

Mechanisms by Which Childhood Personality Traits Influence Adult Well-Being

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ABSTRACT—*Children's personality traits have enduring effects that shape adult well-being. In particular, childhood conscientiousness influences core aspects of adult well-being: health, friendships, and mastery. Research is now examining the mechanisms by which early personality traits initiate and sustain particular life paths. These include mediating and moderating mechanisms that may operate during critical developmental periods or may build cumulatively over time. Future research would benefit from testing theoretically derived mechanisms for different traits and examining variables as they change over time, using both short- and long-term longitudinal designs over different life stages.*

KEYWORDS—*childhood personality; mechanisms; health behaviors; self-regulation; stress*

At its core, adult well-being consists of good physical and emotional health, satisfying interpersonal relationships, and mastery in chosen fields. Childhood personality traits have been implicated in the attainment of all three components of well-being, and some progress has been made towards identifying mechanisms by which they do so. Adult well-being is the result of a complex web of biological, social, and psychological influences unfolding over the life course, which makes it challenging to trace the causal paths connecting early childhood personality traits to adult outcomes. Consequently, while there is growing evidence for associations between childhood traits and adult outcomes, research on mechanisms to account for these associations remains relatively scarce. This paper describes the mechanisms that have been the most studied to date and illustrates them with some preliminary findings.

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Two recent reviews have documented the power of personality to predict consequential outcomes (Ozer & Benet-Martínez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Significant aspects of adult well-being predicted by childhood personality traits include mortality, marital outcomes, educational attainment, career success, the quality of peer and family relationships, and antisocial behaviors. One childhood trait that emerges as a surprisingly consistent predictor is conscientiousness and its close associates. Conscientiousness refers to a broad constellation of attributes reflecting industriousness, orderliness, and self-control. Adults who were low on conscientiousness in childhood are less likely to achieve scholastic and career success and to stay married or employed, and they are more likely to endanger themselves and others by unhealthy, risky, or even criminal behaviors.

Far-reaching influences of childhood traits do not depend on the assumption that personality traits remain stable from childhood to adulthood. In fact, there is increasing evidence for modest personality change over time: People tend to become less risk-taking, more socially dominant, and more conscientious over the lifespan, and there are individual differences in the rate of trait change (Roberts, Wood, & Caspi, in press). Early trait effects may later become self-sustaining and endure long after the original trait influence has changed. Moreover, the significance for well-being of those traits that do remain relatively stable over the lifespan may change over the life course, as may their mechanisms of effect.

In what follows, I describe three mechanisms by which childhood traits exert their influence on adult well-being: health-behavior, self-regulation, and stress mechanisms. Each of these mechanisms also involves one or more of the following lifespan developmental processes: *mediation*, *moderation*, *critical periods*, and *accumulation*. I briefly describe illustrative research demonstrating these mechanisms and processes for childhood conscientiousness, sensation seeking, and hostility. I conclude with recommendations for future research.

HEALTH-BEHAVIOR MECHANISMS

Well-being and good health go hand in hand. Much of the research on the mechanisms through which childhood personality traits influence later well-being has focused on health outcomes and a large proportion of this research has evaluated health-behavior mechanisms. In an influential study of the influences of childhood traits on adult health outcomes, Friedman et al. (1995) found that children in the Terman Life-Cycle Study who were highly conscientious at age 11 were about 30% less likely to die in any given year of adulthood than were those who were markedly low on conscientiousness. This eye-popping discovery triggered the search for mechanisms to explain why childhood conscientiousness is related to mortality. Building on the idea that childhood traits may influence adult health through patterns of health-enhancing and health-damaging behaviors over the lifespan, mechanisms in which health behaviors served as *mediators* of the influence of childhood traits were proposed (Friedman, 2000).

Mediating mechanisms are the most widely studied processes by which early traits influence long-term outcomes. A mediator forms a bridge in the pathway from childhood trait to adult well-being. For example, if low levels of childhood conscientiousness predict a propensity to take risks, and risk-taking increases the chances of accidental death, then risk-taking is a potential mediator of the effect of childhood conscientiousness on longevity. If statistical tests show that the direct association between childhood conscientiousness and longevity is reduced or disappears when the intervening variable is included in the analysis, then mediation has been demonstrated (see Fig. 1a).

Consistent with one step in the mediation model (see path A in Fig. 1a), there is abundant evidence that less conscientious individuals are more likely to engage in unhealthy activities—such as tobacco and other substance use, risky sex, risky driving, and violence—that increase the risk of life-threatening disease and accidents (Bogg & Roberts, 2004). These findings strongly suggest that health behaviors may mediate the effects of childhood conscientiousness on health outcomes, but the ideal demonstration requires examining all the paths shown in Figure 1a in the same study. To illustrate, in a 40-year follow-up study, the effect of childhood conscientiousness assessed in elementary school on self-rated health at middle age was partially mediated by smoking: Less conscientious children smoked more as adults, and higher levels of smoking predicted poorer adult self-rated health (Hampson, Goldberg, Vogt, & Dubanoski, 2006). The Terman study, in which the health outcome was mortality, provides an even more powerful illustration. Friedman et al. (1995) found that the association between childhood conscientiousness and longevity was partially mediated by lifetime patterns of cigarette use and other health behaviors (the indirect paths A and B in Fig. 1a).

Conscientiousness is likely to influence health behaviors through several of the more general processes by which personality traits have consequential effects. Conscientious individuals are probably more susceptible to external social controls

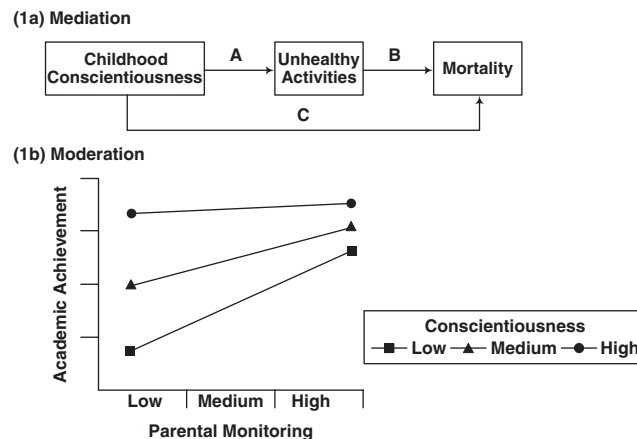


Fig. 1. The concepts of mediation and moderation. The three paths relevant to mediation are shown at top (1a): All three paths (A, B, & C) must be significant before testing for mediation. The indirect (mediated) path is composed of path A (the association between a trait and an intervening variable, e.g., child conscientiousness and an unhealthy activity like smoking) and path B (the association between the intervening variable and the outcome, e.g., smoking and mortality). The strength of the direct path C (the association between the trait and the outcome, e.g., conscientiousness and mortality) should be reduced when the indirect path is included in the model; for example, the increase in mortality found for those with lower levels of childhood conscientiousness is mediated in part by their higher levels of lifetime smoking. The strength of the association between a predictor (e.g., parental monitoring) and an outcome (e.g., academic achievement) may also depend on a moderating factor, such as the level of the child's conscientiousness (1b). In this example, children who are highly conscientious are the best protected from the effects of parental monitoring on academic achievement.

over their behavior and have greater internal impulse control, thus enabling them to delay gratification and carry out plans. They are likely to gravitate to niches that are compatible with their attributes, including relatively safe environments for work and leisure, and to seek out like-minded companions. Conscientious individuals are likely to evoke positive reactions in other people, which will serve over time to sustain these traits and related behaviors.

Not all of the association between childhood conscientiousness and longevity in the Terman study was explained by health-behavior mechanisms, indicating that other mechanisms should be investigated. Childhood conscientiousness is one determinant of educational attainment (Nofle & Robins, 2007), and Hampson, Goldberg, Vogt, and Dubanoski (2007) found that prior educational attainment had direct effects on health status at midlife, as well as indirect (mediated) effects via behaviors such as diet, exercise, and smoking. Such findings indicate that, for any given association between a childhood trait and an adult outcome, there may be more than one explanatory pathway, and pathways can involve multiple mediators.

SELF-REGULATORY MECHANISMS

Acquiring the capacity to exert self-control over one's behavior is a key developmental task of childhood and adolescence, one

that confers numerous advantages over the life course and will enhance adult well-being (Block & Block, 2006). In addition to affecting school performance, self-regulation mechanisms affect numerous other adolescent behaviors that may have long-term consequences for adult well-being, such as substance use and interpersonal relationships. Research integrating concepts from personality and social psychology has identified quite specific mediating mechanisms by which childhood traits affect adolescent substance use. These include adolescents' cognitions (beliefs) that increase their susceptibility to trying cigarettes, alcohol, and other substances (Gerrard, Gibbons, Stock, Houlihan, & Dykstra, 2006). To illustrate, children who were rated by their teachers as more hostile believed increasingly over the next 4 years that their friends and peers were drinking alcohol, and these beliefs predicted subsequent intentions to drink (Hampson, Andrews, Barckley, & Severson, 2006).

Adolescence is a *critical period* in human development. A critical period is a point in development when exposure to a risk factor has more pronounced effects than does exposure at other points in the lifespan. Adolescence is a time of experimentation, and choices made at this age can have enduring consequences. For example, the promise of illicit thrill and adventure may prompt highly sensation-seeking adolescents to join deviant peer groups whose members engage in high-risk activities such as substance use. One reason why substance use can be particularly risky at this age is because the adolescent brain is not sufficiently developed to exert a restraining influence (Spear, 2000). Although levels of sensation seeking tend to go down with age, early experimentation during this critical period may have lasting impacts on neurological structures, as well as on other psychological addiction processes, which could maintain substance use after the brain has reached maturity and sensation seeking has declined. More generally, habits formed in adolescence may set an individual on a life-course that is hard to modify.

Children who make friends and are accepted by their peers are at lower risk for subsequent threats to well-being such as depression and poor academic performance. Self-regulation is important for successful peer relationships because it enables restraint of aggressive and selfish impulses and promotion of socially appropriate behavior. Personality traits such as conscientiousness affect self-regulation. Jensen-Campbell and Malcolm (2007) found that more conscientious children had better peer relations and that this association was mediated by these children having fewer externalizing and attentional problems. Mediation is theoretically distinct from *moderation*, which, although much less studied, is another possible mechanism by which childhood personality can influence subsequent well-being. Moderating mechanisms exert protective or exacerbating effects on an association between an etiological variable and an outcome, and are typically evaluated by examining statistical interactions (see Fig. 1b). For example, Jensen-Campbell and Malcolm (2007) examined whether the negative

effects of anxiety and fearfulness on peer relations were moderated by conscientiousness. They found that anxiety and fearfulness had less effect on the friendships of adolescents with higher levels of conscientiousness than it did on the friendships of less-conscious adolescents. That is, conscientiousness served to buffer (moderate) the harmful effects of anxiety. This was a cross-sectional study of adolescents, but the self-regulatory mechanisms identified here could exert enduring influences on well-being.

To sum up so far, health-behavior and self-regulatory mechanisms have been studied by examining variables that extend over long periods (e.g., educational attainment, lifetime extent of smoking), or are more narrowly focused (e.g., adolescents' beliefs about their peers and interpersonal relationships). These studies provide evidence for intervening behaviors through which prior personality traits affect subsequent well-being. In contrast, stress mechanisms involve physiological processes as well as behavioral ones.

STRESS MECHANISMS

It is becoming increasingly clear that persistent stress has cumulative, negative consequences for adult well-being through physiological processes. Prolonged stress is implicated in the development of inflammation, which underlies major threats to health and well-being such as obesity, cardiovascular disease, depression, and diabetes (Schneiderman, Ironson, & Siegel, 2005). Transactional behavioral processes may be involved in stress mechanisms that explain far-reaching effects of childhood traits. That is, a child's personality traits affect the ways others react to him or her: A hostile child will evoke hostility from others, and an intelligent child is more rewarding to teach. Experiencing reactions from others further shapes the child's traits. More generally, lifespan development involves many transactional processes between individual-level variables, such as traits, and variables at broader levels, such as the family, the school, the neighborhood, and the wider culture (Lerner, 1991).

One such transactional process is *accumulation*, which refers to the progressive build-up over time of the effects from exposure to influences such as personality traits or environmental factors. Trait stability itself may be partially explained by cumulative processes: Childhood traits direct the individual into particular environments and provoke certain reactions in others, and those environments and responses support the continuity of those traits (Roberts, Wood, & Caspi, in press). Accumulated exposure to stress may result in health-threatening changes in physiology. For example, hypothetically, a hostile child may become caught in a vicious cycle of reciprocated hostility that, unchecked, would result in the experience of chronic stress over childhood and adolescence and, perhaps, into adulthood.

Cumulative physiological stress is believed to have damaging health consequences. The term *allostatic load* has been coined for the accumulation of wear and tear caused by physiological

responses outside optimal ranges, and is associated with increased mortality risk (McEwen, 1998). In a 3-year prospective study of children and adolescents, Räikkönen, Matthews, and Salomon (2003) demonstrated that hostility at baseline predicted worsening status on risk factors for metabolic syndrome (a precursor of diabetes and heart disease that is assessed by many of the same risk factors as allostatic load). Although this study demonstrated a prospective association between hostility and poor health, the intervening steps (i.e., that reciprocated hostility over time leads to cumulative stress, which has physiological consequences such as increased inflammation) remain hypothetical. More generally, it has been proposed that inflammatory processes are both caused by and cause depression in a reciprocal manner, and the same model may extend to anger and anxiety (Miller & Blackwell, 2006). Similar reciprocal mechanisms between physiological processes and other personality traits await discovery.

FUTURE DIRECTIONS

Although it has been established that children's personality traits predict various aspects of adult well-being, the complex causal pathways by which they do so are only just beginning to be examined. The study of these mechanisms as they unfold over the lifespan offers many new challenges, and holds the promise of exciting and innovative research characterized by integration across different fields within psychology as well as across disciplines.

Future research will benefit from both theoretical and statistical developments. With regard to theory, the mechanisms so far identified may reflect the dual processes prevalent in several other areas of psychology (Gerrard et al., 2006). Some mechanisms may be primarily rational, deliberate, and reflective whereas others may be primarily emotional and automatic. Future research from such a dual-process perspective may be best served by assessing childhood personality traits associated with higher-order concepts such as impulse and constraint instead of the more traditional five-factor model (in which personality is described by five broad dimensions: extraversion, agreeableness, conscientiousness, emotional stability, and intellect/openness). However, the various effects of any given childhood trait or theoretically related group of traits are unlikely to be limited to one kind of mechanism. For example, conscientiousness probably influences well-being through several mechanisms, ranging from deliberate behavioral choices to automatic processes that may be attributable to levels of neurotransmitters such as serotonin.

Methodologically, future research on mechanisms should take advantage of developments in statistical techniques that permit the analysis of change over time (Duncan, Duncan, & Strycker, 2006). Mechanisms for effects of personality have typically been assessed like snapshots taken at one point in time, whereas in fact they are moving targets (more like videos than still photographs). Fortunately, when longitudinal data consist of multiple

assessments over time, techniques such as latent growth modeling make it possible to examine the development (i.e., "growth") of variables such as personality traits or components of adult well-being. Moreover, growth trajectories can serve as mediators of trait influences, or trait influences can moderate the association between risk factors and outcomes modeled as growth trajectories.

CONCLUSIONS

Now that the long-term significance of personality traits has been convincingly demonstrated, it is time for research to focus on underlying mechanisms to explain why childhood traits have long-lasting effects on adult well-being. In particular, a deeper understanding of the traits of conscientiousness, impulsiveness, and restraint, and the numerous mechanisms by which they may operate, is needed. By integrating findings across studies of various life stages, it should eventually be possible to piece together entire pathways and their underlying mechanisms from childhood traits to adult outcomes.

Recommended Reading

- Carver, C.S. (2005). Impulse and constraint: Perspectives from personality psychology, convergence with theory in other areas, and potential for integration. *Personality and Social Psychology Review*, 9, 312–333. A comprehensive review of different approaches to impulsivity and constraint, and dual processing theories.
- Hampson, S.E., & Friedman, H.S. (in press). Personality and health: A lifespan perspective. In O.P. John, R.W. Robins, & L.A. Pervin (Eds.), *The handbook of personality: Theory and research* (3rd ed.). New York: Guilford Press. A selective review of studies relating personality traits assessed at different stages in the lifespan to subsequent health outcomes with a focus on mechanisms of effect.
- MacKinnon, D.P., Fairchild, A.J., & Fritz, M.S. (2007). Mediation analysis. *Annual Review of Psychology*, 58, 593–614. A technical overview of the latest developments in statistical testing for mediation.
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