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Evaluating Five Factor Theory and social investment perspectives on personality trait development[☆]

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Abstract

In this paper, we evaluate the Five Factor Theory (FFT; McCrae & Costa, 1999) and Social Investment (Helson, Kwan, John, & Jones, 2002; Roberts & Wood, in press) explanations of normative personality trait development in adulthood. FFT theory proposes that personality trait development is largely a genetic phenomenon, whereas the Social Investment theory proposes that it is largely the result of experiences in universal social roles in young adulthood. A review of cross-cultural, longitudinal, and behavior genetics studies reveals little support for the FFT position and provisional support for the Social Investment theory.

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1. Introduction

There is now a growing body of evidence showing that personality traits continue to develop after childhood, with remarkable levels of change occurring in young adulthood (Helson & Kwan, 2000; Roberts, Robins, Caspi, & Trzesniewski, 2003).

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Normative developmental changes, such as the tendency for people to become more agreeable, conscientious, and emotionally stable have been observed in multiple birth cohorts and nations, using both longitudinal and cross-sectional research designs (Helson, Kwan, John, & Jones, 2002; McCrae et al., 2000; McGue, Bacon, & Lykken, 1993; Roberts, Caspi, & Moffitt, 2001; Roberts, Helson, & Klohnen, 2002; Robins, Fraley, Roberts, & Trzesniewski, 2001; Srivastava, John, Gosling, & Potter, 2003). More complex patterns of change are found within the traits of extraversion and openness to experience. Decreases in social vitality (sociability) and increases in social dominance characterize the changes evidenced within extraversion, while openness to experience (or Intellect in Goldberg's, 1993 system) demonstrates a curvilinear relationship with age (Roberts & Walton, 2004).

The clear question that emerges from this consistent pattern of mean-level changes across the life course is *why* people demonstrate such pervasive normative developmental changes. According to Five Factor Theory (FFT; McCrae & Costa, 1999; McCrae et al., 2000), mean-level changes arise because of genetic predispositions to change in particular ways. More pointedly, traits are considered “endogenous dispositions that follow intrinsic paths of development essentially independent of environmental influences” (McCrae et al., 2000, p. 173). For example, in the case of culture, traits are conceived as causing culture rather than culture causing traits (McCrae, 2004). This position paints a very elegant picture of personality development as life experiences, random life events, and simple lessons learned from living life have no effect on our “basic” traits. Nor do shared experiences, such as the social climate of one's generation, affect change in personality traits. Change, if it does occur, arises because human beings have a species-wide genetic predisposition to develop in certain directions. We are, within this perspective, hard wired to become more socially dominant, agreeable, conscientious, emotionally stable, and less open to experience with age.

But what if life experiences and life lessons do play a role in personality development (e.g., the plasticity principle, Roberts, 1997)? Given the widespread nature of the changes shown in personality traits, the challenge for this position is to explain why people across many different cultures appear to change in the same way. One possibility lies in the universal tasks of social living, such as finding a marital partner, starting a family, and establishing one's career. As most cultures support if not *promote* these activities, they may be the catalysts for the widespread shared pattern of personality trait development found in adulthood (Helson et al., 2002).

In this paper, we will consider the evidence for both positions. First, we will evaluate the evidence for personality development being the result solely of genetics. We will then review experiential reasons for development and discuss the theoretical relevance of each position.

2. Is personality development solely a genetic phenomenon?

If the FFT perspective on personality development is correct, then we would expect several patterns to emerge in the studies tracking development across the life

course. First, as McCrae et al. (2000) have pointed out, we would expect similar patterns of development to occur across different cultures and within cultures across time. Second, we would expect there to be little or no significant deviations on the individual level from the general trends of personality development. Specifically, if the trend is for people to become more agreeable with age, then we should not find a disproportionate number of individuals decreasing in agreeableness. Third, in longitudinal studies of twins, we should find a strong genetic component to change in personality traits over time. Fourth, we should not find gene-by-environment interactions in the development of personality, as this would be pro forma evidence that something other than genes play a role in how personality develops. Finally, we should expect little or no correlation between change in personality and life experiences that ostensibly may shape development. Moreover, we should find little or no effect on personality for interventions, such as going to a therapist for help with psychological difficulties. We will briefly consider each of these ideas in turn.

2.1. Cross-cultural comparisons

First, let us consider the cross-cultural comparisons of personality development. The evidence appears to be quite strong that personality differences across age are quite similar in different cultures. McCrae and colleagues (1999) showed consistent age differences on the Big Five in six different cultures (McCrae et al., 1999). Like the longitudinal data drawn predominantly from the US, people across different countries become less extraverted (social vitality facet) and open to experience, more agreeable, conscientious, and emotionally stable. Interestingly, Helson and Kwan (2000) identified similar patterns of cross-cultural similarities in personality development. In their review of data drawn from the US, the United Kingdom, and China, people became more norm-adhering and socially dominant as they aged. The latter finding replicates across numerous longitudinal studies (Roberts, Caspi, & Moffitt, 2003). To the extent that New Zealand can be considered a different culture, we have found striking similarities in personality development in young adult samples of New Zealanders and California college students (Roberts et al., 2001; Robins et al., 2001). As McCrae (2004) notes, culture is purportedly one of the most significant environments and if it has such pervasive effects on psychological functioning as has been claimed (Markus, 2004) then its lack of effect on personality development is strong evidence that personality development is a human universal that is unaffected by environmental experiences.

We should examine this claim more closely. First, it should be noted that with the exception of studies from New Zealand (Roberts et al., 2001) and Northern Europe (e.g., Pedersen, 1991), there are no cross-cultural longitudinal studies of personality trait development. Almost all data used to support the cross-cultural generality of personality development is drawn from cross-sectional aging studies, which are susceptible to cohort differences that could provide an alternative explanation for the findings. That is to say, shared generational experiences across the globe may explain the commonalities in personality change rather than genetics. More problematic is the fact that the cross-cultural consistencies in personality development are not a

definitive test of the two opposing positions espoused above. Specifically, the findings across cultures also support the argument that universal tasks of social living drive personality development, as there are no cultures we are aware of that avoid marriage, work, and the development of a family. Finally, several studies have shown that changes in culture within specific countries over time are related to different patterns of personality development (Elder, 1979; Roberts & Helson, 1997). So, as a first line of evidence, the cross-cultural consistencies of personality development do not provide definitive support for either position and the changes in personality in response to changes in culture run counter to the FFT position.

2.2. *Developmental consistency*

The second piece of evidence that we should find if personality development is a genetically driven human imperative is a striking consistency across individuals in the patterns of personality development with age. If people tend to increase in conscientiousness, then any deviations from this trend should be minor and preferably attributable to error. Therapists face a parallel dilemma in attributing change to an intervention or to error in measurement when attempting to understand improvement in their clients, and thus developed the reliable change index (Jacobson, Roberts, Berns, & McGlinchey, 1999). It is a simple, yet grossly conservative index, in which the difference over time is divided by the standard error of the difference score. The latter is determined by both the standard deviation of the overall scale score and the reliability of the test score. The resulting change score reveals how many people change more than would be expected given the unreliability of the measure. This index can be readily applied to the domain of change in personality over time.

It should be noted that we should not expect a complete lack of individual differences in change even with the strong position of the FFT. Personality measures are not perfectly reliable. Therefore we should expect some contradictory movements just because of the unreliability of our measures. What is interesting is that across several studies, we find a level of change that is greater than is expected by chance alone (Roberts et al., 2001; Robins et al., 2001) as have several other researchers (Branje, van Lieshout, & van Aken, 2004; Vaidya, Gray, Haig, & Watson, 2002). More importantly, we find a disproportionate number of individuals changing reliably in the opposite direction than the general trends found in the data. So, for example, a significant group of college students becomes less agreeable, less conscientious, and less emotionally stable, despite the general trend in the population to increase on these traits (Robins et al., 2001). It should be noted that using other types of techniques, such as Hierarchical Linear Modeling, several studies have demonstrated significant individual differences in personality trait change even in old age (Mroczek & Spiro, 2003; Small, Hertzog, Hultsch, & Dixon, 2003). It is not easy to reconcile these patterns with the FFT position. Such individual differences in change over time would force us to make one of two conclusions. First, it may be that there is a universal code for development that is subsequently moderated by experience. This would be clearly inconsistent with the FFT position. Second, each individual may have his

or her own genetic code for development and that there is no human universal genetic code for development.

At this point then, we could maintain the FFT position, if we modified the hypothesis to be consistent with the existence of individual differences in personality trait change. It would have to read something like: “traits are considered endogenous dispositions that follow intrinsic paths, *particular to each individual*, of development essentially independent of environmental influences.” This, of course, becomes a testable hypothesis, as longitudinal studies of twins can test this directly by seeing whether personality change over time has a large genetic component. Although there is very little data to date, the data that does exist does not support the argument that personality change, especially in adulthood, is governed by genetics. Rather, childhood personality change appears to be largely genetic, while in adulthood genetics has only a “slight” influence over personality change (Plomin & Nesselroade, 1990). For example, the largest estimate of the heritability of personality trait change in adulthood was around 30% in one longitudinal study, with the average being much lower (McGue et al., 1993). This indicates that environmental factors play a larger role in personality trait change in adulthood than do genetic factors. Thus, at least in the few studies that have tracked the heritability of personality change in adulthood, there is little evidence to support the idea that development of personality over time is independent of environmental influences.

2.3. Genetic evidence

Possibly the most profound evidence for the importance of environments in the manifestation of personality comes, ironically, from behavior genetics studies themselves. First, the average estimate of the heritability of personality traits across many studies is at most 50% (Plomin & Caspi, 1999). It is unlikely that the remaining 50% of the variance in personality traits is attributable solely to measurement error. It is also becoming increasingly clear that heritability is not a pure indicator of genetic influence, yet is often mistakenly inferred to reflect solely genetic influence over a phenotype. Rather, heritability estimates reflect the role of genetics on the phenotypic expression of a trait in the given context that the estimates were drawn from. For example, heritability estimates of some personality and intelligence factors have been found to increase with age (McCartney, Harris, & Bernieri, 1990). If heritability reflects a fixed estimate of genetic influence, then why would heritability change with age? Moreover, a recent study has shown that even the heritability estimates of cognitive ability, which is purportedly more stable than personality traits, varies quite significantly depending on the socioeconomic strata from which the sample is taken (Turkheimer, Haley, Waldron, D’Onofrio, & Gottesman, 2003). Specifically, twins drawn from low SES groups had near zero heritability estimates for cognitive ability, whereas twins drawn from high SES groups had heritabilities around 80%. So in general the heritability of personality points to the importance of the environment, given the fact that half of the variance in personality is not accounted for by genetics, and using heritability estimates in a literal fashion is misleading as they reflect both genetic and environmental factors.

2.4. Gene by environment interactions

More recently, concrete evidence for the role of the environment in development has come in the form of two compelling gene by environment interaction studies. The first study demonstrated a gene by environment interaction on adolescent and adult delinquent behavior (Caspi et al., 2002). Specifically, Caspi and colleagues (2002) showed that a gene that affects synthesis of MAO neurotransmitters is a protective factor for children exposed to abuse. The expression of the gene itself had no direct effect on delinquent behavior; rather, the gene's expression in delinquency was dependent on the whether a child experienced abuse. Typically, children who are abused grow up to commit greater levels of delinquent acts than their peers. The presence of the MAO gene buffered the effect of abuse, such that boys with the gene looked surprisingly like boys who experienced no abuse on a battery of psychological and behavioral indicators of delinquency. Conversely, boys without the gene who were abused showed the highest levels of delinquent behavior in adolescence and adulthood. In the second study, stressful life events were found to moderate the expression of a gene that affects depression. Specifically, stressful life events were much more likely to result in the diagnosis of depression if a person possessed a shorter version of the 5-HTTLPR gene (Caspi et al., 2003). Far from suggesting that genes represent a sort of invariant phenomena that causes personality in a deterministic way unfolding over the lifespan, both of these studies point to the fact that certain environments are necessary for specific genes to be triggered.

While the particular genes that an individual possesses will not change over the course of a person's lifespan, it is becoming increasingly clear that the *expression of genes* is influenced by an organism's experiences and environments (Gottlieb, 2003; Johnston & Edwards, 2002; Li, 2003). For instance, biologists using gene microarray technology have been able to identify changes in the expression of specific genes as a result of experiences such as exercise in animals (Cotman & Engesser-Cesar, 2002). The clinical world has long been a proponent of a diathesis-stress model for the development of psychological disorders (Monroe & Simons, 1991; Rende & Plomin, 1992); it seems logical that a parallel system exist for trait development across the life-span.

2.5. Longitudinal evidence

Most behavior genetics studies are not longitudinal, so they cannot track changes in personality and their relation to life experience. In contrast, a number of longitudinal studies have tested whether environmental influences play a role in personality development. For example, compared to men who achieved the same or less than their fathers, upwardly mobile men became more dependable and responsible, independent, and motivated for success (Elder, 1969). They also became less self-defeating, less susceptible to withdrawal when frustrated, and less likely to lack personal meaning in their life. Men who experienced more occupational autonomy increased on feelings of competence in the years following graduation from college (Mortimer & Lorence, 1979). The relationship of work to personality change is not particular to

men. Women who had higher labor force participation showed increases in self-confidence (Clausen & Gilens, 1990) and social dominance (Roberts, 1997), while greater occupational attainment was associated with increases in norm-adherence in the transition from young adulthood to midlife (Roberts, 1997). Furthermore, work satisfaction was associated with decreases in measures of neuroticism in women (Roberts & Chapman, 2000). Many of these effects were replicated in a longitudinal study of men and women, in which, for example, it was found that occupational success was related to increases in dominance while, at the same time, job satisfaction was associated with decreases in negative emotionality (Roberts et al., 2003).

Marital and family experiences also are associated with changes in personality traits. Helson and Picano (1990) tracked personality change from age 20 to age 43 in women who occupied either traditional, neo-, or non-traditional role configurations. For example, women who occupied a traditional role configuration (e.g., homemaker) in young adulthood demonstrated fewer positive developmental gains in personality traits when compared to women who occupied neo-traditional (e.g., some involvement in the paid labor force) or non-traditional (e.g., working full time for whole career) role configurations (Helson & Picano, 1990). Moreover, changes in motherhood status and the experience of divorce were associated with changes in femininity and dominance, respectively (Roberts et al., 2002). Finally, experiencing tense, dissatisfying, and abusive relationships is associated with increases in neuroticism and negative emotionality (Roberts & Chapman, 2000; Robins, Caspi, & Moffitt, 2002).

Clearly, there is now sufficient evidence from a variety of longitudinal studies to show that life experiences in the domains of love and work are associated with personality trait change. One potential problem with these data is that they are correlational, therefore it is unclear whether the experience is causing the change in personality, or conversely, whether the change in personality is causing the life experience. There are two additional pieces of evidence that tip the inference in the direction of the environment causing change. First, in one study, experiences in young adulthood were found to predict personality change in midlife (Roberts & Bogg, 2004), such that the experience was entirely antecedent to the change in personality. So, it would be impossible in this case to infer that personality change retroactively caused the life experience. Second, there are several studies showing that clinical interventions actually change personality traits (Lambert & Supplee, 1997; Piedmont, 2001). For instance, interventions that have randomly assigned parents to groups teaching more effective parenting techniques have subsequently caused better adjustment in their children relative to control groups (Forgatch & DeGarmo, 1999; van den Boom, 1995) with moderate-sized effects observable years following the intervention (Cowan & Cowan, 2002). These more controlled interventions demonstrate that if we investigated more active efforts to change people we might find definitive proof that personality traits are malleable, even in adulthood.

In sum, the position that traits are endogenous dispositions that are independent of environmental influences fails to meet even the most rudimentary tests of validity. For a variety of reasons, researchers would like to think of traits as unchanging and not as developmental constructs. On one side, it would simplify our research world if

there was a set of variables that was unchanging and the ultimate cause of other constructs, as traits have been portrayed in the Five-Factor Theory. We would not have to address the thorny questions of why they might continue to develop in adulthood, and if they change, should we be using them only as predictors. On the other hand, the perspective that traits are unchanging, monolithic entities invites the opportunity to use traits as cannon fodder for efforts to raise the importance of other constructs that are putatively more dynamic and changeable (e.g., Cervone, Shadel, & Jencius, 2001; McAdams, 1994; Pervin, 1993). However, the preponderance of evidence does not support the perspective that traits do not develop in response to the environment, thus the portraits of traits as unchanging, and therefore lacking dynamism, is simply unfounded.

The lack of evidential support for the FFT position on personality trait development invites the question of why personality traits change, especially in adulthood. We have already alluded to several answers above, but in the latter portion of this paper we will focus on the factors that might be contributing to the more dramatic changes in personality traits in young adulthood, especially the increases in social dominance, agreeableness, conscientiousness, and emotional stability.

3. Social investment principle

Before, we discuss the Social Investment position on why personality traits change in adulthood, we would like to clarify some of our assumptions about personality trait development in adulthood. Lest, we give the impression that personality change is ubiquitous, we are not arguing for a radical contextualist position on personality change in which all of the functioning variance of personality is determined by the environment (i.e., Lewis, 2001). Rather, as we have noted elsewhere, personality traits demonstrate moderate levels of continuity, smaller, but still significant normative changes, and individual differences in change, often later in the life course than initially expected (Roberts & Caspi, 2001). From a meta-theoretical perspective, we need genetic, transactional, and stochastic factors to successfully account for this overall pattern of personality development (Fraley & Roberts, *in press*). The Social Investment perspective is solely dedicated to explaining some of the transactional and stochastic factors that might contribute to personality development and does not preclude the existence or effect of genes on development, or the existence of moderate levels of continuity over time.

As we alluded to above, one alternative position for why normative changes in personality traits occur predominantly in young adulthood are the universal tasks of social living, such as establishing one's own career and family (Helson et al., 2002). More specifically, we have expanded on these ideas under the guise of the *social investment principle* (Roberts & Wood, *in press*). The social investment principle states that investing in social institutions, such as age-graded social roles, is one of the driving mechanisms of personality development. Three assumptions underlie this principle. First, that people build identities by making psychological commitments to social institutions in the form of social roles, such as work, marriage, family, and

community. These roles can be seen as parallel to the expectations of a social clock (e.g., Helson, Mitchell, & Moane, 1984) such social such roles are, in and of themselves, viewed as societal expectations at a given age. Second, and more central to our view of how such roles enact change, these social roles come with the own set of expectations and contingencies that promote a reward structure that calls for becoming more socially dominant, agreeable, conscientious, and less neurotic. Third, that the dominant pattern of role investments seen in quasi-universal tasks of social living, such as developing a career and career identity (Helson et al., 2002), helps explain the normative patterns of personality change that result from role investments.

The crux of the process of personality development, within the social investment framework, lies in committing oneself to social institutions outside of one's existing identity structure. This act exposes a person to the contingencies contained in the new social role, expressed in the form of role expectations for appropriate behavior (Sarbin, 1967), set forth by the self and the collective other. For example, people will come to their first job with a set of expectations for how they should act that are derived from their experiences watching significant others in the same types of roles, such as parents, mentors, friends, and other influential people (Caspi & Roberts, 1999). In addition, individuals in a person's social circle will hold a set of expectations for how the person should act and will reward or punish the person depending on whether he or she acts consistently with those expectations.

Such role expectations can effect change through either punishing inappropriate behavior or rewarding appropriate behavior. Role expectations exert social control over behavior, such that if a person violates the expectations they will be punished. For example, delinquent boys relinquish their life of crime upon getting married, in part because when they got married their wives kept them in line through threats and admonishments (Sampson & Laub, 1990). Similarly, making commitments to conventional institutions, such as religion, exerts a form of social control, as one's behavior is directly supervised and monitored by friends and family members who also participate in the typically conventional organization (Hirschi & Stark, 1969). Implicit in this idea is the fact that people will reward others for acting in accord with expectations through increased social regard and acceptance.

The implication of the social investment principle is that investments in conventional social institutions should be related to elevated scores on measures of social dominance, agreeableness, conscientiousness, and emotional stability and to increases in these dimensions over time. An important distinction is whether investment is captured in acquiring the role or in the psychological qualities of investing in the role. It is the latter psychological investments that are more critical, as people can occupy social roles, such as a job or a marriage, yet not be invested in these roles. So, rather than examining *whether* people are working, what is critical is *how* they are working and the expectations they have for themselves and the expectations that others have for them in these roles.

Like the FFT perspective on normative change, we should examine the evidence in support of the social investment hypothesis. What would we expect if it were true? First, we would not expect that every person would change in a similar fashion. Specifically, even if it is universal for each person to confront the institutions of work

and family, there is no universal way in which each person negotiates these life tasks. For the social investment principle to play out in normative changes in personality traits, we expect that a preponderance of people would confront these universal tasks, but not all people and not all people in the same way. Thus, the evidence provided above for the existence of individual differences in personality trait change is consistent with the social investment perspective. Not everyone will change in the same way because not everyone will be engaging in universal tasks in the same way or at the same time. The normative changes that do occur in young adulthood arise because a large portion of the populace is engaging with these universal tasks, and that is enough for longitudinal studies to register normative increases in traits like agreeableness, conscientiousness, and emotional stability.

Second, we would expect that the universal tasks of living involved with personality development, are, for the most part, universal. That is, we would expect a majority of people in a majority of different cultures to go through similar life transitions at roughly the same ages. For example, the average age of marriage across several countries varied from 24 for Croatia to 26 for Germany and Italy. Across the world, the average age of marriage varies from about 20 for less developed countries in Africa, South America, and Asia, to 25 for most developed countries such as those listed above ([Population Reference Bureau, 2000](#)). Similarly, the ages that were subjectively seen as preferable and normative to leave home, marry, and start a job showed marked similarity between Japanese and American samples ([Plath & Ikeda, 1975](#)). In short the timing of developmental transitions in diverse cultures is quite similar.

Third, we would expect at a minimum that we would find cross-sectional relationships between social investment in universal tasks of social living and personality traits such as social dominance, agreeableness, conscientiousness, and emotional stability. At least initially, there seems to be ample support for this expectation. For example, Organizational Citizenship Behavior, the act of being committed to an organization and job to the point where you promote the company and go beyond the expectations of the job, is positively correlated with conscientiousness ([LePine, Erez, & Johnson, 2002](#)). Moreover, people who are more invested in their work, reflected in a propensity to be emotionally and cognitively committed to work, tend to score higher on measures of conscientiousness such as achievement, self-control, and traditionalism ([Roberts et al., 2003](#)).

Similarly, if longevity and stability in interpersonal relationships is viewed as an index of investment in the relationship role, then there is ample support for the social investment hypothesis. People who are more emotionally stable and controlled tend to experience longer and more stable relationships ([Roberts & Bogg, 2004](#); [Robins et al., 2002](#)). In contrast, individuals who are less emotionally stable and less conscientious tend to experience higher rates of divorce ([Cramer, 1993](#); [Kelly & Conley, 1987](#); [Roberts & Bogg, 2004](#)). Within the more social domain of religion, increased commitment and participation in religious systems is positively related to agreeableness and conscientiousness ([Saroglou & Fiasse, 2003](#)).

Fourth, we would expect that experiences within the universal tasks of social living would be associated with changes in social dominance, agreeableness, conscientiousness, and emotional stability. As we noted above, there is now consistent

evidence from longitudinal studies to demonstrate that social investments in work, marriage, and community are related to increases in traits related to social dominance, agreeableness, conscientiousness, and emotional stability. For example, work related experiences are associated with increases in self-confidence, responsibility, and emotional stability in men and women (Clausen & Gilens, 1990; Elder, 1969; Roberts, 1997; Roberts & Chapman, 2000).

More recently, we investigated the relationship between work experiences in young adulthood and change in personality traits in a sample of New Zealander's in the transition from school to work (Roberts et al., 2003). We used the Multidimensional Personality Questionnaire in this study, which taps three domains: Negative Emotionality, Positive Emotionality, and Constraint. The pattern of associations between work experiences and change in personality were strongest for Negative Emotionality and Positive Emotionality traits. Young adults decreased faster in Negative Emotionality if they were in higher-status jobs that were more satisfying and if they achieved financial security. Similarly, young adults increased on traits associated with Positive Emotionality if they were in higher status, more satisfying jobs that provided enough money to make ends meet. Finally, young adults increased on facets of constraint if they were more involved in their jobs and financially secure.

Marital and family experiences also are associated with changes in social dominance, emotional stability, and conscientiousness. Women who did not experience divorce became more dominant in the transition to midlife (Roberts et al., 2002), whereas people experiencing satisfying and fulfilling relationships became more emotionally stable and conscientious (Roberts & Bogg, 2004; Roberts & Chapman, 2000; Robins et al., 2002). Similarly, engaging in a serious partnership for the first time in young adulthood is associated with decreases in neuroticism and increases in conscientiousness (Neyer & Asendorpf, 2001). Beyond the domain of romantic relationships, receiving more support from family members is associated with increases in agreeableness in adolescence (Asendorpf & van Aken, 2003; Branje et al., 2004). These longitudinal studies demonstrate that investment in the conventional roles of work and relationships explains, in part, the increases in social dominance, agreeableness, conscientiousness, and emotional stability found in young and middle adulthood.

Although there is evidence to support the idea that role experiences are the driving force behind personality development in young adulthood, there are some flies in the ointment. For example, despite not being invested in any of the key roles of young adulthood, we have found that college students change in ways quite consistent with the social investment principle (Robins et al., 2001). That is to say, that these students, despite not being married, or working in their career, and not participating directly in the life contexts of adulthood, increased on agreeableness, conscientiousness, and emotional stability, while in college.

Why then, were these students demonstrating personality change in the absence of direct engagement with the universal tasks of living? Clearly, these students were having experiences in college that could have an effect on their personality. For example, students who achieved higher grades increased on conscientiousness, and students who had higher quality interactions with the university increased in agreeableness

and emotional stability (Robins, Nofhle, Trzesniewski, & Roberts, in press). These, however, are not the most provocative findings. In a recent study, we found that, if students held goals for specific roles, such as for marriage, family, and work, and they increased their investment in these goals over time, then they also increased in terms of agreeableness and conscientiousness (Roberts, O'Donnell, & Robins, 2004).

These latter findings point to several interesting implications. First, of course, people can work on the universal tasks of social living in the absence of direct engagement with the roles associated with them. People can think about what it would take to be successful or what it would be like to be married and to have children. What is most interesting, though, is that *thinking* about these life structures may be enough to start the process of personality trait development without direct experience. This begs the question of what mechanism is involved in personality trait change that transcends hypothetical and actual role experiences. Our preliminary answer, and the fifth piece of evidence in support of the social investment principle, is the existence of role expectations and the fact that they may play a role in personality trait development.

As we noted above, the contingencies of social investment come in the form of role expectations for appropriate behavior, which are enforced by the self and from various others to direct a person's behavioral tendencies (Neugarten & Hagestad, 1982; Sarbin & Allen, 1964). People enter a role with a set of expectations for how they should act that are derived from their experiences watching others they know who have acted in the role, such as parents, mentors, and friends (Caspi & Roberts, 1999). This set of expectations takes, in part, the form of a psychological profile that can be described in trait terms. By using a trait nomination procedure to measure role expectations early role researchers found that people collectively expected the typical manager to be *industrious*, *serious*, *fair-minded*, and *tactful* (Sarbin & Jones, 1955). This picture may be widely shared, and the people one encounters may have an interest in the proper enactment of these expectations. For example, a manager may need the employee to get work done promptly for the business to flourish, and the employee's family may collectively need the money from this job to live a comfortable existence. In this manner, acting in a role-appropriate fashion may be encouraged by a number of sources the individual encounters throughout their daily interactions, and enactment or violation of the expectations will likely be associated with consequences of practical importance.

Our fifth hypothesis then is that the personality trait expectations associated with different age groups and age-graded roles (e.g., employee, parent, and spouse) help to direct personality development. If this is the case, we should expect that people's expectations of how different age groups act should be highly correlated with how people actually do change in terms of personality traits. Heckhausen, Dixon, and Baltes (1989) found, for instance that personality traits such as "responsible" and "understanding" were among the traits expected to increase most over the lifespan, which is compatible with the fairly dramatic midlife increases in conscientiousness and agreeableness observed in longitudinal studies. The similarity of this pattern to the pattern identified in longitudinal studies of actual personality development (Roberts & Walton, 2004) suggests that individuals may be generally aware of the typical personality differences that exist between various groups.

We tested this idea more formally in a series of studies in which we asked different groups of students and older acquaintances to describe their expectations in trait terms for four age-graded roles: teenager, college student, young parent, and grandparent (Wood & Roberts, 2004). The level of traits that were expected from typical members of these four different age-graded roles again showed a striking similarity to the pattern of personality trait change found in cross-sectional and longitudinal studies tracking actual changes in personality traits over the lifespan. Emotional stability and agreeableness were expected to be higher in older age groups, and conscientiousness was expected to be substantially higher in later age groups than high school and college students. Interestingly, we even found the curvilinear relationship for intellect expectations which paralleled the finding from a meta-analytic review of personality change, whereby mean-levels of intellect increase until early adulthood and then decrease in later ages.

It is interesting to note that although the *patterns* of change paralleled the patterns found in the mean-level literature, the effect size estimates obtained for differences across the groups were much larger than actual changes in personality traits. For instance, conscientiousness expectations varied by about 40% of the possible scale range in the present study, while means for trait conscientiousness across ages reported by Srivastava and colleagues (2003) varied by about 10% of the possible scale range across the same age span. The smaller variation of traits relative to trait expectations across age groups is consistent with the view of expectations as a force that pulls for the development of enduring characteristics. For instance, responding to the press of new expectations to act affectionately and responsibly upon becoming a parent may eventually result in small changes in the person's general disposition to be agreeable and conscientious (Roberts & Caspi, 2003).

When we separated the effects of role expectations from the effects of age expectations, we found that targets who were married, employed, or parents were expected to be more extraverted, agreeable, conscientious, emotionally stable, and intellectual than targets that were not, especially if the target was in middle adulthood where the roles were normative. While target age continued to influence raters' personality expectations of targets once role effects were methodologically separated from age, the magnitude of the differences in expectations across age groups was significantly lower when role effects were separated. This supports the hypothesis that expectations for behavior that people confront as they age are largely connected to roles such as marriage and employment. However, the finding that personality expectations continue to be related to age even after role effects are separated stresses the sometimes forgotten idea that age itself is a role that people enter and which most likely carries a strong, societally shared set of expectations for behavior (Hagestad & Neugarten, 1985).

These studies on role expectations point to why people who are not actively engaged in the universal tasks of social living may be changing nonetheless. They have a set of expectations for how a married person acts, and when they engage the goal for being married, they also invoke the expectation and subsequently change their personality. This is not to diminish the importance of the actual role expectations that come with the real role later in life. These are formidable change agents

also (Roberts & Caspi, 2003). Clearly, role expectations and age expectations are viable mechanisms that can explain much of the normative changes in personality trait development in young adulthood.

In contrast to the FFT position on personality trait change, there seems to be a wealth of data supporting the social investment perspective on personality trait change. First, individual differences in change do occur, which is more consistent with the Social Investment perspective. Second, universal tasks of social living exist and apparently exist across cultures. Third, cross-sectional patterns of relationships between social investment in universal tasks of social living and personality traits shows that these tasks are associated with elevated levels of social dominance, agreeableness, conscientiousness, and emotional stability. Fourth, the few longitudinal studies that have tracked experiences in social roles have found that normative experiences, such as entering the paid labor market, staying in a stable marriage, and moving up the status hierarchy, are associated with increases in personality traits of social dominance, agreeableness, conscientiousness, and emotional stability. Finally, preliminary research shows that trait-based role expectations exist and look strikingly similar to the patterns of change we find both across age and within specific roles.

Although the evidence supports the social investment perspective on personality trait change, it should be noted that much of the evidence is still preliminary and that more definitive tests of the idea have yet to be provided. For example, most of the longitudinal studies to date have used only crude, demographic measures of role experiences rather than psychological experiences, such as whether people are experiencing a uniform set of expectations for how they should behave. Moreover, our preliminary research on role expectations could simply be revealing the fact that people are sensitive to the changes in personality traits and derive their expectations not from how they want people to behave, but from how people typically behave already. Researchers will need to thus demonstrate that role expectations represent not just accuracy but are also directive forces in personality development. Longitudinal studies will be useful in this regard. For instance, in a longitudinal study of Harvard men we have found that role expectations that one should act warm and friendly as a student have an antecedent influence on the development of traits associated with conscientiousness and agreeableness over the course of three years (Wood, Harms, & Roberts, 2004).

The lack of focused longitudinal studies across different cultures is also a serious impediment to making any strong conclusions about the differential role of environments on personality development. Despite the apparent consistencies in personality trait development found in cross-sectional, cross-cultural studies (e.g., McCrae et al., 1999), we would expect to find subtle, but theoretically sensible differences nonetheless. For example, children are socialized quite differently in many Asian cultures when compared to western cultures. In the west, parents emphasize self-esteem and autonomy. In contrast, parents in certain areas of Asia use more shaming and social comparison techniques to raise their children (Fung, 1999; Miller, Wiley, Fung, & Liang, 1997). One would assume that Asian parenting practices that center more on shame would result in higher levels of conscientiousness at an earlier age, but as yet

there are no longitudinal studies to test this hypothesis. Also, despite the similarity in the normative timing of major life transitions among countries that have been sampled by personality psychologists thus far, significant differences exist in certain countries, and targeting these countries could reveal certain differences in the developmental patterns of personality traits. For instance, about 100 million children aged 5–15 around the world work full time, and in some areas of countries such as India and Pakistan families routinely “bind over” their children to work as a means of obtaining income (Dannefer, 2004; International Labor Organization, 1999). Similarly, in India and Bangladesh, over 50% of the nation’s women are married by age 18, compared to about 10% or less in Western countries (Population Reference Bureau, 2000). In the cultures and subcultures where major life transitions are institutionalized to occur at earlier ages, we may expect to observe the accelerated development of personality traits associated with maturity, such as conscientiousness, agreeableness, and emotional stability (Hogan & Roberts, 2004).

In summary, we have evaluated the evidence in support of two positions on why normative changes in personality traits exist. Clearly more parsimonious, the FFT position that normative development is the result of genetics alone fails to explain a wide range of findings. Although parsimony is a desirable quality in a theory, so is the usefulness of a theory, which is driven in part by its ability to account for the data. On this front, the FFT clearly falls short. In contrast, the position that normative increases in specific trait domains may arise because investments in universal tasks of social living appears to garner much support from a variety of sources. Despite this initial success, it is also clear that the research supporting the social investment position is preliminary, and that much more interesting, and focused developmental research needs to be performed before we have a clearer picture of the forces that guide personality trait change.

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