

PERSONALITY TRAIT DEVELOPMENT AND SOCIAL INVESTMENT IN WORK

BY

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THESIS

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ABSTRACT

A three-year longitudinal study of actively employed individuals ($N = 391$) was used to test the relationship between social investment at work, which is the act of cognitively and emotionally committing to one's job or career, and both cross-sectional and longitudinal patterns of personality trait development. Participants provided ratings of personality and social investment at work at two time-points, separated by approximately three years. Data were analyzed using two-wave latent change models. Results showed that conscientiousness and other personality traits were related to social investment at work. Additionally, evidence was found for a positive association between longitudinal change in social investment in work and change in personality traits—especially conscientiousness. Finally, the concurrent longitudinal changes in social investment and personality traits were invariant across age groups, suggesting that personality traits remain plastic across the lifespan. Implications for personality development and future research directions are discussed.

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CHAPTER 1: BACKGROUND

Personality traits develop according to normative patterns across the lifespan. For example, individuals tend to increase in conscientiousness, agreeableness, and emotional stability well into adulthood (Roberts, Walton, & Viechtbauer, 2006; Srivastava, Oliver, Gosling, & Potter, 2003). In a recent study these same patterns were found in an internet sample of over one million English speaking participants ranging in age from 10 to 65 from across the globe (Soto, Oliver, Gosling, & Potter, 2011). It appears that this pattern, described as maturity (Roberts & Wood, 2006) is widely evidenced across most industrialized countries.

The most common question that follows the realization that personality traits continue to grow and develop in adulthood is, “why?” One initial perspective argued that the near universal nature of these patterns of personality development would mean that genetic factors and only genetic factors could explain personality trait change in adulthood (McCrae & Costa et al., 2000). Though personality change is heritable (Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2009; Hopwood, Donnellan, Blonigen, Krueger, McGue, Iacono, & Burt, 2011), like most other psychological phenomena, it is only partially heritable, with over half the variance in personality trait change attributable to the environment. Moreover, multiple studies have shown that subpopulations of individuals change in the opposite direction of the norm. For example, individuals who continue to smoke marijuana into adulthood also fail to increase on conscientiousness (Littlefield, Sher, & Wood, 2010; Roberts & Bogg, 2004). Thus, the argument that personality trait change is driven entirely by genetics is untenable.

Alternatively, researchers have searched for and theorized about environmental factors that may be responsible for personality trait development. For example, the neo-socioanalytic model of personality trait development suggests that commitment to and investment in adult

roles—like shared genetics—is nearly universal, and may be one reason for personality trait change in adulthood (Roberts & Wood, 2006; Roberts, Wood, & Smith, 2005). This transition from the freedom of adolescence to the responsibilities of adulthood has been described as the process of social investment (Lodi-Smith & Roberts, 2007). To date, most evidence for the effect of social investment has been inferred from past research that was not designed to explicitly test the idea (cf., Lenhart, Neyer, & Eccles, 2010). The primary purpose of this study is to test whether changes in work-related social investment predict changes in personality traits.

Social investment and its association with personality change

As alluded to above, social investment reflects the commitment most people make to adult social roles as they transition from their provisional status as an adolescent and young adult into a full-fledged adult, both in their own eyes and the eyes of their society (Lodi-Smith & Roberts, 2007). The process of social investment is presumed to be universal, and therefore normative (Helson, Kwan, John, & Jones, 2002). That is, most individuals in most societies commit themselves to the adult roles found in the social structures of family, work, and community. Moreover, despite the heterogeneity in the roles found in these social institutions, most are assumed to contain similarities in terms of the mechanisms that would contribute to personality change. Specifically, social roles contain expectations that are widely held by most age groups in society (Wood & Roberts, 2006). Therefore, people anticipate changes in behavior that will be necessitated as they enter new roles, such as taking their first career-related job or becoming a parent for the first time (Roberts & Wood, 2006). Moreover, others will promote and reward these changes because they share the expectations with the role participant. Finally,

new roles come with explicit experiences, rewards, and punishments that lead to changes in thoughts, feelings, and behaviors, which translate into personality change over time.

To the best of our knowledge, Lehnart and colleagues (2010) provided one of the first explicit tests of social investment processes. They found that young adults who became increasingly socially invested in romantic relationships over time experienced simultaneous increases in emotional stability and self-esteem. Complementarily, they also found support for de-investment processes. A de-investment process occurs when individuals who fail to invest in socially normal ways also fail to experience normative personality changes (Roberts, Walton, Bogg, & Caspi, 2006). For example, Lehnart and colleagues found that individuals who remained single for extended periods of time—thereby failing to invest in romantic relationships—did not display normative increases in self-esteem or emotional stability over time.

These very same social investment (and conversely, de-investment) processes that occur in romantic relationships are also expected to occur in other life domains. Specifically, Lodi-Smith and Roberts (2007) found, via meta-analysis, that personality traits were correlated with social investment in four key life domains: (i) close relationships, (ii) work, (iii) community involvement, and (iv) religion. To date, the social investment process has only been explicitly tested in the context of close relationships. The primary purpose of this study is to examine social investment in a second domain—the workplace—as a potential process by which personality traits change.

What does social investment at work look like? As aforementioned, social investment involves committing deeply to adult roles. As such, social investment in work involves assuming an identity as an employee and forming deeply committed, meaningful bonds with

various aspects of one's workplace. As such, individuals who are socially invested in their careers should be more likely to follow workplace norms, be good citizens, and embrace their career-oriented identity. Many existing measures used in the literature tap into these constructs. For example, Kanungo's (1982) job involvement scale directly assesses the career-centricity of individuals' lives. Other measures, such as organizational citizenship behaviors (Smith, Organ, & Near, 1983) assess prosocial behavior at work, which represents a deep commitment to one's career role. Conversely, counterproductive behaviors at work (Bennett & Robinson, 2000) seem to characterize individuals who are de-invested and not committed to their careers. Strictly speaking in terms of existing measures, someone who is deeply socially invested in work would be characterized by high job involvement and organizational citizenship behaviors, and low levels of counterproductive behaviors.

We would expect that as individuals become increasingly invested in and committed to their careers that they should experience changes in their personality traits that accommodate the demands of their workplace. Of all of the Big Five personality traits, conscientiousness is empirically and theoretically most linked to performing well in workplace contexts (Judge, Higgins, Thoresen, & Barrick 1999). As such we would expect that increasing social investment at work would lead to increases in conscientiousness over time. Current cross-sectional studies provide evidence that this may, in fact, be the case. First, in cross-sectional studies, personality has been linked to many indicators of social investment in the workplace. For example, personality is related to career success (Judge, Heller, & Mount, 2002; Judge et al., 1999). Conscientiousness, in particular, has strong relationships with many important work outcomes, including occupational attainment and job involvement (Roberts, Caspi, & Moffitt, 2003; Lodi-Smith & Roberts, 2007; Judge et al., 1999). Second, longitudinal studies have linked workplace

experiences to actual changes in personality traits over time. For example, Roberts (1997) found that working women become more agentic and norm-adhering over time compared with their non-working peers. Other studies have shown that occupational attainment and work satisfaction are related to long-term changes in both negative- and positive-emotionality (Roberts et al., 2003), as well as increases in extraversion and emotional stability (Scollon & Diener, 2006). Finally, Roberts and colleagues (2006) found that repeated patterns of antisocial or counterproductive behaviors at work predict subsequent decreases in conscientiousness and emotional stability over time. This effect is notable in its similarity to the de-investment processes observed by Lehnart et al. (2010).

For theoretical and practical reasons the direct empirical tests of the social investment process have focused on young adulthood. The fact that most individuals make the transition to adult roles in young adulthood combined with the fact that it is during this time that we find the most normative changes in personality traits has made this an obvious age period on which to focus. Furthermore, most longitudinal studies track single cohorts over several years, which has prevented an examination of the relation between social investment experiences in other periods of the life course. As a consequence of the focus on young adulthood, very few studies have examined whether changes in social investment continue to occur throughout the lifespan, or whether they attenuate quickly after young adulthood.

The current study permits an examination of the relation between social investment at work and personality change across several age periods in adulthood. What should we expect to find in terms of differential patterns across age? Predictions differ depending on the underlying model of life-span development. In one perspective, younger people are more susceptible to the influence of the social environment and thus more likely to change in response to it (Elder, 1979;

Stewart & Healy, 1989). For example, Elder (1979) showed that younger children were more likely to be adversely affected by the great depression than their older siblings. Similarly, it is thought that social attitudes, such as political ideology, are more likely to be shaped by the social environment in young adulthood (Cornelis, Van Heil, Roets, & Kossowska, 2009; Duncan & Agronick, 1995). Based on this model of life-span development, we would expect social investment in work to have its effect predominantly in young adulthood which would be reflected in the relation between social investment and change in personality traits being stronger in young adults than older cohorts. Alternatively, according to Baltes's (1987) perspective on life-span development, personality remains an open system throughout adulthood. If this is the case, then it is possible that social investment experiences at work may be equally important for personality change in middle age than in young adulthood. As several studies have found that work experiences continue to be associated with personality trait change in middle age (Branje, van Lieshout, & Gerris, 2007; Roberts, 1997; van Aken, Denissen, Branje, Dubas, & Goossens, 2006), the prevailing empirical foundation is unclear. Given the lack of data and the mixed findings to date, we examine whether age moderates the relation between social investment patterns in work and personality trait change.

The present study

The present study utilizes a longitudinal design with an age-stratified sample in order to examine the relationships between work-related social investment and personality traits. The longitudinal design allows us to examine both cross-sectional relationships between the variables, as well as change in the variables over time. To examine social investment at work, we used a combination of several variables that indicate investment at work (job involvement,

organizational citizenship behavior) and, conversely, de-investment at work (counterproductive behaviors at work). Job involvement and organizational citizenship behaviors reflect thoughts, feelings, and behaviors representative of individuals who are deeply committed to their career roles. Conversely, counterproductive behaviors are indicative of individuals who are detached, or uninvested in their careers. The age-stratified sample provides the opportunity to test whether age moderates the relationship between changes in social investment and changes in personality traits.

CHAPTER 2: METHOD

2.1 Participants

Participants were drawn from a larger study of 613 (43% male) randomly selected individuals from the State of Illinois who provided two waves of longitudinal data over the course of three years (The Health and Aging Study of Central Illinois: HASCI). Participants were sampled using multistage, age-stratified random selection techniques. In the first sampling stage, nine Illinois counties were selected using probabilities proportionate to size (PPS). PPS weights the probability of a county being selected for inclusion in the study by its total adult population. This procedure provides a higher probability of sampling more populous counties, while allowing all counties some chance of being selected. In the second stage, five census tracts were selected from each sampled county using PPS. In stage three, four city blocks were sampled using PPS from each selected census tract. Finally, within each city block, five houses were randomly selected to be included in the study.

To ensure an age-stratified sample, three target age groups were identified: 20- to 39-year olds, 40- to 59-year olds, and persons over 60 years of age. To obtain an equal number of participants within each age strata, selection of households within blocks was adjusted to oversample the smallest represented strata in the area. Researchers visited each selected household up to ten times to contact the residents, after which the household was recorded as a noncontact.

Twice, separated by three years, selected participants completed an online battery of personality measures and were given face-to-face interviews in their homes by the Survey Research Lab of the University of Illinois, Chicago. Participants were given a \$15 gift card as reimbursement for their time. Total response rate, calculated as completed interviews divided by

the sum of total interviews, refusals, noncontacts, and households within the block with unknown eligibility, was 18.5%. Total refusal rate was 21.5%.

We focused on a subsample of the HASCI Statewide sample that was younger than 65 and working at both time points¹. Since we were interested in individual differences in longitudinal change in social investment at work, we only analyzed data from participants who were employed. At time 1, 391 (64%) participants were 65 years old or younger and had jobs. Of these participants, 182 (47%) also provided data at time 2. With respect to all variables that we examined, *t*-tests revealed that participants who provided data at both time points did not significantly differ from participants who dropped out of the study, all *ps* > .05.

Of the 182 participants who were working at the first assessment and then provided data at the second assessment, 36 had retired or were temporarily out of work at time 2, and therefore did not complete measures of social investment at work. A total of 146 (47% male) participants were employed at both time points. Our growth models used full information maximum likelihood (FIML) estimation, which was able to use all 391 data points (employed at least at time 1). In the first wave of the sample, included participants' ages ranged from 19 to 65 years ($M = 39.53$, $SD = 11.95$). The racial distribution of the final sample approximated the racial distribution of the state of Illinois. Seventy-four percent of the participants were Caucasian, 13.7% were African American, and 6.5% were Asian American.

2.2 Measures

Personality. Participants provided self-report ratings of their personality traits using an abbreviated version of the AB5C (Goldberg, 1999). Participants rated statements about

¹ For an examination of social investment processes in the old age subsample, see Lodi-Smith & Roberts, in press.

themselves on a scale of 1 (Very Inaccurate) to 5 (Very Accurate). Conscientiousness was measured as a composite of nine facet scales (conscientiousness, efficiency, dutifulness, purposefulness, organization, cautiousness, rationality, orderliness, perfectionism), each containing 9 to 13 items. Extraversion, agreeableness, emotional stability, and openness were each measured with a 10 or 11 item indicator facet: gregariousness, understanding, stability, and intellect, respectively. Reliabilities were satisfactory for each scale, ranging from .77 to .84.

Job Involvement. Participants completed the ten-item Job and Work Involvement Scale (Kanungo, 1982). Each item was rated on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). Prototypical job involvement items were, “I am very much involved personally in my job,” and “Most of my interests are centered around my job.” Reliability for this scale was .82.

Organizational Citizenship Behaviors. Thirteen items assessed participants’ organizational citizenship behaviors (Smith et al., 1983). For each item, participants rated how frequently they performed certain behaviors on a scale from 1 (Never) to 4 (Once a month) to 7 (Several times per day). Organizational citizenship behaviors are prosocial, pro-organizational behaviors; the scale included items such as, “was respectful of others’ needs while at work,” “displayed loyalty to the company,” and “went out of my way to do the things a ‘good’ employee would do.” Reliability for this scale was good ($\alpha = .86$).

Work Investment. Six items assessed participants’ work investment on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Sample items included, “I feel a strong sense of obligation toward my work,” and, “I consult my coworkers before making important changes in my life.” Alphas were adequate, ranging from .60 (time 1) to .67 (time 2). To avoid confusion, we refer to this six-item scale as *work investment*, and use the terms *social investment at work* or *work social investment* to refer to all four social-investment variables (job involvement,

organizational citizenship behaviors, work investment, and counterproductive behaviors) collectively.

Counterproductive Behaviors at Work. Counterproductive behaviors at work were measured using Bennett and Robinson's (2000) scale. For each item, participants rated how frequently they performed certain behaviors on a scale from 1 (Never) to 4 (Once a month) to 7 (Several times per day). Counterproductive behaviors included antisocial behaviors such as, "talked badly about people behind their backs," as well as behaviors that impede the fluid operation of the company, including "used office supplies without permission" and "ignored a supervisor's instructions." Reliability for the scale was $\alpha = .80$.

2.3 Analyses

Latent Change Models. We used latent change models to examine the associations between personality and work-related social investment, as well as the concurrent longitudinal change between personality and social investment. A latent change model uses two waves of data to estimate the intercept and slope of a variable over time, controlling for measurement error. This allows us to calculate latent estimates of the correlations among intercepts and slopes (McArdle, 1989). In the models, we specified that the intercept be centered at time 1, thus the correlation between intercepts and slopes would be considered prospective. Additionally, latent change models use FIML estimation to fit the models directly to the raw data. This allows estimation of the model parameters using all available data (Hox, 2000). This is preferable to procedures that use only complete case data or data imputation, which can lead to biased estimates (Wothke, 2000). Figure 1 contains the latent change model used in the present study.

A benefit of the latent change model is that it lets us simultaneously estimate the latent correlation between levels at time 1 of personality and social investment (path *A* in figure 1), the prospective relation between levels at time 1 and change over time (paths *B* in figure 1), as well as the simultaneous latent change between personality and work-related social investment (path *C* in figure 1), all uncontaminated by measurement error. We controlled for age as a covariate in all of our models, which allowed us to ascertain the change in personality and social investment above and beyond the effects of maturation. This was accomplished by adding age into the model as an exogenous variable that simultaneously predicted personality slope and intercept and social investment slope and intercept.

CHAPTER 3: RESULTS

3.1 Evidence for personality development

Table 1 contains the descriptive statistics for all personality and social investment at work variables, as well as their correlations with age. As expected, we found cross-sectional evidence for normative personality development. Age was significantly associated with extraversion ($r = -.11, p < .05$), agreeableness ($r = .20, p < .05$), conscientiousness ($r = .20, p < .05$), and emotional stability ($r = .15, p < .05$), but not openness to experience ($r = -.02, p = .40$). This is consistent with the personality development literature, which suggests that individuals become more agreeable, conscientious, and emotionally stable, and less extraverted with age (Soto et al., 2011). Longitudinally, significant mean-level changes were observed for agreeableness ($d = -0.59, p < .05$) and openness ($d = 0.16, p < .05$), but not for extraversion ($d = -0.10, p = .06$), conscientiousness ($d = -0.03, p = .36$), or emotional stability ($d = -0.05, p = .18$). Our subsequent analyses examine the *variance*, or individual differences, in change, which focus on why some people increased or decreased around these overall trends, or lack thereof.

We also found normative patterns for social investment at work. Older adults tended to perform more organizational citizenship behaviors ($r = .12, p < .05$) and fewer counterproductive behaviors ($r = -.11, p < .05$) at work. No significant relationship between age and job involvement ($r = .08, p = .13$) or work investment ($r = .05, p = .40$) was found. Taken together, these cross-sectional results suggest that adults may become increasingly socially invested at work as they age. We found no significant longitudinal mean-level changes in social investment at work over the course of three years (all $|d/s| < 0.06, ps > .20$).

3.2 *Are changes in work social investment related to changes in personality traits?*

To examine the relationships between personality traits and work social investment, we constructed latent change models. In our preliminary models, all of the social investment at work variables were used to estimate a single latent variable representing composite social investment at work. Five models were constructed to examine the relationship between composite social investment at work and the five personality factors. Subsequently, separate models were constructed to examine the relationship between each personality trait and each individual work social investment variable. Each model estimated slopes and intercepts for the latent personality and social investment variables. The intercepts are equivalent to the latent scores on the variable at time 1. The slopes are equivalent to the latent difference scores between time 2 and time 1 (latent T2 – latent T1). Model fit was good for the composite social investment models (all RMSEAs < .07, CFIs > .91), and even better for the relatively simpler individual social investment variable models (all RMSEAs < .05, CFIs > .96). Table 2 contains the estimated correlations at time 1 between personality and both the composite social investment work and the specific measures making up the composite (i.e., the correlated intercepts; path A in figure 1). At time 1, our composite measure of social investment at work was positively related to extraversion ($r = .14, p < .05$), agreeableness ($r = .14, p < .05$), conscientiousness ($r = .23, p < .05$), and emotional stability ($r = .13, p < .05$). The composite measure of social investment was unrelated to openness.

Before testing for the relation between individual differences in change and life experience, like social investment, it is appropriate to first test whether there is statistically significant variation in individual differences in change. In this case, we checked for significant individual differences in change by testing for statistically significant variance in the latent slope

parameters. This requirement was met, as we found significant variance in the slopes for the global social investment composite, all of the specific measures of work social investment, as well as for the personality variables (all $ps < .05$). Thus, ample individual differences in change existed in both sets of variables that could be predicted.

In predicting changes in personality and social investment in work, we first tested whether personality levels at time 1 predicted subsequent growth in work social investment or vice versa. In terms of the relation between work social investment level and personality slope variance, these analyses test whether work experiences at time 1 prospectively relate to changes in personality (path B_2 in figure 1). Conversely, the relation between personality level at time 1 and subsequent work social investment slope variance tests whether personality level predicts subsequent change in work (path B_1 in figure 1). We found no statistically significant prospective relations between personality intercepts at time 1 and change in social investment over time. We also found no prospective relations between work social investment intercepts (time 1) and change in personality traits over time (slope of personality).

Second, we tested whether change in work social investment was correlated with change in personality traits over time by correlating the latent slope parameters from both sets of variables (path C in figure 1). These analyses tested whether individual differences in work social investment change were associated with individual differences in personality trait change over time. These analyses revealed numerous patterns of correlated change between personality traits and work social investment variables over time. Table 3 contains the correlated change between social investment in work and personality. Changes in overall levels of social investment at work were positively related only to changes in conscientiousness ($r = .19, p <$

.05), but were unrelated to changes in extraversion, agreeableness, emotional stability, or openness, all $ps > .05^2$.

To test whether the associations between overall social investment and personality differed across the specific measures of social investment and personality, we ran latent growth models with each specific measure of social investment at work and each of the Big Five. As seen in Table 2, at time 1, conscientiousness was correlated with three of the four work social investment variables. More conscientious people at time 1 reported higher organizational citizenship behaviors ($r = .40, p < .05$) and work investment ($r = .26, p < .05$). More conscientious individuals also reported fewer counterproductive behaviors ($r = -.43, p < .05$). As expected, extraversion at time 1 was related to variables representing positive affect and strong social ties to work. Specifically, extraverted individuals tended to perform more frequent organizational citizenship behaviors ($r = .20, p < .05$) and be more invested ($r = .17, p < .05$) at work. Higher levels of agreeableness at time 1 were associated with prosocial variables, including increased organizational citizenship behaviors ($r = .61, p < .05$) and work investment ($r = .15, p < .05$), and fewer counterproductive behaviors ($r = -.29, p < .05$). Emotionally stable adults performed more frequent organizational citizenship behaviors ($r = .35, p < .05$) and less frequent counterproductive behaviors ($r = -.35, p < .05$). Finally, higher levels of openness to experience at time 1 related to increased frequency of organizational citizenship behaviors, $r = .29, p < .05$. Taken together, these results replicate many cross-sectional relationships known to exist, especially between conscientiousness and work-related variables.

² It is worth mentioning that the threshold for significant correlations varies by model, due to the fact that each model estimates a separate variance-covariance matrix, and the subsequently estimated standard errors for each correlation differ based on these matrices.

Next we examined the patterns between change in the specific components of social investment at work and change in personality traits. Like the analyses for overall social investment, we did not find any statistically significant paths from levels of personality traits to changes in social investment or levels of social investment to changes in personality traits (B paths) when examining specific variables making up the social investment composite. In contrast, we found numerous relations between changes in personality traits and changes in specific social investment at work variables (C path). Looking at the individual work social investment variables, changes in job involvement correlated positively with changes in openness ($r = .32, p < .05$). Increases in organizational citizenship behaviors were positively associated with changes in conscientiousness over time ($r = .22, p < .05$). Changes in work investment were positively associated with changes and conscientiousness ($r = .27, p < .05$). Finally, changes in counterproductive behaviors were negatively associated with changes conscientiousness over time ($r = -.35, p < .05$).

The correlated change between personality traits and social investment has several possible interpretations (Roberts et al., 2003). The overall direction of change in a specific variable frames the interpretation of the change correlation. For example, if the norm is for people to decrease on a variable, such as neuroticism, then a positive relation between a variable like counterproductive behaviors and changes in neuroticism can mean several things. It could mean that people high in counterproductive behaviors increased in neuroticism, or it could mean that people high in counterproductive behaviors simply failed to decrease as is normal. Graphical representations of the correlated change are helpful in distinguishing between these various interpretations. For purely illustrative reasons and to help interpret the significant

associations between changes in social investment at work and changes in personality, we plotted several associations.

Figure 2 provides an illustration of the relationship between change in conscientiousness and change in work investment over time ($r = .27$). We used the latent difference scores from time 1 to time 2 of work investment and conscientiousness ($d = \text{latent T2} - \text{latent T1}$). The sample was then divided into thirds based on the work investment difference scores. As can be seen in figure 2, the correlated change between conscientiousness and work investment is primarily driven by what appears to be de-investment processes. That is, individuals who decreased most in work investment showed simultaneous decreases in conscientiousness from time 1 to time 2. Conversely, participants who increased most in work investment showed extremely moderate, if any increases in conscientiousness. This same basic pattern occurred for the correlated change between organizational citizenship behavior and conscientiousness ($r = .22$).

Of all of the variables measured in this study, only counterproductive work behaviors showed both investment and de-investment patterns ($r = -.35$). As can be seen in figure 3, participants who increased most in counterproductive behaviors exhibited simultaneous decreases in conscientiousness (de-investment). Complementarily, participants who decreased most in counterproductive behaviors showed concurrent increases in conscientiousness, representing an investment process. Taken together, our results provide evidence primarily for de-investment processes, and more limited evidence for investment processes.

3.3 Do individuals become less plastic with age?

In our second set of analyses, we sought to test whether the association between work social investment and personality trait change was limited to young adults only, or alternatively, whether changes in work social investment were associated with changes in personality traits across the lifespan. To test this, we fit two multiple-groups models. As social investment is thought to predominantly occur in young adulthood we divided our sample into young adults (39 or younger; $n = 191$) and middle-aged adults (40 or older; $n = 200$). In the reduced model, the correlation between social investment intercept and personality intercept (path A in figure 1) was constrained to be equal for both age groups. Additionally, the correlated change between social investment and personality variables (path C in figure 1) was constrained to be equal across the age groups. All reduced models fit well, all $CFI > 0.90$, $RMSEA < .06$. In the full model, these parameters were free to vary across the groups. The CFI and $RMSEA$ for the full models were indistinguishable from those of the constrained models to two decimal places. With one exception, freeing the parameters to vary did not improve the fit of any of the models in terms of χ^2 , all $\chi^2(2) < 5.25$; $p > .05$. The only exception to this rule was the relationship between conscientiousness and counterproductive behaviors. Constraining the correlated change between conscientiousness and counterproductive behaviors to be equal across age groups significantly worsened the fit of the model, constrained model, $\chi^2(2) = 6.85$, $p < .05$. The point estimates of the correlated change for each age group suggest that middle-aged adults who perform counterproductive behaviors exhibit significantly larger decreases in conscientiousness ($r = -.45$) than do young adults ($r = -.37$). This is directly contrary to what we would expect to find if changes in social investment only exerted influence on personality traits in young adulthood.

CHAPTER 4: DISCUSSION AND CONCLUSION

The present study tested whether social investment in work was related to changes in personality traits over time and age. Using cross-sectional data, we replicated normative developmental trends in personality traits. Older individuals tended to be more agreeable, conscientious, and emotionally stable, and less extraverted than younger individuals. Additionally, we found support for developmental trends in social investment at work. Particularly, older adults more frequently engaged in organizational citizenship behaviors, and they performed fewer counterproductive behaviors. Due to the short duration of the study, mean-level longitudinal changes in both personality traits and social investment at work were largely absent from the data. This, however, was not a primary issue because our analyses focused on explaining individual differences, or variance, in personality trait change.

Using latent change models with two waves of longitudinal data, we examined (1) the correlations between personality and work social investment at time 1, and (2) the correlated change between personality traits and social investment at work. We found that extraversion, agreeableness, conscientiousness, and emotional stability were correlated with a composite measure of social investment at work at time 1. This replicated past research showing relationships between personality traits—like conscientiousness—and indicators of social investment at work, such as job involvement (Judge et al., 1999; 2002).

Looking specifically at the correlated change over time between personality traits and social investment, we found that changes in social investment were associated with changes in personality traits. Longitudinal increases in composite measures of work social investment were associated with changes in conscientiousness over time. Examining the specific work-related social investment variables individually, changes in organizational citizenship behaviors, work

investment, and counterproductive behaviors were associated with changes in conscientiousness over time. Increases in job involvement were associated with changes in openness over time. These results demonstrate the developmental relationships between social investment at work and change in personality traits.

Of course, these patterns of association remain correlational in nature, making their causal interpretation ambiguous. We did not find that antecedent standing on either personality traits or work variables predicted changes prospectively. Rather, we found what would be best thought of as simultaneous relations between change in work-related social investment and changes in personality traits over time. This type of finding is most consistent with the idea that changes in personality and changes in work-related experiences are reciprocal in nature, as there is no evidence that personality change precedes changes in work-related experiences or vice versa.

The simultaneity of the association is also consistent with the idea that long-term experiences are a necessary ingredient for personality change, rather than discrete events which subsequently propagate forward in time (Roberts, 2006). The latter type of effect would be consistent with the intercepts at time 1 predicting subsequent changes, which was not supported by our results. Although the assumption that discrete events exert paramount influence in change processes is a common feature of quasi-causal panel models, it is also a problematic assumption. Such an assumption implies that distal experiences at work are more important in shaping one's current personality than more recent events. There is little or no compelling conceptual reason to assume that events far in the past would take precedence over more recent changes in one's work environment. Setting aside these philosophical arguments, it is clear that determining the causal priority of change in personality or change in work experiences will await

more systematic, experimental approaches. For example, many organizations place employees in training programs or morale building exercises, which should ostensibly lead to changes in work-related behaviors that, in turn, could be related to changes in conscientiousness. One would assume that safety training or team building exercises would be ideal candidate interventions to be tested in experimental or quasi-experimental designs to see if they affect change in personality traits as well as changes in work-related behaviors.

Finally, we found that age did not moderate the relationship between social investment at work and personality traits. That is, irrespective of age, changes in individuals' workplace environments predicted simultaneous changes in their personality traits. The fact that subjective ratings of work social investment continued to predict personality trait change beyond young adulthood holds important theoretical implications for how personality is conceived. The empirical topography of personality theory must start with the fact that personality traits become increasingly consistent with age (Roberts & DelVecchio, 2000). In one model, this increasing consistency is a result of personality becoming increasingly calcified and thus resistant to change regardless of what the external press may be (McCrae & Costa, 1999). Under this model, one would expect the correlation between changes in social investment and changes in personality to diminish with age as the variability in personality change diminishes. Our findings did not support this model. Alternatively, Baltes (1987) argued that the personality was an open system and remained open to the influence of the environment. This provides a different perspective on the increasing consistency that comes with age and the relation between life experiences and personality change. Rather than personality having "critical periods" or becoming calcified at a later age, it is the increasing stability of the environment that presses less for change as people age that is the cause of increasing personality continuity. According to this view, the

environmental demands that precipitated trait change earlier in the life course eventually promote trait stability, once individuals reach equilibrium with the environmental demands. The fact that changes in subjective ratings of social investment retain their ability to predict personality change in middle age supports the latter model of personality development, as the covariance between changes in work experience and trait change remains equally strong (or, in the case of some counterproductive behaviors, becomes stronger), even if the sheer amount of change experienced in work decreases with age.

Limitations and Future Directions

One of the major limitations of the present study is that we assessed changes in work social investment as a subjective variable rather than as an objective transition. That being said, investment is intrinsically a psychological variable and demographic measures often fail to capture the important features of life experiences that may be related to psychological development (Roberts et al., 2003). This is compounded by the fact that our sample was age stratified and did not focus exclusively on a sample of individuals traversing the transition from adolescence to young adulthood, in which both demographic and subjective changes occur in combination. Due to these factors, it is still possible that work-related social investment, when assessed more thoroughly with a more focused age range, would reveal stronger associations with personality change in young adulthood than old age.

Furthermore, while we were able to detect significant individual differences in changes in personality traits and social investment variables over time, the present study lacked a sufficient duration to find significant mean-level longitudinal changes in personality traits and social investment variables.

Future research should examine social investment processes over a longer period of time in order to be able to examine mean-level changes in personality traits and social investment. This would bolster claims that more social investment occurs in young adulthood than in later years, which, in turn, precipitates the great amount of personality change typically observed during young adulthood. Additionally, a finer temporal resolution (i.e., more frequent data points) would be helpful for teasing apart the immediate versus delayed effects of social investment. Future studies also would benefit from more objective measures of social investment. Peer and supervisor ratings of investment at work would likely provide results convergent with self-report. However, observer-ratings may provide insights that are not easy to ascertain via self-report data. Ideally, the claim that social investment causes trait change should be demonstrated experimentally. However, social investment is a primarily self-directed, willful commitment to societal structures. In this sense, it would be very difficult to manipulate directly. Longitudinal quasi-experimental field studies in the workplace may be the best route to strengthen claims that social investment causes changes in personality, as opposed to the two possessing a spurious relationship due to confounds such as third variables, history, or maturation.

Conclusion

Social investment—the process of becoming invested in and committed to adult roles—shows promise of being a viable personality development mechanism. It has been linked to predictable personality trait change in a variety of contexts, including in relationships (Lehnart et al., 2010), and, in the present study, in the workplace. Moreover, the present study provides the first evidence that social investment processes are not limited to young adulthood. Changes in

social investment may influence personality trait development well into old age. Taken together, these results suggest that understanding the roles that people commit to, and the environments they find themselves in, is crucial for understanding how their personalities develop across the lifespan.

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APPENDIX A: TABLES AND FIGURES

Table 1. Descriptive Statistics for Personality and Social Investment

	Time 1 (n = 391)		Time 2 (n = 146)		<i>r</i> _{age,T1}
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Extraversion	3.11	0.79	3.04	0.78	-.11*
Agreeableness	4.22	0.53	4.23	0.58	.20*
Conscientiousness	3.91	0.52	3.87	0.50	.20*
Emotional Stability	3.46	0.68	3.44	0.74	.15*
Openness	3.66	0.60	3.72	0.61	-.02
Job Involvement	2.99	0.78	2.98	0.78	.08
Organizational Citizenship	2.18	0.84	2.15	0.76	.12*
Work Investment	3.77	0.59	3.80	0.59	.05
Counterproductive Behaviors	5.65	0.77	5.55	0.78	-.11*

Note. * $p < .05$

Table 2. Correlation Between Latent Personality Level and Latent Work Level

	SI	JI	OCB	WI	CPB
Extraversion	.14*	-.01	.20*	.17*	.02
Agreeableness	.14*	-.11	.61*	.15*	-.29*
Conscientiousness	.23*	.09	.40*	.26*	-.43*
Emotional Stability	.13*	-.01	.35*	.08	-.35*
Openness	.07	-.10	.29*	.04	-.10

Note: * $p < .05$; SI = social investment at work composite; JI = job involvement;

OCB = organizational citizenship behaviors ; WI = work investment; CPB = counterproductive

behaviors at work

Table 3. Correlation Between Latent Personality Change and Latent Work Change

	SI	JI	OCB	WI	CPB
Extraversion	.06	.01	.11	.06	-.09
Agreeableness	.15	.01	.13	.25	-.08
Conscientiousness	.19*	.11	.22*	.27*	-.35*
Emotional Stability	0	-.05	.11	.03	-.11
Openness	.24	.32*	.21	.16	-.25

Note: * $p < .05$; SI = social investment at work composite; JI = job involvement;

OCB = organizational citizenship behaviors ; WI = work investment; CPB = counterproductive behaviors at work

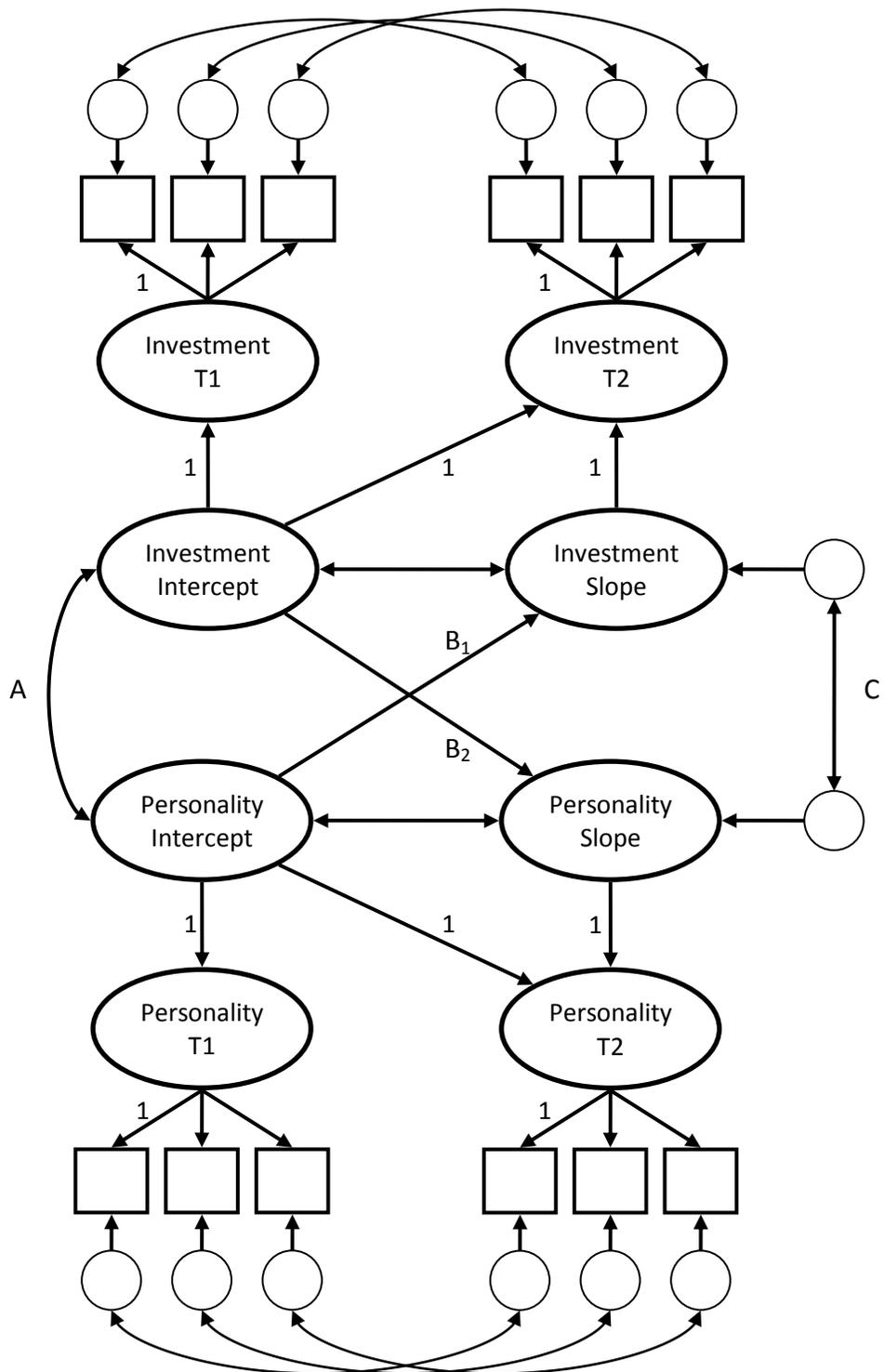


Figure 1. Latent change model.

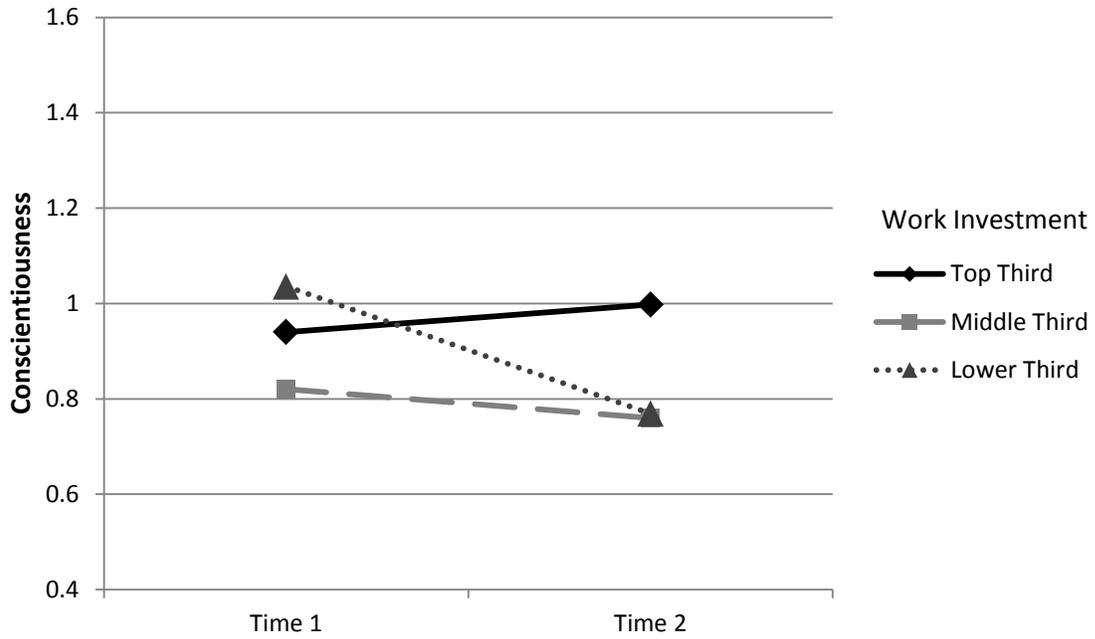


Figure 2. Latent conscientiousness scores at time 1 and time 2 as a function of latent work investment slope, slope = latent T2 – latent T1.

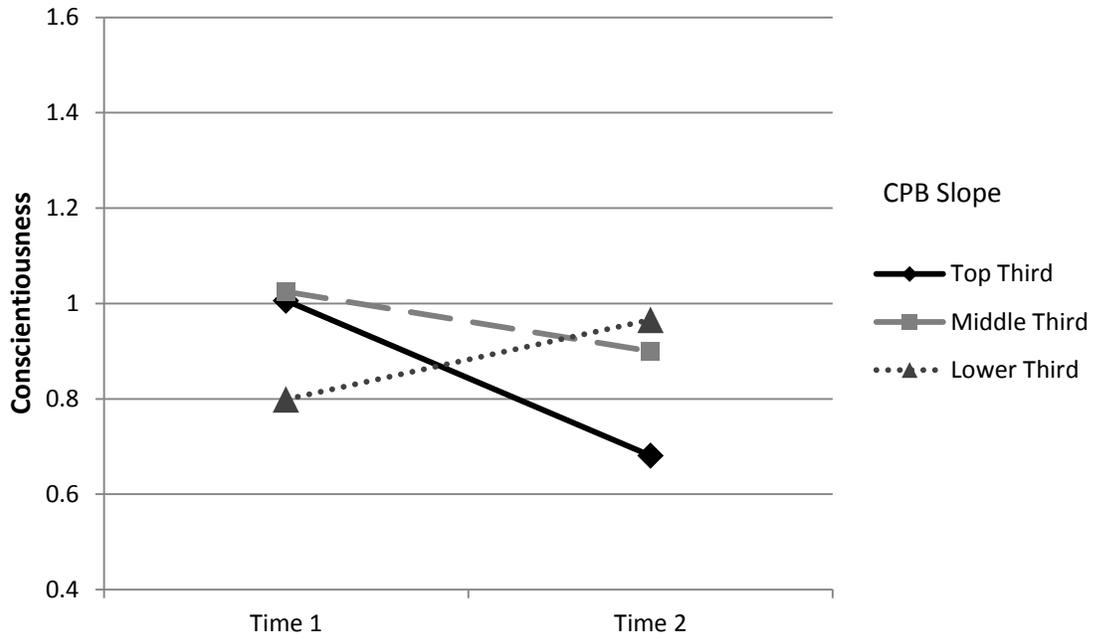


Figure 3. Latent conscientiousness scores at time 1 and time 2 as a function of counterproductive behaviors (CPB) slope, slope = latent T2 – latent T1.