes much later in the individual’s life, but at relatively modest levels of predictive validity. In one of the first studies to examine the continuity of child personality into adulthood (Caspi & Silva, 1995), temperament measured at age 3 predicted personality trait measures collected at age 18. Relative to children categorized as “well-adjusted,” children who were categorized as “undercontrolled” at age 3 were found, at age 18, to score higher on aggression, alienation, and stress reaction (similar to neuroticism) and lower on self-control and harm avoidance. Children who were categorized as “inhibited” typically scored higher on harm avoidance and lower on aggression and social potency. All of these effects were approximately in the range of .2–.4 standard deviations—thus small, but not negligible, effects. These differences were largely replicated without any noticeable decrease in magnitude when the same participants were resurveyed at age 26 (Caspi et al., 2003). Similar relationships have been found between infant and adult attachment styles, with classifications of attachment made in the first year of life showing a meta-analytic estimate of  $r = .27$  in their ability to predict adult attachment styles (Fraleigh, 2002).

Personality assessed in later childhood (around the period of 6–12 years) also shows moderate relations with adult personality and life outcomes. In one study, childhood activity and inhibition level, as rated by teachers, showed moderate associations ( $r_s > .30$ ) with self-reported or parent-reported

Big Five dimensions assessed at about age 18 (Deal et al., 2005). Personality traits assessed in children at ages 8–10 (by self-report, or teacher or parent reports) have also been found to correlate moderately ( $r_s \approx .20$ ) with comparable personality dimensions assessed in middle age (Hampson & Goldberg, 2006; Laursen, Pulkkinen, & Adams, 2002; Shiner, Masten, & Roberts, 2003).

The important message here is that the behavioral patterns observed in early childhood are linked to personality traits in adulthood. The significance of this link lies in how much importance one places on small or modest effect sizes (e.g., correlations between .1 and .3). It should be remembered that the typical assessment of childhood temperament is made by parents or teachers, and the typical adult assessment is a self-report. This methodological heterogeneity results in more inherent sources of unreliability than those generally used to assess personality in adulthood (wherein the same person generally completes the same questionnaire on two occasions) and consequently should make the finding of *any* longitudinal relationship all the more impressive. On the other hand, long-term rank-order consistency of analogous constructs, such as intelligence, is much higher from childhood to old age (Deary et al., 2004). The question of whether childhood behavioral tendencies have anything to say about adult personality should be considered solved: They do. The question becomes not so much *whether* we are able to forecast adult behavior from childhood, but what the modest effect sizes mean in terms of practical and theoretical significance (Fraleigh & Roberts, 2005).

The findings on the long-term rank-order consistency of personality traits in adulthood parallel the findings from childhood to adulthood: The continuity over decades, rather than years, is quite modest. For example, the test–retest correlation in a 50-year longitudinal study of architects ranged from 0 to above .5, with the modal correlation hovering around .2–.4 (Feist & Barron, 2003). The average long-term consistency (e.g., 40 years) of neuroticism averages about .2 (Fraleigh & Roberts, 2005). The fact that consistency is not zero is conceptually interesting, but such a weak correlation means that we might not recognize the 70-year-old from what we knew when he or she was 20. There has been

little or no discussion of why personality trait consistency diminishes to this level or what types of changes occur over that long of a period. We should assume that there are substantive personality changes occurring across a lifetime, and some effort should be made to investigate what these changes are and why they come about.

### ***Mean-Level Change***

“Mean-level change” refers to changes in the quantity or amount of an attribute over time in a sample or population of individuals. Changes in mean levels of personality traits were recently examined in a meta-analysis of 92 different longitudinal studies (Roberts, Walton, & Viechtbauer, 2006). Across these studies, it was found that people became more socially dominant (a facet of extraversion), especially in young adulthood, and they became more conscientious and emotionally stable through midlife. Although much of the change on agreeableness was positive, the increase was only statistically significant in old age. Finally, individuals demonstrated gains in social vitality (a second facet of extraversion) and openness to experience in adolescence and then equivalent declines in old age for both of these trait domains. Many of these patterns are also discernible in cross-sectional studies (Labouvie-Vief, Diehl, Tarnowski, & Shen, 2000; Srivastava, John, Gosling, & Potter, 2003).

Much like the meta-analyses of longitudinal consistency (e.g., Roberts & DelVecchio, 2000), several conspicuous factors did not affect patterns of mean-level change across the life course. First, men and women did not differ in their patterns of mean-level change in personality traits. Although reliable sex differences exist on several personality trait dimensions (Feingold, 1994), it appears that there are few reliable sex differences in the way these traits develop over time.

Interestingly, like rank-order consistency, time was related to change in mean levels. Longitudinal studies that followed participants for a longer period of time reported larger mean-level change estimates. The positive association between time and mean-level change is important for theoretical models of human nature. A common assumption is that personality traits act like metabolic set-



points. People may stray briefly from their biological propensity, but they will then drift back to their genetically driven setpoint. Under these types of models, one would expect to find a negative or null association between time and mean-level change because any change would represent short-term fluctuations that disappear as people return to their biologically driven setpoint. However, time is positively associated with personality trait change, which indicates that a strong setpoint model does not apply to personality trait development. That is, when people change, then tend to retain the changes in personality traits for long periods of time.

We also found that cohort standing was related to differential patterns of mean-level change. Younger cohorts had larger standardized mean-level changes in terms of social dominance. The changes in social dominance were consistent with the cross-sectional patterns that indicate that younger cohorts are more assertive (e.g., Twenge, 2001). In addition, a curvilinear relationship was found between cohort standing and both agreeableness and conscientiousness. This pattern indicated that studies focusing on samples from the 1950s and 1960s tended not to increase as much as samples from before and after this period of the 20th century, a pattern first identified by Helson, Jones, and Kwan (2002). These cohort findings point to the importance both of social context and the more inclusive social climate or culture of the people living in a particular period of history. Presumably, social climate affects the way roles are enacted and the behaviors rewarded in those roles, which then affect personality trait development.

We describe the general pattern of personality trait change as the *maturity principle* (Table 14.1) because it corresponds quite closely to definitions of maturity that are functional in nature (Roberts & Wood, 2006). Functional or social maturity is characterized by those qualities that serve to facilitate functioning in society—mature people are more liked, respected, and admired in their communities, social groups, and interpersonal relationships (Hogan & Roberts, 2004). This definition is quite similar to Allport's (1961) characterization of the mature person as happy, showing fewer traces of neurotic and abnormal tendencies, and having the capacity for warm and com-

passionate relationships. From this perspective, maturity is marked by higher levels of emotional stability, conscientiousness, and agreeableness. Research suggests that people do become more mature with age, increasing in assertiveness, self-control, responsibility, and emotional stability, especially between the ages of 20 and 40.

Several other features of the Roberts and colleagues (2006) meta-analysis are important to point out. Most of the patterns of change were heterogeneous and the effect sizes were small for studies tracking development for periods of less than 6 years. Heterogeneity in effect sizes indicates that there is significant variability in the effects across studies. Pragmatically speaking, this means that in some situations, longitudinal studies would find patterns that largely replicate the meta-analysis (e.g., Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006; Donnellan, Conger, & Burzette, 2007), whereas in other situations apparently contradictory findings will emerge (e.g., Watson & Humrichouse, 2006). This is to be expected when heterogeneity combines with small effect sizes, especially in short-term studies. On the other hand, the potential long-term patterns of personality trait change were larger, indicating that studies that follow or track individuals for longer periods of time will reap more compelling evidence for or against the average patterns discovered through meta-analytic aggregation.

Another glaring omission identified in the meta-analytic review is a distinct lack of multimethod research on mean-level change in personality over time. Unlike the evidence for rank-order consistency, we cannot say with confidence that the patterns of mean-level change will replicate across method. This omission was highlighted in a recent longitudinal study of newlywed couples (Watson & Humrichouse, 2006), which found that many personality traits thought to increase in young adulthood, such as agreeableness and conscientiousness, actually decreased over time when assessed by observers. Of course, in this case the observer was a spouse and the sample was drawn from newlyweds, which leads to the inevitable conclusion that the decreases were the result of the honeymoon effect, in which spouses viewed each other through "rose-colored glasses" when they were first married and only came to re-

alize that their spouse was less than perfect after spending a few years with them. Nonetheless, this study highlights the interesting findings that may emerge when researchers move beyond mono-method studies of personality trait development.

### ***Ipsative Continuity***

Structural, differential, and mean-level continuities are indexed by statistics that characterize a sample of individuals. However, continuity at the group level may not mirror continuity at the individual level. For this reason, some researchers examine “ipsative continuity,” which refers to continuity in the configuration of variables within an individual across time.

In Block’s seminal work, described in *Lives through Time* (1971), he analyzed ipsative continuity using the California Q-sort. Block’s analysis showed that aggregate indices of continuity mask large individual differences in personality continuity. For example, the average-ipsative correlation between early and late adolescence exceeded .70, but the intraindividual Q-correlations ranged from moderately negative to the maximum imposed by measurement error. Other studies of personality continuity and change between childhood and adolescence report average ipsative correlations ranging from .43 to .71, with considerable variability in the distribution of these scores (from −.44 to .92), indicating that from childhood to adolescence people vary widely in how much ipsative continuity or change they exhibit (Asendorpf & van Aken, 1991; Ozer & Gjerde, 1989). Recent studies have reported similar levels of average ipsative consistency. In a 3-year longitudinal study of children and adolescence, the average profile correlation within individuals across a Big Five measure was above .8 (De Fruyt, Bartels, et al., 2006). Slightly lower levels of ipsative consistency across Big Five measures and the (MPQ) have been found in college students (Robins et al., 2001) and young adults (Donnellan et al., 2007; Roberts, Caspi, & Moffitt, 2001).

Of course, ipsative analyses can be used to study change also. Block (1971) focused on ipsative change in personality by identifying groups of men and women marked by specific patterns of change. More recently,

Morizot and Le Blanc (2003, 2005) replicated and extended these findings in a 36-year longitudinal study of men. In a subsample of men who were not jailed as adolescents, they found four developmental groups: communals (became less neurotic and impulsive with age), agentics (increased on extraversion; decreased on neuroticism and impulsivity), undercontrolled (higher on impulsivity and neuroticism to start), and overcontrolled (no personality change with age; Morizot & Le Blanc, 2005). These four groups partially replicate the developmental groups first identified by Block and show the potential of tracking a full profile of personality traits over time. The broader message of these ipsative studies is that traits can interact with one another to direct the expected pattern of development over time.

Possibly the most interesting work to come out of the ipsative approach is the research showing that higher profile stability is associated with mean levels of personality traits themselves. In an 8-year longitudinal study, men and women who were more controlled, less neurotic, and more prosocially oriented demonstrated less change in personality traits and greater profile consistency across personality traits (Roberts et al., 2001). These findings were largely replicated, using parent ratings of personality in a 10-year longitudinal study of Iowans (Donnellan et al., 2007). Therefore, it appears that once people attain high levels of traits associated with maturity—e.g., emotional stability, agreeableness, and conscientiousness—they keep these qualities in place more readily than people who score lower on these indices. This enhanced stability may be a result of many factors, but most likely these personality traits are reinforced by society in person–environment transactions because they are so often seen as desirable or rewarding by others.

The advantage of these ipsative indices of continuity is that they reflect the continuity of each individual within the sample. This is the type of consistency that most individuals think about when confronted with the question of whether their “personality” has changed. If the overall organization of one’s character remains essentially intact, then changes on individual dimensions may not impact a person’s opinion or perspective on whether his or her personality has changed.

### *Individual Differences in Change*

The phrase “individual differences in change” refers to the gains or losses in absolute levels of a personality trait that each individual experiences over time (Nesselrode, 1991). These are changes that deviate from the population mean-level pattern of change. Historically, personality psychologists have not concerned themselves with individual differences in change and have focused disproportionately on population indices of development (Mroczek & Spiro, 2003). This oversight is puzzling, given the fact that personality psychology as a field prides itself on understanding the individual. What could be more intrinsic to understanding personality development than the ability to account for and understand each individual’s unique pattern of development?

Of course, one important empirical hurdle needs to be surmounted to imbue the study of individual differences in change with any significance. One must overcome the inference that any deviation around the general pattern of change is simply error (Watson, 2004). The most direct way to confront this inference is to test whether there are people who change more than would be expected, given the level of reliability of any given measure. Individual-level change has been the focus of psychotherapy outcome research for years, and so has the issue of whether changes that occur in therapy are real or simply meaningless fluctuations of an unreliable measure (Jacobson & Truax, 1991). In order to bolster the argument that therapy works at the individual level, psychotherapy outcome researchers developed the Reliable Change Index (RCI) to gauge changes in dimensions related to therapeutic intervention. The RCI gauges the amount of change that occurs against the amount of change that could be expected, given the unreliability of the measure. We introduced this index to personality development researchers in two longitudinal studies (Roberts et al., 2001; Robins et al., 2001) that tracked personality development in young adulthood. In both studies, we found that a greater-than-chance proportion of individuals in our samples showed reliable change, suggesting that reliable individual differences in change existed.

The RCI index has now been used widely in longitudinal studies of personality trait

development. Using this index, researchers have replicated the existence of reliable individual differences in change during childhood and adolescence (De Fruyt, Bartels, et al., 2006; Pullman, Raudsepp, & Allik, 2006), young adulthood (Donnellan et al., 2007; Vaidya, Gray, Haig, & Watson, 2002; Watson & Humrichouse, 2006), middle age (Branje, van Lieshout, & van Aken, 2004; van Aken, Denissen, Branje, Dubas, & Goossens, 2006), and old age (Steunenberg, Twisk, Beekman, Deeg, & Kerkhof, 2005).

The use of the RCI has provided unambiguous evidence that individual differences in personality trait change exist and are not attributable to measurement error. On the other hand, the RCI is fundamentally flawed. First, it is grossly conservative. It requires that people move more than two standard errors on a trait in order to categorize them as changing reliably. It is quite possible that smaller changes are important and reliable. Second, it is applicable to studies that track change over two waves of assessment. It is now clear that two-wave longitudinal studies provide unreliable and imprecise assessments of change (Singer & Willett, 2003). The optimal way to track personality change is to gather multiple assessments over time and apply growth-modeling techniques to estimate individual differences in change over time. Using these techniques, researchers have shown that reliable individual differences in personality trait change occur across young adulthood, middle age, and old age (Jones, Livson, & Peskin, 2003; Mroczek & Spiro, 2003; Roberts & Chapman, 2000; Scollon & Diener, 2006; Small, Hertzog, Hultsch, & Dixon, 2003).

The second way of establishing both the existence and the importance of individual differences in personality trait change is to test whether life experiences are associated with changes in personality traits. For example, if people who experience more satisfying work grow happier and more emotionally stable with time, this indicates that not everyone changes in this way and that work experiences may be a causal force for personality trait change. It also provides a potential explanation for why most people might change in a normative fashion, as we discuss below in the section on social investment. We review this material in more detail below in the section on why personality



traits change. Suffice it to say that certain life experiences are associated with distinctive patterns of trait development (Roberts & Mroczek, 2008).

Finally, it should be noted that individual differences in change may be important from a practical standpoint. Studies have shown that modest changes in personality traits can result in profound consequences for health. Specifically, men and women who showed increased levels of hostility experienced increased obesity, inactivity, social isolation, and worse physical health compared to those who did not show increased levels of hostility (Siegler et al., 2003). In the case of neuroticism, men who increased one half of a standard deviation in neuroticism in old age suffered a 32% increase in mortality compared to men who did not change in neuroticism (Mroczek & Spiro, 2007). These studies point to the fact that relatively modest changes in personality traits may have significant consequences for individuals.

### ***Personality Coherence***

The kinds of continuity and change discussed so far refer to statistical indices of continuity and change in identical constructs over time. The concept of coherence enlarges the definition of continuity and change to include “heterotypic continuity,” which entails identifying relations between different sets of behavior across different ages. For instance, individuals who hurt animals as children might engage in more criminal behavior in adulthood. It is important to emphasize that coherence and heterotypic continuity refer to conceptual rather than statistical continuity among behaviors. When relationships are found between different behaviors over time, these heterotypic connections need to be explained by an underlying dispositional attribute that (1) is related to both behaviors at different time points, and (2) shows a sizable degree of rank-order consistency. For instance, hurting animals as children and adult criminal activity might be indicators of underlying, consistent antisocial tendencies. Accordingly, the investigator who claims to have discovered coherence must have a theory—no matter how rudimentary or implicit—that specifies the latent construct or provides the basis on which the diverse be-

haviors and attributes can be said to belong to the same equivalence class.

The argument that coherence requires a theoretical framework and not just a statistic means that heterotypic continuity remains an alluring, if difficult, concept to prove. Research has shown that childhood personality is linked to adult outcomes, which, at first blush, look like heterotypic continuity. Shy children leave their parental home at an older age and delay their assumption of adult social roles, such as marriage and work (Caspi, Elder, & Bem, 1988). Anxious, stress-prone children grow up to become conventional, moralistic conservatives (Block & Block, 2006). Children who are more agreeable grow up to smoke fewer cigarettes in adulthood (Hampson, Goldberg, Vogt, & Dubanoski, 2007). Inhibited children become adults who are seen as more neurotic and less extraverted, agreeable, conscientious, and open to experience (Deal et al., 2005).

Although these examples provide unequivocal evidence linking childhood personality to later adult phenomena, it is unclear whether they are examples of heterotypic continuity. The implicit theory behind these results would be best approximated by trait theory or five-factor theory, which posits that traits are latent temperaments that are unaffected by experience (e.g., McCrae et al., 2000). Invoking this theoretical framework invites skepticism, however. Is conservatism simply a manifestation of neuroticism? The findings connecting childhood inhibition to all of the Big Five pose even more difficulties for a trait model. Clearly, inhibition is linked to all of the Big Five in adulthood. Yet, in adulthood, the Big Five are only modestly correlated, indicating that inhibition must be differentiated into multiple domains that result in the Big Five. Therefore, it would be difficult to conclude that the Big Five exist in temperamental form early in life and progress in an undifferentiated form into adult versions of traits.

As these examples illustrate, the theories behind claims of coherence often amount to appeals to the reader's intuition. Often they are post hoc interpretations of empirical relations discovered in large correlation matrices (Moss & Susman, 1980). With the notable exception of the psychoanalytic theory of psychosexual stages and their adult seque-