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Personality Across the Life Span

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Abstract

Trait stability and maturation are fundamental principles of contemporary personality psychology and have been shown to hold across many cultures. However, it has proven difficult to move beyond these general findings to a detailed account of trait development. There are pervasive and unexplained inconsistencies across studies that may be due to (*a*) insufficient attention to measurement error, (*b*) subtle but age-sensitive differences in alternative measures of the same trait, or (*c*) different perspectives reflected in self-reports and observer ratings. Multiscale, multimethod—and ideally multinational—studies are needed. Several hypotheses have been proposed to account for trait stability and change, but supporting evidence is currently weak or indirect; trait development is a fertile if sometimes frustrating field for theory and research. Beyond traits, there are approaches to personality development that are of interest to students of adult development, and these may be fruitfully addressed from a trait perspective.

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INTRODUCTION

Personality psychology owes a large debt to gerontology. Increasing interest in adult development and aging in the middle of the nineteenth century, coupled with mistrust of cross-sectional comparisons, led to the initiation and maintenance of longitudinal studies—for example, the Baltimore Longitudinal Study of Aging (Shock et al. 1984) and the Boston VA Normative Aging Study (Bell et al. 1972)—intended to trace the life span growth and decline of a host of biomedical and psychosocial variables. Almost incidentally, the longitudinal designs also allowed an evaluation of rank-order stability, which turned out to be crucial to the development of trait psychology.

In the 1970s, in the wake of Mischel's (1968) influential critique, trait psychology was out of fashion, with many psychologists convinced that traits were merely ephemeral attributions. Evidence of high retest stability over periods of many years in several different samples (Block 1981, Leon et al. 1979, Siegler et al. 1979) was therefore eye opening: The old notion of traits as enduring dispositions was suddenly a viable hypothesis again. Although not all psychologists were convinced of the value of traits, the findings of stability were a major incentive to a growing body of research that soon established the structure, heritability, consensual validity, and universality of traits (Costa & McCrae 1992a) and their importance for outcomes across the life span (Ozer & Benet-Martínez 2006).

SCOPE OF THE REVIEW

A glance at any personality textbook shows that personality has a bewildering variety of definitions. Fifty years ago, the study of personality across the life span was concerned with such topics as epigenetic psychosocial stages (Erikson 1950), ego mastery styles (Gutmann 1964), and interiority (Neugarten 1964). Today, most gerontologists and psychologists from many other fields have adopted a view of personality in which traits are a, if not the, core feature. Although variously defined, traits are generally thought to be more-or-less consistent and enduring dispositions manifest in patterns of thoughts, feelings, and behaviors; operationally, they are what standard personality scales measure. Traits are only one component of the personality system, which also includes such elements as needs and motives, attitudes and beliefs, and life narratives. McAdams & Olson (2010) provided a review of the life span development of some of these nontrait elements of personality, and we turn to a small selection of them in the section titled Personality Development Beyond Traits. For the most part, however, we discuss traits.

A good deal is now known about traits. Most are related to one or more of five very broad domains or factors (the Big Five; Goldberg 1990) that define the highest level of the five-factor model (FFM; Digman 1990). The factors are generally known as Neuroticism (versus emotional stability) (N), Extraversion (E), Openness (to experience) (O), Agreeableness (A), and Conscientiousness (C). Each of these is defined by smaller and narrower traits referred to as facets, and these in turn are composed of even narrower traits, or nuances. Most studies of aging examine only the broad factors, but some attention has been paid to facets (Soto et al. 2011) and even to nuances (Mõttus et al. 2017).

Traits are usually assessed by self-reports or informant ratings—methods that are convergent, although not interchangeable (Vazire 2010). Many adjective scales and questionnaires assess the FFM (De Raad & Perugini 2002). Three widely used instruments are the NEO Inventories (McCrae & Costa 2010), the Big Five Inventory (BFI; John et al. 1991), and the Revised HEXACO Personality Inventory (HEXACO-PI-R; Ashton & Lee 2016). The latter has six rather than five factors; it adds an Honesty/Humility factor that the FFM includes within its broader A factor. All three instruments have subscales for facets, although different facets are found in different instruments; all three exist in both self-report and informant-report formats.

There is evidence of continuity in personality from early childhood on (McAdams & Olson 2010), reaching as far back as infancy (Bornstein 2014). However, personality traits are manifest in such radically different forms in early childhood and in adulthood that they cannot be directly compared: One cannot meaningfully ask whether 2-year-olds are more or less open to experience than adults. Assessing individual stability requires the use of the same instruments and data sources, and the instruments used for self-reports in adults are not appropriate for young children. They begin to be useable when children are approximately age 10 (Baker & Victor 2003, Soto et al. 2011); we therefore restrict our consideration of the life span to age 10 and older.

We focus on the current state of theory and research on stability and change in individual differences in personality traits (Roberts & DelVecchio 2000) and their normative developmental curves (Roberts et al. 2006). The empirical literature is predominantly concerned with interindividual developmental patterns, and we do not deal systematically with studies that focus on intraindividual changes (e.g., Mroczek & Spiro 2003). Nor do we consider structural stability (consistency in the pattern of covariation among traits; see Mõttus et al. 2012) or ipsative stability (consistency of the individual personality profile; see Terracciano et al. 2006).

In token repayment of personality's debt to gerontology, we conclude with a consideration of some nontrait personality constructs that are of special interest to students of adult development.

CONTINUITY AND CHANGE IN RANK-ORDER STABILITY AND MEAN LEVELS OF TRAITS

Individual differences in personality traits endure for years, but a detailed characterization of stability raises a number of conceptual and methodological issues that could affect differential or rank-order stability. These include the length of time between trait assessments (retest interval), portion of the life span studied (initial age), reliability of trait measures, and method of assessing traits. There are changes in the mean levels of traits, but they are not always consistent across studies. Inconsistencies may be due to differences in study designs, cultures, instruments, and respondents or informants. In the following sections, we address each of these topics.

Rank-Order Stability

Anyone who imagines that the crisis of replicability plagues the whole of psychology has not looked at the literature on the stability of individual differences. Since the 1970s, hundreds of studies using different instruments, methods, and populations have consistently reported high levels of retest stability for personality traits over intervals of up to 40 years. Cohen's (1988) rule of thumb is that correlations above 0.50 are large; a recent meta-analysis of 243 retest coefficients for personality traits (Anusic & Schimmack 2016) estimated that the average observed value after an interval of 15 years would be approximately 0.60.

Consider two examples. Chopik & Kitayama (2017) examined data from 3,850 US participants initially aged 25 to 75 and retested after 9 years. They assessed personality with 25 adjectives, five for each of the five personality factors. The observed retest correlations were 0.64, 0.70, 0.69, 0.64, and 0.61 for N, E, O, A, and C, respectively. In one of the first longitudinal studies of a non-Western culture, Chopik & Kitayama also analyzed data from 649 Japanese participants initially aged 30 to 79, using a translation of the same adjective scales. The retest interval in the Japanese study was only 4 years, making direct comparisons of the US and Japanese samples awkward. However, the observed retest correlations in the Japanese sample—0.66, 0.74, 0.70, 0.64, and 0.63 for N, E, O, A, and C, respectively—showed a high level of stability in individual differences. The median retest for US participants was 0.64; for Japanese participants, it was 0.66. Ferguson (2010) had concluded that stability was similar across a range of Western cultures, but it would be rash to conclude from this single study of a non-Western culture that the stability of personality traits is universal. However, given the universality of other features of personality (Allik et al. 2013), it would not be surprising if it were.

We know much more than the mere fact that individual differences are stable. Caspi and colleagues (2005) offered six generalizations about trait stability: It is found across the full life span; it increases with age; it decreases with retest interval; and it is roughly of the same magnitude for different traits, different genders, and different methods of measurement. Nothing in the subsequent literature has seriously challenged any of these generalizations. One might have imagined that newer research would have pinned down the details: At exactly what age does stability peak? Is N slightly more or slightly less stable than E? However, despite considerable research, inconsistencies in the literature have limited such advances.

Retest interval. That stability declines as a function of retest interval has been suspected for some time. If traits are modified by experience, it would be reasonable to assume that the vicissitudes of human life would move individuals' scores in random ways, wandering further and further from initial levels. In Conley's (1984) classic analysis, the stability of intelligence, personality, and self-esteem were compared using an exponential decay model. However, the rates of decay actually seen in most data do not fit this simple model. Costa and colleagues (1980) reported that the mean 6-year retest correlation for 10 Guilford-Zimmerman Temperament Survey (GZTS; Guilford et al. 1976) scales was 0.77, and the mean 12-year retest correlation was 0.73, suggesting only slight decay. A later analysis of GZTS data (Terracciano et al. 2006) analyzed retest interval (of up to 42 years) using a model of exponential decay with a nonzero asymptote—that is, assuming that stability coefficients never fall below some minimal level. That analysis suggested that the long-term stability of GZTS scales was approximately 0.65, and most of the decay occurred within 10 years.

Anusic & Schimmack (2016) applied a similar model to their meta-analysis of personality scales. Their conclusion that long-term stability is approximately 0.60 is consistent with the findings of Terracciano and colleagues (2006), but in Anusic & Schimmack's analysis, most of the decay occurred in the first 3 years. That is a striking finding; if it is correct, then retest interval hardly matters after a few years. The 4-year stability coefficients in Chopik & Kitayama's (2017) Japanese sample would be directly comparable to the 9-year coefficients in their US sample, suggesting equal personality stability in the two cultures.

Initial age. For a given retest interval, stability coefficients generally increase with age. Anusic & Schimmack (2016, p. 774) confirmed this conclusion in their meta-analysis, showing increases in stability "particularly during adolescence and young adulthood." Roberts & Mroczek (2008) have referred to this as the cumulative continuity principle. Borghuis and colleagues (2017) tested this hypothesis in a large Dutch sample of adolescents aged 12 to 22 tested yearly in 6 or 7 waves. For each participant, they calculated a growth curve, a technique that reduces measurement error, and calculated 1-year retest stabilities. These values increased from 0.68 to 0.84 between the ages of 12 and 17, but they showed no increase from 18 to 22. These data might suggest that cumulative continuity pauses (for some reason) in the years from 18 to 22. However, as Anusic & Schimmack (2016) showed, 1-year stability coefficients are inflated estimates of the long-term stability of traits. As a test of cumulative continuity, it might have been more informative to report the 7-year stability coefficients for 12-year-olds, 13-year-olds, and so on.

A continuing controversy concerns the developmental course of stability coefficients after age 30. Costa and colleagues (1980) compared 6- and 12-year stability coefficients for three groups of men with mean ages of 36.7, 51.5, and 67.9 and found no consistent evidence of differential stability for GZTS scales. An analysis of stability of the scales of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae 1992b) also suggested little difference between younger (30–50), middle-aged (50–65), and older (65+) men and women after a retest interval of between 6 and 15 years (Terracciano et al. 2006). The stability coefficient for the E factor was larger for middle-aged respondents ($r = 0.85$) than for older respondents ($r = 0.79$) but did not differ from that of younger respondents ($r = 0.84$). There were no significant differences for N, O, A, or C. Terracciano and colleagues (2010) reported a longitudinal test of this issue by calculating individual stability coefficients for GZTS scales over two successive retest intervals. For respondents initially in their teens and 20s, these stability coefficients increased on the second retest; for respondents in their 30s and older, no changes were seen. Similarly, Schwaba & Bleidorn (2017), who examined individual differences in change trajectories in a large, representative Dutch sample assessed five times over 7 years, found that the largest changes occurred in respondents under age 30. Such findings led to the conclusion that, after approximately age 30, stability coefficients plateau (McCrae & Costa 2003).

By contrast, several studies have suggested that stability has not yet peaked by age 30, but instead continues to increase into the 50s (Roberts & DelVecchio 2000). Furthermore, some studies find evidence that stability declines in old age (Ardelt 2000), such that a plot of personality stability coefficients by age shows an inverted U shape with a peak near age 50 (e.g., Specht et al. 2011). Milojev & Sibley (2014) reported such a pattern for the N, E, O, and C factors, as well as for the Honesty/Humility factor, in a 2-year longitudinal study of New Zealanders. However, most of these studies reported analyses that calculate linear and quadratic functions, whereas Terracciano and colleagues (2010) had proposed a linear spline function, with increases below age 30 and a plateau thereafter.

Figure 1 shows a hypothetical distribution of retest correlations for 2-year age groups, which increase linearly from 0.40 at age 10 to 0.70 at age 30 and thereafter remain unchanged. The figure also plots the best-fitting quadratic equation for these data. The curve suggests that stability continues to increase past age 50 and declines in old age—neither of these trends is the case ex hypothesi. From the data reported, it is not clear whether previous reports of curvilinear

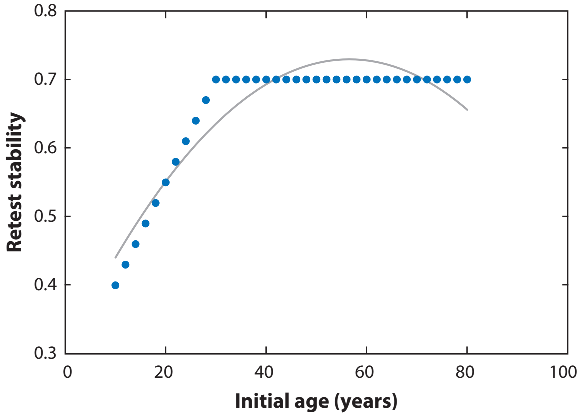

Figure 1

Hypothetical plot of retest stability over a fixed interval as a function of initial age, with a quadratic curve (*gray line*) that best approximates the data. As data points (*blue dots*) show, stability does not vary after age 30, but the quadratic curve incorrectly suggests a subsequent increase and decline in stability.

developmental trends in stability (e.g., Anusic & Schimmack 2016) are real or artifacts of quadratic curve estimates, as illustrated in **Figure 1**. In future studies and meta-analyses, it would be useful to compare the fit of quadratic curves with predictions from a system of piece-wise linear regressions, in which separate estimates of stability coefficients are calculated below and above age 30 (or some empirically determined optimal cutoff point; see Allik et al. 2009). At a minimum, researchers should provide summaries of mean stability coefficients by successive age groups—as did Roberts & DelVecchio (2000, figure 1)—to let readers draw their own conclusions about the shape of the function.

Reliability. Ardelt's (2000) study had the merit of calculating quadratic curves not only for the whole age range, but also separately for samples above and below age 30. She reported that the inverted U shape was also found within the older subsample, suggesting that our **Figure 1** does not accurately depict her data. However, Ferguson (2010) noted that neither Ardelt nor any other previous meta-analysts had controlled for error of measurement. His analysis showed that correcting for unreliability not only raised the magnitude of the stability coefficients (overall, from 0.60 to 0.79), but also affected age trends. For example, when raw retest correlations were examined, respondents aged 28 to 34 showed lower stability ($r = 0.66$) than did respondents aged 35 to 41 ($r = 0.72$). However, the younger cohort showed higher disattenuated stability ($r_{\text{corrected}} = 0.94$) than did the older cohort ($r_{\text{corrected}} = 0.87$). Ferguson (2010, p. 666) concluded that "personality appears to be largely stable beginning in early adulthood, with only modest changes thereafter."

Correction for unreliability is particularly important for meta-analyses that combine stability estimates from many different measures. If, for example, older respondents are given briefer scales than younger respondents, then their lower observed retests may simply reflect the lower reliability of the scales. Correcting for unreliability in this area might seem simple, but it is in fact problematic because there are different ways of assessing reliability. Ferguson (2010) used coefficient α in his analyses because it is the most widely used and reported form of reliability. However, McCrae and colleagues (2011) argued that α was not appropriate for disattenuating stability coefficients and showed that test–retest reliability (r_{tt}) was a better predictor of differential stability than was α. McCrae (2015) offered an explanation for that finding: Stability coefficients reflect not only the stability of the portion of the variance common to the items in a scale (which is assessed by α), but also the stability of variance specific to individual items. In general, this should mean that α is lower than r_{tt}, which seems to be the case for most general personality measures (McCrae et al. 2011). Using α to disattenuate stability coefficients would therefore tend to overcorrect, and because scales differ substantially in the amount of specific variance that they contain (McCrae et al. 2011), this bias is not uniform across scales. Particularly for short scales, where item-specific variance looms large, α and r_{tt} may yield quite different corrections.

The conclusion seems to be that meta-analyses ought to examine retest correlations corrected for test–retest unreliability. Unfortunately, the developers of scales and inventories [including the NEO Inventories prior to the work of McCrae & Costa (2010)] often do not report short-term retest reliabilities. Researchers who are designing longitudinal studies of personality should therefore either select measures for which estimates of retest reliability are available or plan to collect the necessary data themselves, ideally in a representative subset of their longitudinal sample.

Method biases. Caspi and colleagues (2005) noted that estimates of stability are similar across different methods of measurement. That conclusion appears to be correct, but it raises some issues that have not yet been fully addressed. Costa & McCrae (1988) reported the 6-year stability of N, E, and O in both self-reports (rs $=$ 0.83, 0.82, and 0.83, respectively) and spouse ratings (rs $=$ 0.83, 0.77, and 0.80, respectively)—very similar values. Yet the correlations between self-reports and spouse ratings at a given time were substantially lower (initial rs $=$ 0.54, 0.60, and 0.52 for N, E, and O, respectively). The implication is that there is something stable in self-reports that is not shared by spouse ratings, and vice versa. This is method bias, a component of the observed score that is unique to the source (McCrae 2018). Like the trait itself, the individual's idiosyncratic view of the target's standing on the trait appears to be stable over long time intervals.

This raises the possibility that stability coefficients are inflated by method bias. A version of this hypothesis concerns the emergence of a crystallized self-concept. In this scenario, individuals form a reasonably accurate self-concept by early adulthood, which crystallizes into a stable view of their personality held throughout adulthood. Any real personality changes might not be perceived or incorporated into the self-concept. If respondents relied on such crystallized self-concepts when completing self-report personality measures, traits would appear to be stable, even if they had changed radically. At first glance, such concerns appear to be supported by research indicating that, compared to younger adults, older adults report a greater sense of continuity with past and future selves, and that this is associated with higher perceived stability in personality traits (Löckenhoff & Rutt 2017). However, crystallization would also imply that the self-concept should become increasingly inaccurate, and the validity of self-reports should diminish with age. However, self–spouse agreement is as high (or higher) in old couples than in young and middle-aged couples (McCrae & Costa 1982), and older adults' self-reports of past and future characteristics are more accurate than those of younger adults (e.g., Lachman et al. 2008), offering no support for the crystallized self-concept hypothesis.

If multimethod longitudinal data are available, it is possible to estimate the stability of true scores controlling for both random error (retest unreliability) and method bias. Concurrent correlations across observers set an upper limit for predictive correlations across observers, and the ratio of predictive to concurrent correlation is an estimate of true score stability (McCrae 1994). Costa & McCrae (1988) reported that the median concurrent self–spouse correlation for the domains and facets of N, E, and O was 0.50, whereas the median predictive correlation across 6 years was 0.49. The ratio, 0.49/0.50 $=$ 0.98, suggests nearly perfect stability of true scores. More recently, Mõttus and colleagues (2017) used this approach to estimate the stability of personality nuances, operationalized as the 240 individual items of the NEO-PI-R. In a German sample of

400 individuals initially aged 22 to 74, the median observed item stability over a 5-year interval was 0.53; corrected for unreliability and method bias, the median stability was 0.89. Individual differences in personality traits at all levels of the trait hierarchy appear to be fundamentally stable.

Future longitudinal studies of personality should routinely include multimethod assessments of personality. As we discuss below, estimating true score stability is only one of many uses of data from such a design.

Mean-Level Trait Changes

The broadest outlines of normative personality change are clear. Developmental curves are smooth, with no jags suggesting a mid-life crisis or a response to an age-graded life event such as retirement at age 65. At the population level, most change occurs early in life; after age 30, other changes are very gradual and modest. For example, in a sample of over 6,000 US participants aged between 20 and 75, Chopik & Kitayama (2017) reported age correlations of –0.14, –0.01 (*n.s.*), –0.07, 0.08, and 0.03 for N, E, O, A, and C, respectively, illustrating the extremely subtle age effects that an account of adult personality development must reckon with. Although most studies agree that N declines and A and C increase with age, it has proven difficult to move beyond this general statement. Much of the disagreement in detail is due to differences in instruments and in methods of measurement. Differences in research design—cross-sectional, longitudinal, and more complex designs—also create complications.

Because results vary across instruments, we begin with the NEO Inventories (McCrae & Costa 2010), which have been widely used in cross-sectional, longitudinal, cross-cultural, and cross-observer studies of aging. By holding the instrument constant, one can more easily see the effects of design, culture, and method. Studies of the NEO Inventories typically show declines in N and E and increases in A and C from adolescence on. O typically increases in adolescence and declines in adulthood (e.g., McCrae et al. 2005a). These trajectories are consistent with widely held stereotypes of age differences in personality (Chan et al. 2012).

Cross-sectional and longitudinal designs. Gerontologists have been profoundly skeptical of cross-sectional studies, in which effects of aging are confounded with cohort differences—the lingering effects of the different life experiences of successive generations. However, longitudinal studies also have confounds, including attrition, practice effects, and time-of-measurement effects. When cross-sectional and longitudinal results conflict—as in the work of Mueller and colleagues (2016), where E and O declined cross-sectionally but increased longitudinally—interpretation is difficult. Fortunately, the two designs generally agree, especially when longitudinal studies cover long periods of the life span. In studies over shorter intervals, maturational change is so slight that it is easily masked by artifacts.

A study comparing longitudinal and cross-sectional results over a long time span was reported by Terracciano and colleagues (2005). They used hierarchical linear modeling (HLM) to analyze self-reports from 1,944 men and women aged 20 to 96 with one or more assessments over a 15-year period. N declined until age 70; E declined, especially after age 50; O showed a linear decline and A a linear increase across the entire age range; and C increased to age 70 and then declined. All changes were modest in magnitude, amounting to approximately one *T*-score point per decade. Terracciano and colleagues also reported simple cross-sectional analyses of first-administration data: Developmental curves were almost identical to those found in HLM analyses for N, E, O, and A and they were similar for C except that cross-sectional analyses suggested an earlier onset of decline, at approximately age 50. Thus, in the same sample, with the same instrument, cross-sectional and longitudinal designs closely agreed.

Cross-cultural studies. McCrae and colleagues (1999) offered one of the first cross-cultural studies of age differences in personality. Using data from Germany, Italy, Portugal, Croatia, and South Korea, they compared four age groups (18–21, 22–29, 30–49, and 50+) on factors of the NEO-PI-R. In all five cultures, E and O declined and A and C increased cross-sectionally; N showed significant declines in German and South Korean samples. The largest changes were in the younger groups. A follow-up study (Costa et al. 2000) extended these findings to Russia, Estonia, and Japan. As in McCrae and colleagues' study, the only inconsistency was found for N, which showed no significant decline in Russia or Estonia.

An extension of these findings to younger individuals was reported by McCrae and colleagues (2018). They examined NEO Inventory factors in observer ratings of 7,449 adolescents aged 12 to 21 from 23 cultures; the inventory was administered in 17 different languages. N declined in 17 cultures, and E declined in 20 cultures. O and A increased in 21 cultures, whereas C increased in all 23. Note that these findings are consistent with the earlier cross-cultural studies except with regard to O. Combined, these studies suggest that O rises during adolescence but declines in later adulthood. This pattern had previously been noted by Roberts and colleagues (2006) in their meta-analysis of longitudinal studies.

The general uniformity of results across cultures as different as Uganda, South Korea, and Chile has two major implications. First, such varied cultures have had dramatically different histories over the past century, so successive generations growing up in them might have been expected to show widely varying cohort effects. They did not, suggesting that cohort effects on personality are limited—a conclusion that can also be reached using a comparison of cross-sectional and longitudinal studies. Second, whatever causes normative personality development is either common to most cultures or independent of cultural influences. Nevertheless, there are intriguing exceptions to this generalization, such as the failure to find declines in N in several cultures and significant differences in rates of change across cultures (Bleidorn et al. 2013, McCrae et al. 2018).

Cross-instrument comparisons. Are the developmental curves seen in NEO Inventories data replicated with other instruments? Soto and colleagues (2011) reported a cross-sectional study of the Big Five Inventory (BFI; John et al. 1991) in an Internet sample of more than 1 million respondents aged 10 to 65 from the United States and five other English-speaking nations. The BFI is a well-validated instrument that shows strong convergent correlations with the NEO-PI-R scales (Soto & John 2009), so one might expect similar age trends. In fact, from adolescence on, similar results are seen in the BFI and the NEO-PI-R for N, which declines, and for A and C, which increase, up to age 65. As with studies of the NEO-PI-R, the largest increase is for C, and it occurs chiefly in early adulthood. But BFI trends for O and E are substantially different. O increases in adolescence and early adulthood—as it does in NEO-PI-R studies—but then continues to increase gradually throughout adulthood. E, which consistently declines in NEO-PI-R studies, is essentially flat after age 15 in the BFI study.

Ashton & Lee (2016) reported a study of more than 100,000 Internet respondents who completed the HEXACO-PI-R. They reported an increase rather than a decline in E; like Soto and colleagues (2011), they found that O increased up to age 60. It is possible that these findings are driven by self-selection in the Internet sample; older respondents may be more likely to join the study if they are especially high in O. Some support for that view is seen in the research of Donnellan & Lucas (2008), who analyzed BFI scores in national probability samples in the United Kingdom and Germany. Unlike Soto and colleagues (2011), they found declines in both E and O.

However, Donnellan & Lucas (2008) used a very brief version of the BFI, raising the alternative possibility that variations in developmental curves across studies are due to the use of different instruments. Why should O decline when measured by the NEO-PI-R but increase when assessed by the BFI and HEXACO-PI-R? The most obvious answer is that the operationalizations of O differ in ways that are related to developmental processes. The five factors are extremely broad constructs, and any given measure is likely to tap only a subset of relevant content. The three instruments compared in this section all assess not only broad factors, but also more specific facets, and the facets that they include differ. The NEO Inventory facets for O are Openness to Fantasy, Aesthetics, Feelings, Actions, Ideas, and Values. Only two of these—Aesthetics and Ideas—are included in the BFI. The HEXACO-PI-R has four facets for O, named Aesthetic Appreciation, Inquisitiveness, Creativity, and Unconventionality. The developmental trend for these facets varies even within instrument: Ashton & Lee (2016) found that Inquisitiveness and Aesthetic Appreciation increase with age, whereas Unconventionality declines. The selection of facets to define a factor can influence the direction and rate of developmental change in the overall factor.

One might reasonably expect that comparisons across instruments at the facet level would yield more consistent results. For example, the HEXACO-PI-R Unconventionality facet seems to be similar to the NEO-PI-R Openness to Values facet, and both of these facets declined with age (see Terracciano et al. 2005). However, whereas in the BFI, Aesthetics and Ideas facets both increased with age, in the NEO-PI-R, Aesthetics did not change, and Ideas actually showed a small decline. Subtle differences in the item content—nuance-level traits (Mõttus et al. 2017)—may account for differences at the facet level. Clearly, as Soto and colleagues (2011, p. 342) argued, "conceptualizing traits at the level of Big Five facets is necessary for a full understanding of life span age differences in personality"—but it may not be sufficient.

Different measures of the same trait include different facets or nuances, and facets and nuances have specific variance unrelated to the trait that the scale is supposed to measure (McCrae 2015). The specific variance is often related to age (Mõttus et al. 2015), and the age associations, although very small, are robust, appearing consistently across cultures for facets (McCrae et al. 1999) and even nuances (Mõttus et al. 2018). We have no idea why these microtraits show developmental patterns, but we must take them into account when attempting to integrate the literature across instruments. Clearly, there is a need for large-scale studies that administer multiple measures of the same or similar constructs to the same individuals at the same times and in the same manner, so that instrument-specific developmental trends can be identified. These results could then be used to correct estimates of developmental trends in the shared construct.

Cross-informant comparisons. True developmental changes ought to be consensually valid—that is, different observers (including the self) ought to agree on the direction and size of changes. As we argue below, this applies to changes in the individual, but it is especially pertinent to changes in groups, where the unreliability of individual change measures is reduced by aggregating across many individuals.

Using the observer rating form of the NEO-PI-R, McCrae and colleagues (2005b) asked more than 11,000 respondents from 49 cultures to describe an individual whom they knew well who was either college age (18–21) or adult (40+). Consistent with earlier studies using self-reports, adults were rated as being lower than college-age targets in N, E, and O and higher in A and C (*d*s = –0.04, –0.41, –0.35, 0.11, and 0.62, respectively). Note, however, that the effects for N and A were much smaller than typically seen. Although N has been reported to be unrelated to age in some cultures (e.g., Russia; Costa et al. 2000), the A factor consistently shows cross-sectional increases in cross-cultural studies using self-reports. Yet significant age differences in A were found in only 12 of the 49 cultures, and for two of these (Japan and Portugal), adults scored lower, rather than higher, in A.

One limitation in interpreting the data of McCrae and colleagues (2005b) is that method differences are confounded with sample differences. Portuguese self-reports that showed an increase in A (McCrae et al. 1999) were from one sample; Portuguese targets of observer ratings were from another. A stronger design would gather multimethod assessments in the same sample.

Rohrer and colleagues (2018) compared age differences in self-reports and informant ratings in a large ($N > 10{,}000$) Internet study. Targets were aged 14 to 29; they completed a 100-item adjective measure of the five factors. Individual informants ($M = 2.45$ per target) responded to only 10 of the items, selected at random; collectively, across the full sample, informant ratings were based on the same 100 items. Both self-reports and informant ratings showed the usual cross-sectional increases in O and C found in this age range, but neither showed the increase in A that is typically reported. N declined in self-reports, but not in friends' ratings. Rohrer and colleagues (2018, p. 1) noted that even when the sources agreed on the direction of an effect, there were "discrepancies regarding timing and magnitude."

In a 17-year longitudinal study, Luan and colleagues (2017) reported that between age 12 and age 29, German adolescents increased in O, A, and C in both self-reports and parent ratings. The sources also agreed that there was no net change in E (using an adjective measure of that factor). There were, however, some differences between self- and parent reports: Parents reported a decline in N that was not seen in self-reports [note that this is the opposite of the discrepancy reported by Rohrer et al. (2018)], and the increases in O and C reported by parents were significantly larger than those seen in self-reports.

Luan and colleagues (2017) also reported results of a 2-year longitudinal study of 576 Dutch adolescents aged 12 to 17 for whom self-reports and father, mother, and sibling ratings were available. The short retest interval and the limited age range make accurate assessment of true developmental change difficult, and results were often inconsistent. Generally, father and mother agreed that the targets declined in O and A, whereas self and sibling agreed that the targets increased in these factors. The usual increase in C was found in self-reports and sibling ratings but not in the perceptions of parents.

It is unclear what accounts for differences across methods, but these studies underscore the need for more, and better designed, multimethod studies. To make sense of them, it will be necessary to propose and test hypotheses about the causes of divergence across informants. For example, in a design like that used by Luan and colleagues (2017), one might conduct interviews with parents and siblings, asking on what they based their ratings of O and A and their (discrepant) perceived changes in these traits. Qualitative analyses of the responses might suggest testable hypotheses. Until psychologists are confident that they can accurately describe normative changes in personality, they cannot hope to explain them. A great deal of work is still needed on the natural history of personality trait development.

Development in the Youngest and Oldest Individuals

We include in our review individuals aged 10 and over, but the bulk of life span personality research has focused on respondents aged 18 to 65. Some recent studies have moved beyond these limits.

The transition to adolescence. Studies of adolescents are becoming more common, but late childhood is still underresearched. Soto and colleagues (2011) provided a useful start by including respondents as young as 10 in their Internet study. Inspection of their developmental curves points to a striking finding: For all five domains, age 15 appeared to be pivotal. From ages 10 to approximately 15, children declined in E, O, A, and C, and girls also increased in N. Thereafter, there were increases in O, A, and C and declines in N; E showed little change. Some of these findings were replicated by Dennissen and colleagues (2013), as well as by Van den Akker and colleagues (2014), who examined self-reports of children aged 9 to 20 on five measurement occasions. They

Table 1 Significant mean changes in four longitudinal studies of oldest adults

Study	Initial		Retest (years)	Factor				
	N	Age		N	E	O	A	C
Berg & Johansson (2014)	408	80–98	≤6	—	↓	NA	NA	NA
Wagner et al. (2016)	463	70–103	≤13	↑	↓	↓	NA	NA
Kandler et al. (2015)	410	64–85	5	↑	↓	—	—	↓
Mõttus et al. (2012)	209	80–81	6	—	↓	↓	↓	↓

↓ indicates decline; ↑ indicates increase; — indicates no change. Abbreviations: A, agreeableness; C, conscientiousness; E, extraversion; N, neuroticism; NA, not assessed; O, openness.

too found a dip around age 15 for scales of the Hierarchical Personality Inventory for Children (Mervielde & De Fruyt 1999) measuring Imagination (similar to O), Benevolence (similar to A), and C. Because the self-reports of children are often psychometrically weak (Allik et al. 2004, Soto et al. 2008), it is particularly important to use multiple observers, and Van den Akker and colleagues also reported mothers' ratings of their children. Unfortunately, data collection from mothers stopped at age 17, and the self-report results were not clearly replicated within this time frame. For example, between ages 10 and 17, mothers' ratings of Benevolence showed an inverted U rather than a trough. More multimethod research is needed.

Extreme old age and terminal decline. Roberts and colleagues' (2006) review of longitudinal studies did not project age changes beyond age 75, but a few studies have since focused on age differences and changes in extreme old age; longitudinal studies are summarized in **Table 1**. All of these studies are broadly consistent. The declines in E and O are continuations of monotonic trends seen throughout adulthood, but the increase in N and the decline in C represent a change in direction and imply curvilinear development for these factors (see also Terracciano et al. 2005).

Wagner and colleagues (2016) conducted analyses of changes in N, E, and O as a function of time to death and found that, independent of age, N increased more rapidly in respondents nearer to death. This suggests the hypothesis that declining health increases N, but supplementary analyses found no evidence that either physician-diagnosed or self-reported health declines were associated with change in N. Replications of this study design that assess all five factors would be useful.

An increase in N and a decline in C are the most striking personality changes in Alzheimer's disease (Robins Wahlin & Byrne 2011), so it is possible that the effects seen in studies of unscreened older samples are due to the presence of a subsample with cognitive impairment. Some support for this hypothesis is provided by a study of informant ratings of centenarians (Davey et al. 2015) that compared more and less cognitively impaired groups. Both groups scored lower than adult norms on C, but the more impaired centenarians were significantly lower on this factor than the less impaired. More impaired targets were rated as slightly higher than adult norms on N, whereas better functioning centenarians were slightly lower than norms. Importantly, the effects of cognitive impairment on personality are not limited to old age. Roy et al. (2018) examined multiple sclerosis patients (with a mean age of 45) and found that, over a 5-year interval, patients showed greater declines in E and C than did healthy controls, and that—within the patient sample—personality changes were more pronounced among those classified as cognitively declining versus stable. This implies that studies of personality development in groups at risk for cognitive impairment should routinely include measures of cognitive functioning.

CAUSES OF STABILITY AND CHANGE

There is currently a new enthusiasm among personality psychologists for generating and testing theories that account for personality change and development across the life span (Specht 2017). A distinguished consortium of authors (Baumert et al. 2017) has offered an ambitious agenda for explaining behavior, personality structure, and personality development in terms of underlying personality processes. Other theorists have considered the potential roles in personality development of recurrent daily experiences (Wrzus & Roberts 2017), life span developmental tasks (Hutteman et al. 2014), and self-regulation (Hennecke et al. 2014). At the same time, methodological sophistication is increasing in both design and analysis of developmental data (e.g., Bleidorn et al. 2018, Jackson & Allemand 2014). These are welcome developments because, at present, much remains to be explained. Theories of personality development need to account for (*a*) the prevailing stability of individual differences, (*b*) the occurrence of individual changes, and (*c*) the origins of normative developmental trends. In this section, we contrast biological and psychosocial explanations of these three phenomena, but it should be clear that they are not mutually exclusive—both biology and experience may play some role.

Individual Stability

Why are individual differences in personality so enduring? One obvious possible reason is genetics, but it is also possible that personality continuity reflects the force of a stabilizing environment. This might account for the fact that traits exhibit more rank-order stability in midlife than in emerging adulthood, when transitions into and demands from new careers, families, and communities are common. The relative contributions of genetics and nongenetic factors to personality stability can be assessed in behavior genetics studies.

In a meta-analysis of monomethod longitudinal twin and sibling studies, Briley & Tucker-Drob (2014) concluded that genetic influences on phenotypic personality themselves show increasing stability up to approximately age 30; thereafter, genetic influences become perfectly stable. Genes account for a little over half of the stability of observed trait scores: Genetics contributes approximately 0.38 to the estimated 0.71 stability coefficient found for older adults over a 5-year interval.

Briley & Tucker-Drob (2014) drew from this the obvious—but potentially misleading—conclusion that 0.33, or slightly less than half, of the observed stability is due to the environment. Using the conventional language of behavior genetics research, this is an appropriate inference because environmental simply means not genetic. Although most psychologists might assume that this term must refer to one's family, neighborhood, career, and so on, the environment also, crucially, includes error of measurement. Briley and Tucker-Drob dealt carefully with the issue of random error (which, of course, would not contribute to stability), but, like most behavior geneticists, they neglected the systematic error of method variance. Method biases (e.g., an individual's systematic overestimation of their level of E) contribute as much as 40% of the variance in single-source assessments, and they are stable over periods of many years (McCrae 2018). Much of the observed stability of self-reports or informant ratings that is not accounted for by genes might be due to stable method bias.

One elegant study has addressed this issue. Kandler and colleagues (2010) administered self-report measures of the five factors to German mono- and dizygotic twins on three occasions spanning 13 years; they also obtained personality ratings from two peers at the same times. With this design they were able to control both random error and method biases and thus estimate stability and change in true scores. They found strong genetic contributions to true-score stability; there were also significant effects for the nonshared environment, but they were much weaker than those suggested by the Briley & Tucker-Drob (2014) analysis. Kandler and colleagues (2010,

p. 1003) concluded that "Environmental factors chiefly affected short-term stability and rank-order change in personality."

Unfortunately, designs like this offer virtually no insight into what the operative environmental factors are. Work experiences, traumatic events, or evolving relationships might be involved, but it is also possible that the most important influences are biological, such as diet, disease, or drug use.

Although it also does not specify the relevant environmental factors, the corresponsive principle (Roberts & Nickel 2017) suggests a mechanism by which they might operate. It holds that people choose environments (in part) on the basis of their traits, and the chosen environments reinforce the traits. This might contribute to stability, although it could also lead to change. For example, Jeronimus and colleagues (2014) reported that N led to long-term difficulties in living, which in turn increased N. Mõttus and colleagues (2016) argued that the cumulative effect of the corresponsive principle should be the intensification of individual differences: Extraverts, for example, would become more extraverted and introverts more introverted. This would be manifest in higher variances for trait measures in older respondents. However, in samples from Estonia, the Czech Republic, and Russia, they found no evidence of higher variance for respondents in their 50s than for those in their 20s.

Perhaps the corresponsive principle simply compensates for random changes to trait levels caused by life events beyond the individual's control; the net effect, then, would be to maintain rather than intensify the trait. However, these arguments presume that events and circumstances in fact alter trait levels, and that has proven more difficult to demonstrate than most psychologists might have anticipated.

Individual Change

Even corrected for unreliability, retest coefficients seldom reach 1.0; personality scores change (relative to normative development) throughout adulthood (Schwaba & Bleidorn 2017). Such changes may be attributable to either psychosocial or biological processes.

Psychosocial processes. Most psychologists probably expect that personality changes are the result of life experience: traumatic events, role transitions, psychotherapy, and so on. There are many studies reporting such effects—for example, Galdiolo & Roskam (2014) found that fathers' E decreased 1 year after the birth of a child, and Riese and colleagues (2014) showed increases in N after recent stressful life events. However, the effects tend to be small, scattered, and sometimes difficult to understand: Why would the birth of a child cause a decrease in E in fathers (but not mothers)? In a careful review of the topic, Bleidorn and colleagues (2018) noted that there were relatively consistent findings for beginning a relationship (which increased E and A) and beginning work (which increased O, A, and C and decreased N), but they found no reliable effects for ending a relationship, marriage, divorce, parenthood, widowhood, job loss, or retirement. They concluded that there is "some evidence that life events can lead to changes in personality" but that "the evidence for the nature, shape, and timing of personality trait change . . . is still preliminary" (Bleidorn et al. 2018, p. 83).

In the transactional paradigm (Neyer & Asendorpf 2001), traits influence the choice of relationships, and relationships, in turn, are thought to reshape personality. However, although there is considerable evidence for the effects of personality on relationships, "most studies . . . failed to find the expected effects of relationship experiences on personality dimensions" (Mund & Neyer 2014, p. 352). Similarly, peers have been considered an important influence on personality development (Reitz et al. 2014) as role models and as a source of group socialization. However, a large Dutch study of adolescents, their peers, and their siblings assessed across seven waves carefully examined patterns of codevelopment, including convergence, correlated change, and lagged change (Borghuis et al. 2017). The authors found no evidence of codevelopment and concluded that "adolescent friends and siblings tend to change independently from each other and . . . their shared experiences do not have uniform influences on their personality traits" (Borghuis et al. 2017, p. 641).

Several studies have tested the hypothesis that life stress increases N, with mixed results. Ogle and colleagues (2013) assessed N in 670 participants at ages 42 and 50 and compared those who had and those who had not experienced traumatic events between assessments. They found no differences; all groups showed a small, normative decline in N. However, they also reported that individuals who had experienced trauma in childhood or adolescence scored higher in N than those who first encountered trauma in adulthood—a finding replicated by Shiner and colleagues (2017). Boals and colleagues (2014) assessed N among 1,108 college students over the course of one semester. They found a small increase in N for students who reported a traumatic event between assessments, which was significant relative to the small decrease seen in the no-trauma group.

One problem with such short-term studies is that it is often difficult to distinguish trait from state effects. Measures of N typically ask about feelings of anxiety, depression, and stress, and it is clearly possible that a recent trauma could generate such feelings without any real effect on underlying trait levels. An alternative view is that traumatic events do affect traits themselves, but only for a brief time, after which the individual returns to a baseline set point. Nontraumatic but otherwise significant life events might have similar transient effects on E, O, A, and C. If such changes are common and random in the direction of their effects, this could account for the short-term (approximately 3-year) decay of retest stability reported by Anusic & Schimmack (2016).

A more elaborate mixed model has been proposed by Ormel and colleagues (2012), according to which acute life events create temporary change in N, but enduring life changes (such as chronic unemployment) can permanently change the set point. Jeronimus and colleagues (2014) reported data consistent with this view: Some changes in N associated with long-term difficulties endured as long as 13.5 years.

Virtually the entire literature on life events and trait change relies exclusively on self-reports, which is a serious limitation. Without corroboration by knowledgeable informants, we cannot rule out the possibility that only the self-concept, or self-presentational style, changes—not the trait itself. This is a very real concern because the few studies that have compared self-reported and informant-rated personality change have found little agreement (e.g., Watson & Humrichouse 2006).

Biological processes. Deviations from the normative trajectory may also be due to biological processes. Genes, for example, may account for some individual differences in trait change (Kandler et al. 2010, McGue et al. 1993). Exercise, or the lack of it, apparently alters the trajectory of personality change: Stephan and colleagues (2014) reported that baseline physical activity was associated with decreased change in E and C in two large samples of older adults, perhaps because it helped sustain the energy needed to express those traits.

A dramatic illustration of the impact of biological factors on trait change was provided by a study of individuals with and without cognitive impairment (Terracciano et al. 2017). The mean 4-year stability coefficient for unimpaired respondents ($N = 7{,}307$) was 0.70; for individuals with dementia ($N = 454$), it was 0.43. This difference was not due to the greater age of the latter group; when individuals with impairment were excluded, the mean stability of respondents over age 80 ($N = 476$, $r = 0.70$) did not differ from that of younger respondents. Nor was it attributable to a general degradation of data quality in the subsample with dementia because internal consistency was as high in that group as in others. Brain changes that are less dramatic than dementia and are found across the life span (e.g., concussions, drug abuse) could presumably account for a portion of the observed trait instability.

As with studies testing psychosocial hypotheses about trait change, those testing biological hypotheses need to include multiple informants to provide consensual validation of change. In addition, all studies of individual trait change ought to include multiple measures of the same trait. Different scales assessing the same construct often show different patterns of normative development; we cannot assume that the scales will be interchangeable in their responses to life events or biological conditions.

Normative Development

Trait changes are not all idiosyncratic; there are common developmental curves in which each individual's set point is gradually shifted. It makes sense to attempt to explain the near-universal changes in N, A, and C that are commonly referred to as personality maturation, but it is not yet clear how E and O change, so explanations would be premature.

The social investment principle. The most prominent hypothesis about a psychosocial cause of personality maturation is Roberts and colleagues' (2005) social investment (SI) principle, an aspect of the neo-socioanalytic model (Roberts & Nickel 2017). According to this principle, as individuals move from adolescence to middle adulthood, they must assume responsibilities as parents and productive workers. Low N and high A and C facilitate the successful enactment of these roles, as emerging adults become more resilient, cooperative, and responsible. Individuals who invest in their culture's age norms—the great majority of people—will cultivate these traits, and they will be rewarded by society for doing so. Over the course of several years, the effect will be the observed decline of N and increase of A and C. Because all societies have similar requirements for adult behavior, personality maturation should be seen in all cultures—as, in general, it is.

If SI were absolutely uniform across individuals and cultures, it would be virtually impossible to distinguish it from other uniform causes, such as intrinsic maturation. Tests of SI have therefore proceeded on the assumption that different life experiences affect the rate of maturation. At the individual level, emerging adults who invest in adult roles by starting a career or a family ought to show more personality change than do others of the same age who do not make the same investments. Several studies have tested this hypothesis, with mixed results. For example, Hudson & Roberts (2016) replicated earlier findings that changes in SI in work covaried with changes in A and C. However, contrary to the SI hypothesis, a large-scale prospective study of the transition to parenthood in a representative Australian sample found no effect on any of the five factors (van Scheppingen et al. 2016).

Two studies have examined SI at the culture level. In developing countries, adolescents typically end schooling and enter the work force at an earlier age. The ages of first marriage and children also vary across cultures. In cultures in which adult roles are entered early, SI seems to suggest that personality maturation would need to be accelerated; wealthy cultures that allow an extended adolescence ought to show slower rates of decline for N and increase for A and C. Bleidorn and colleagues (2013) reported that age differences in self-reported N and C (but not A) were more pronounced in cultures with earlier job transitions. However, they failed to find any effects predicted by SI due to earlier marriage and parenthood. McCrae and colleagues (2018) examined informant ratings of targets aged 12 to 21 from 23 cultures. They found no evidence that personality maturation occurred more rapidly in cultures marked by early entry into work or parenthood.

Intrinsic maturation. The biological alternative to SI is the premise of intrinsic maturation (McCrae & Costa 2008): Personality development is built into the human species, like the growth of cognitive capacity in children or the onset of menopause in middle-aged women. This hypothesis is consistent with the universality of personality maturation, and it makes sense evolutionarily: The societal benefits of becoming more resilient, cooperative, and responsible should also promote the fitness of the individual. Aging cannot be experimentally manipulated, so direct tests of the intrinsic maturation hypothesis are difficult. There are, however, supporting lines of evidence. King and colleagues (2008) conducted a longitudinal study of observed personality change in chimpanzees and found a number of parallels to human development, including increases in traits analogous to A and C. These findings are most plausibly interpreted as evidence of evolved intrinsic maturation, and this mechanism might also account for development in closely related species, such as humans.

Importantly, evolutionary influences are not necessarily limited to the reproductive life span. Through grandparenting, older adults may improve the fitness of their descendants well into later life (Hawkes & Coxworth 2013). In fact, it has been argued that normative trajectories of healthy cognitive aging (i.e., reduced fluid processing but intact long-term memory) represent an evolutionary adaptation that preserves older adults' knowledge base to be transferred to future generations (Kaplan & Gangestad 2005). By the same token, age-related personality changes favoring positive emotionality, cooperation, and consistency may have evolved to facilitate mutually rewarding relationships with younger adults in which such knowledge transfer can happen (Carstensen & Löckenhoff 2004).

PERSONALITY DEVELOPMENT BEYOND TRAITS

In addition to explorations of the causal mechanisms behind life-long personality trajectories, further theoretical advances and empirical work are needed to better integrate our understanding of trait development with nontrait aspects of personality. In particular, the literature to date has highlighted goals and strivings, along with life stories and narratives, as concentric layers of personality (McAdams & Olson 2010) that form around the inner core of dispositional traits, with motivational variables emerging in middle childhood and a coherent life story coalescing in adolescence. However, much of the research record remains compartmentalized, focusing on one layer at a time with too little attention to the developmental dynamics of interactions among layers. Five-factor theory (FFT; McCrae & Costa 2008) can serve as one framework to explore further the processes by which dispositional traits are translated into motivational concepts and narrative constructs, respectively.

As seen in **Figure 2**, FFT conceptualizes dispositional traits as basic, biologically rooted tendencies that are translated into characteristic, culturally contextualized adaptations as basic tendencies interact with external influences. Characteristic adaptations (and maladaptations) may comprise goals, strivings, and attitudes as well as the self-concept, which in turn incorporates self-schemas and the life story. Note, however, that FFT imposes certain constraints about the directionality of causal associations. The association between characteristic adaptations and external influences, for example, is assumed to be reciprocal (and mediated by objective biography), whereas the influence of basic tendencies on characteristic adaptations and self-concept is modeled as unidirectional in nature. Such constraints allow for the derivation of concrete, falsifiable hypotheses, which have the greatest potential to advance scientific progress (McCrae et al. 2018). For instance, in addition to responding to maturational forces, basic tendencies are thought to shift in response to external factors, but only if these factors affect the biological bases of personality (e.g., through exposure to chemical agents or mechanical trauma) (Ilieva 2015, Mendez et al. 2013).

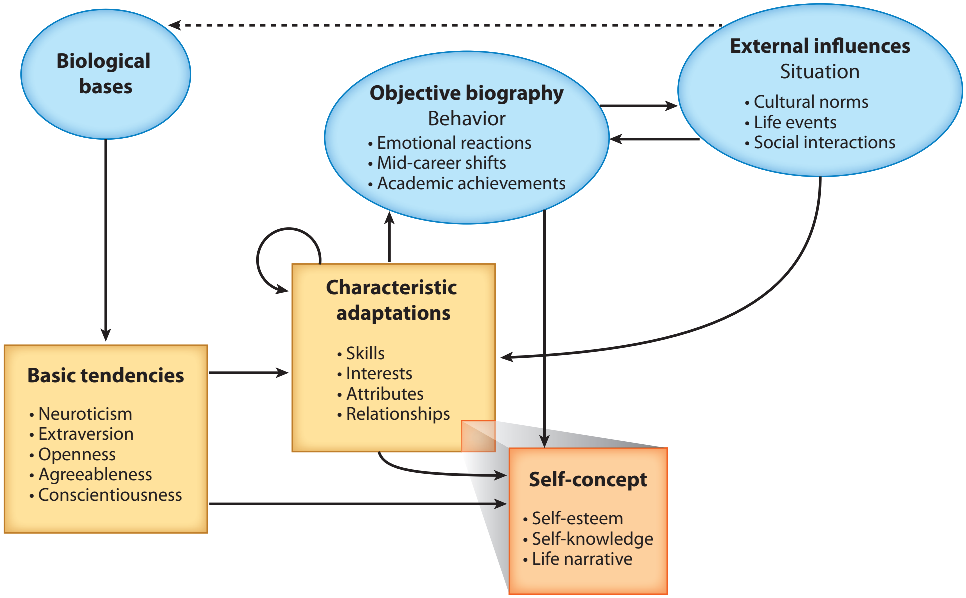

Figure 2

A representation of the five-factor theory personality system. Core components are in rectangles; interfacing components are in ovals; arrows represent causal pathways on which dynamic processes operate. The self-concept is an important subcomponent of characteristic adaptations. The dashed arrow denotes an indirect causal pathway outside the system. Figure adapted from McCrae & Costa (1996).

A successful integration across layers of personality sets the stage for linking FFM perspectives on personality structure with life span developmental frameworks that model the dynamic processes by which people adapt to age-related changes (Riffin & Löckenhoff 2017). The life span perspective (Baltes 1997), a major metatheoretical framework which continues to shape much of the current research agenda in gerontology, maps well onto FFT in that it views development as inherently multidimensional and shaped by biopsychosocial coconstruction: Maturational forces and age-related decrements at the biological level are thought to interact with psychological processes and the sociocultural environment. In spite of this conceptual overlap, the role of personality traits in shaping dynamic adjustment processes in later life remains to be systematically explored. To illustrate the potential of this approach, we consider the implications of FFM traits with regard to three dominant theoretical concepts in contemporary gerontology: selective optimization with compensation (SOC), life span shifts in control, and socioemotional selectivity.

According to the principle of SOC (Baltes 1997, Baltes & Baltes 1989), older adults manage age-related losses by selecting specific aspects of functioning that they consider to be most important, optimizing these aspects by allocating additional resources to them, and compensating for losses in other areas of life by lowering standards and recruiting additional help. It is likely that personality traits influence how these processes play out for different individuals. First, they may affect which aspects of life a person selects and optimizes. Those high in E, for instance, may prioritize opportunities for social contact, whereas those high in O may prioritize opportunities for continued exploration. Second, traits may affect access to and utilization of various resources for compensation. For instance, FFM traits were found to be associated with the use of various supportive healthcare services in older adults (Friedman et al. 2013), and, in a sample of retirees, they predicted both receipt of financial support and the sources of such support (family versus other) (Gillen & Kim 2014). Moreover, traits may influence how successfully SOC strategies are implemented over time. At the broadest level, low N and high C are known to promote the establishment of successful long-term routines and compensatory habits (McCrae & Löckenhoff 2010). More specifically, traits may interact with directed shifts in goals and priorities that are thought to promote adaptation in later life.

According to the motivational theory of life span development (MTLD; Heckhausen et al. 2010), people approach developmental challenges through a combination of primary control (changing the surrounding environment) and secondary control (changing internal experiences). Successful development requires a dynamic interplay between the two kinds of control, but their relative balance is thought to shift over the adult life span—not only because age-related cognitive and physical decrements limit the ability to exert primary control, but also because many life goals (e.g., parenthood, careers) have age-related deadlines after which it becomes more adaptive to manage one's disappointment about not having reached the goal (i.e., secondary control) rather than continuing active pursuit of the goal (i.e., primary control). FFM traits may show differential associations with each type of control. The ability to exert primary control, for example, is likely to be associated with the competence and self-discipline facets of C whereas secondary control may come more easily to those low in N and high in compliance, a facet of A (McCrae & Löckenhoff 2010). At the same time, those high in assertiveness (a facet of E) and achievement striving (a facet of C) may find it more difficult to relinquish primary control and shift to secondary control when faced with developmental deadlines. A systematic exploration of such associations might reveal why the life-long balance between primary and secondary control is more easily achieved by certain individuals.

Similarly, personality traits may affect people's ability to restructure their social networks proactively in later life. According to socioemotional selectivity theory (Carstensen et al. 1999), as time horizons become more limited in old age, people prioritize emotional well-being in the present moment and seek small, tight-knit social networks that emphasize meaningful relationships with close friends and family. People were found to actively restructure their social networks along those lines (Lang 2000), but, depending on their personality traits, some may find this more difficult than others. Across the life span, low C and A and high N are associated with relationship dissolution (for a meta-analysis, see Roberts et al. 2007), and people with those traits may lack a core network of close others to fall back on as they face the challenges of later life.

These brief examples highlight the potential of a trait perspective to enrich our understanding of interindividual differences in adaptation to later life. To date, the majority of the proposed associations must remain conjectures, but much could be gained by routinely including trait assessments in pertinent studies to systematically explore interactions between personality traits and different aspects of dynamic adjustment to later life.

CONCLUSION

The science of life span personality development made rapid strides after 1980, but the pace of progress has slowed. To provide a detailed account of the natural history of traits and to build a body of replicable findings on the causes of stability and change, the field must address basic issues in trait assessment and study design. We must recognize that alternative measures are not necessarily interchangeable, that large samples cannot fully compensate for brief scales, and that multiple assessments are most informative when the span of the study covers many years. Perhaps most crucially, we must investigate the reasons for discrepancies between self-report and informant rating data on personality development. Traits are important determinants of health, happiness, and generativity; it is worth redoubled efforts to understand how they endure and why they change.

SUMMARY POINTS

1. Individual differences show continuity from middle childhood to old age, with large retest coefficients over long intervals of time—up to 40 years—beginning in young adulthood. However, progress in providing more detailed or nuanced views of differential stability has been slow.
2. Although stability coefficients show declines with increasing retest intervals, they rarely fall below 0.6, and most of the decline occurs within the early part of the retest interval.
3. Methodological variations across studies can lead to different conclusions about the developmental course of stability coefficients. Some studies do not correct for unreliability; others overcorrect by using coefficient alpha rather than test–retest reliability.
4. The normative developmental course of trait levels is smooth, with no jags at particular ages or in relation to normative life events. Cross-cultural studies show broad agreement that Neuroticism and Extraversion decline while Agreeableness and Conscientiousness increase over the life span. Openness generally rises during adolescence and declines in later adulthood.
5. There is less agreement regarding the developmental course at lower levels of the trait hierarchy. Specific measures vary in the facets or nuances associated with each higher-order factor, and this makes it difficult to compare the direction and rate of developmental change across studies.
6. Until psychologists can accurately and fully describe normative changes in personality, they cannot explain them. Yet there is growing enthusiasm for generating and testing theories that account for the prevailing stability of individual differences, the occurrence of individual change, and the origins of normative developmental trends.
7. Psychosocial theories such as the social investment (SI) principle have generated several studies with mixed results. Intrinsic maturation, one biological alternative to SI, also has limited direct support, although evolutionary perspectives, cross-cultural data, and comparative studies are consistent with the intrinsic maturation hypothesis.
8. Five-factor theory (FFT) is offered as a framework to understand development in both trait and nontrait aspects of personality and the processes by which dispositional traits are translated into motives and life narratives. A number of other perspectives that are complementary to FFT—including the life span perspective, selective optimization with compensation, the motivational theory of life span development, and socioemotional selectivity theory—highlight the potential of a trait perspective to enrich understanding of interindividual differences in adaptation to adult and later life.

FUTURE ISSUES

1. Longitudinal and cross-sectional studies should be conducted that include multiple, full-length personality inventories to examine instrument-specific developmental trends; short-form versions scored from these data should also be analyzed.
2. Researchers should initiate longitudinal studies of personality traits in a variety of non-Western cultures (and nonhuman species).

3. Investigators should formulate and test hypotheses about why self-reports of developmental trends sometimes diverge from informant accounts.
4. Studies of the effects of interventions and life events on trait change should routinely include pre- and postevent observer rating data to corroborate self-reported change.
5. Gerontological theories of late-life adaptation would benefit from systematically incorporating trait concepts and measures.
6. Studies on trait development in advanced old age need to differentiate more clearly between aging and terminal decline by examining the effects of both chronological age and time to death.
7. Multimethod studies of the effects of cognitive impairment on both rank-order stability and mean trait levels are needed.

DISCLOSURE STATEMENT

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Errata

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