

## De-investment in Work and Non-normative Personality Trait Change in Young Adulthood

BRENT W. ROBERTS<sup>1\*</sup>, KATE WALTON<sup>1</sup>, TIM BOGG<sup>1</sup>  
and AVSHALOM CASPI<sup>2,3</sup>

<sup>1</sup>University of Illinois, Urbana-Champaign, IL, USA

<sup>2</sup>Institute of Psychiatry, King's College London, London, UK

<sup>3</sup>University of Wisconsin-Madison, WI, USA

### Abstract

*The present study investigated the relationship between experiences of de-investment in work and change in personality traits in an 8-year longitudinal study of young adults (N = 907). De-investment was defined as participating in activities that run counter to age-graded norms for acceptable behaviour. De-investment in work was operationalised with a measure of counterproductive work behaviours (CWBs), which included actions such as stealing from the work place, malingering and fighting with co-workers. CWBs were used to predict changes in personality traits from age 18 to age 26. Consistent with hypotheses, greater amounts of CWB was associated with changes in the broad trait domains of negative emotionality and constraint. Copyright © 2006 John Wiley & Sons, Ltd.*

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### INTRODUCTION

There is now a growing body of evidence showing that personality traits continue to develop after childhood, with more pronounced levels of change occurring in young adulthood (Roberts, Walton, & Viechtbauer, 2006). Viewed from the perspective of the Big Five taxonomy of traits, people tend to become more agreeable, conscientious and emotionally stable with age. Extraversion shows clear developmental patterns when split into the two constituent elements of social vitality (sociability) and social dominance (Helson & Kwan, 2000). People tend to decrease on social vitality and increase on social dominance (Roberts et al., 2006). Openness to experience shows the most complex pattern of change, as it tends to increase in adolescence and decrease in old age, demonstrating a curvilinear relationship with age (Roberts et al., 2006). These normative developmental changes in personality functioning have been observed in multiple birth cohorts and

\*Correspondence to: Brent W. Roberts, Department of Psychology, University of Illinois, 603 East Daniel Street, Champaign, IL 61820, USA. E-mail: broberts@s.psych.uiuc.edu

nations, using both longitudinal and cross-sectional research designs (Helson, Jones, & Kwan, 2002; McCrae et al., 2000; McGue, Bacon, & Lykken, 1993; Roberts, Caspi, & Moffitt, 2001; Roberts, Helson, & Klohnen, 2002; Robins, Fraley, Roberts, & Trzesniewski, 2001; Scollon & Diener, in press; Srivastava, John, Gosling, & Potter, 2003). Overall, there appears to be more mean-level change occurring in young adulthood than any other period of the life course.

The obvious question that arises from these patterns is why do personality traits change, especially in young adulthood? A Sociogenic framework hypothesises that personality changes occur predominantly in young adulthood because of the universal tasks of social living, such as establishing one's own career and family (Helson, Kwan, John, & Jones, 2002). More specifically, personality traits may show normative trends because of the *social investment principle* (Roberts, Wood, & Smith, 2005; Lodi-Smith & Roberts, 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. Two 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. Second, these social roles come with their own set of expectations and contingencies that call for behaving in a certain fashion. For example, people hold very specific expectations for personality trait norms that are role- and age-graded that tend to match the normative changes seen in personality traits, especially in young adulthood (Lodi-Smith & Roberts in press; Wood & Roberts, in press). Specifically, people who occupy normative roles at appropriate ages, such as being married and working in young adulthood, are expected to be more conscientious, agreeable and less neurotic. Presumably, people will come to their age-graded roles 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 according to the extent to which they are in accord with those expectations (Cialdini & Trost, 1998).

The first implication of the social investment principle is that investments in conventional social institutions, such as age-graded social roles associated with work and marriage should be related to increasing scores on traits such as agreeableness, conscientiousness and emotional stability (Lodi-Smith & Roberts, in press). A series of studies has shown that investments in conventional social roles are associated with increases in these traits. 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; Scollon & Diener, in press). Specifically, increases in emotional stability are associated with being in higher-status jobs that were more satisfying (Roberts, Caspi, & Moffitt, 2003; Scollon & Diener, in press). Similarly, increases in conscientiousness occur when people are more involved in their jobs and financially secure (Roberts et al., 2003).

Marital and family experiences also are associated with changes in 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, Caspi, & Moffitt, 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). These longitudinal studies demonstrate that investment in the conventional roles of work

are associated with the increases in agreeableness, conscientiousness and emotional stability found in young and middle adulthood.

A second implication of the social investment principle is that not all people invest in conventional social institutions in young adulthood. Although the normative press is fairly robust, certain individuals may choose to shun the press to settle down and commit to conventional activities. In fact, certain individuals may actively pursue alternative identities in which they 'de-invest' in social institutions. For example, we found in previous longitudinal research that women who were not in stable marriages (e.g. divorced) were more likely to decrease on measures of conscientiousness (Roberts & Bogg, 2004). Although divorce is much more accepted than it was in the past, it is still non-normative and represents a disengagement from the conventional social institution of marriage. Analogously, certain activities in the work role reflect an active eschewal of the normative press of the role. Specifically, counterproductive work behaviours (CWBs) which include activities such as theft, white collar crime, absenteeism, tardiness, drug and alcohol abuse, disciplinary problems, accidents, sabotage, sexual harassment and violence (Ones, 2002), represent activities that run counter to the norm of being conscientious in work (Wood & Roberts, in press). In the present study, we test the relationship between CWBs and change in personality in young adulthood. We expect that exhibiting CWBs will be associated with non-normative changes in personality traits, such that these individuals will be more likely to decrease in traits related to the domains of emotional stability, conscientiousness and agreeableness.

In this paper, we test the idea of de-investment using the data from the Dunedin Multidisciplinary Health and Development Study (Silva & Stanton, 1996). Specifically, we test whether CWBs are related to non-normative changes in personality traits. To assess change in personality traits, we draw upon self-reported personality assessments gathered at age 18 and age 26 using the Multidimensional Personality Questionnaire (MPQ, Tellegen, 1982). The MPQ includes measures that assess the facets of emotional stability, conscientiousness and agreeableness. Specifically, these scales are found in the superordinate MPQ domains of Negative Emotionality, Constraint and Positive Emotionality. In Tellegen's system, Negative Emotionality includes aggressiveness, which is typically a marker of low agreeableness/emotional stability in the Big Five framework. Negative Emotionality also includes dimensions that assess the anxiety and alienation common to measures of emotional stability. The Constraint domain includes a subset of measures common to the domain of conscientiousness that emphasises the impulse control and conventionality aspects of conscientiousness over the typical orderliness and achievement components of conscientiousness (Roberts, Chernyshenko, Stark, & Goldberg, 2005). We also examine the relations between de-investment and the Positive Emotionality domain of the MPQ. The one specific dimension that we expect to be related to de-investment is the Social Closeness scale, which measures a blend of agreeableness and sociability (Church, 1994). We had no *a priori* hypotheses for the remaining scales from the Positive Emotionality domain, as social investment and counterproductive work behaviours have yet to be shown to be related systematically to this domain (i.e. well-being, social potency and achievement).

## METHOD

### Participants

Participants are members of the Dunedin Study (see Silva & Stanton, 1996), a longitudinal investigation of the health and behaviour of a complete cohort of consecutive births born

between 1 April 1972 and 31 March 1973, in Dunedin, New Zealand. When the children were traced for follow-up at 3 years of age, 1037 children (91% of the eligible births, of whom 52% were boys) participated in the assessment and formed the base sample for the longitudinal study. With regard to social origins, the children's families were representative of the social-class and ethnic distribution of the general population of New Zealand's South Island. With regard to ethnic distribution, the Study members are of predominantly European ancestry. Fewer than 10% identify themselves as Maori or Pacific Islander. Cross-national comparisons and replication analyses lend some confidence about generalising findings from the Dunedin study to other western nations (see Moffitt, Caspi, Rutter, & Silva, 2001). Follow-ups of the sample have been carried out at ages 5, 7, 9, 11, 13, 15, 18, 21 and most recently 26, when we assessed 980 (96%) of the 1019 study members still alive.

### **Personality measure**

As part of the age-18 and age-26 assessments, participants completed a modified version (The Absorption scale was not included in our administration of the MPQ) of the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Patrick, Curtin, & Tellegen, 2002; see also Krueger, Caspi, & Moffitt, 2000). Complete personality protocols on both occasions are available for 921 participants. The MPQ is a self-report personality instrument designed to assess a broad range of individual differences in affective and behavioural style and yields 10 primary scales. These 10 primary scales can be organised under a three superfactor structure (Negative Emotionality, Constraint and Positive Emotionality).

Negative Emotionality (NEM) is a combination of the Aggression, Alienation and Stress Reaction scales. Individuals high on this dimension have a low general threshold for the experience of negative emotions such as fear, anxiety and anger, and tend to be involved in antagonistic relationships. Constraint is a combination of the Traditionalism, Harm Avoidance and Control scales. Individuals high on this factor tend to endorse social norms, act in a cautious and restrained manner and avoid thrills. Positive Emotionality is a combination of the Social Closeness, Well-Being, Achievement, Social Potency scales and reflects interpersonal connectedness, positive emotional responsiveness and effectance (Tellegen & Waller, *in press*). We scored these superfactors by summing the relevant subscales and used these as a supplement to the primary MPQ scales. Scale names, reliability estimates and descriptions of high scorers can be found in Table 1.

### **Counterproductive work behaviour**

To assess work experiences, study members were interviewed about their work as part of a life-history interview inquiring about their transition to adulthood at age 26. Workplace Counterproductive Behaviour was assessed with 11 interview questions concerning the frequency of the following behaviours: Number of times late to work, number of days absent under pretense, number of times using prohibited work materials, number of conflicts with boss, number of fights/arguments at work, number of times doing something at work that could get them fired, number of times they stole money from work, number of times they lied on their time sheet, number of times they stole things from work, number of times they damaged work property and number of times they were drunk or on drugs at work. As the distribution of each of these variables was far from normal, and because frequency counts often have less desirable psychometric properties, each variable was

Table 1. MPQ scale descriptions and reliability estimates

MPQ scale	Age 18 reliability <sup>a</sup>	Age 26 reliability	Description of high scorer
Constraint	0.82	0.87	Endorses social norms; acts in a cautious and restrained manner; avoids thrills
Traditionalism	0.63	0.74	Desires a conservative social environment; endorses high morals standards
Harm avoidance	0.71	0.79	Avoids excitement and danger; prefers safe activities even if they are tedious
Self-control	0.79	0.81	Is reflective, cautious, careful, rational and planful
Negative emotionality	0.86	0.89	Experiences elevated levels of negative emotions such as fear, anxiety and anger; antagonistic
Aggression	0.78	0.81	Hurts others for own advantage; will frighten and cause discomfort for others
Alienation	0.76	0.83	Feels mistreated, victimised, betrayed and the target of false rumors
Stress reaction	0.80	0.83	Is nervous, vulnerable, sensitive, prone to worry
Agentic positive emotionality	0.80	0.79	Seeks pleasurable experiences by engaging the environment and conquering the challenges it may present
Achievement	0.69	0.75	Works hard; enjoys demanding projects and working long hours
Social potency	0.76	0.78	Is forceful and decisive; fond of influencing others; fond of leadership roles
Communal positive emotionality	0.76	0.84	Seeks pleasurable experiences by establishing warm relationships with others
Well being	0.67	0.75	Has a happy, cheerful disposition; feels good about self and sees a bright future
Social closeness	0.75	0.80	Is sociable; likes people and turns to others for comfort

<sup>a</sup>Cronbach's alpha was used for reliability estimates of the 10 primary scales. Composite reliability was used for reliability estimates of the Constraint, Negative Emotionality, Agency and Communion superfactor scales.

converted to a dichotomous variable in which a person received a 0 if they did not do the behaviour and a 1 if they did any amount of the behaviour.

Instead of simply using the sum of the dichotomously scored items, we subjected these 11 items to an IRT analysis to determine the dimensionality of the index, as well as to properly score the index. For most IRT models, it is assumed that a single underlying latent trait or ability is sufficient to account for examinee performance. To test the unidimensionality assumption, we implemented a non-linear factor analysis procedure. Specifically, we utilised the method of comparing the ratio of first to second eigenvalues (obtained using an iterated principle axis factor analysis) for each within-scale matrix of tetrachoric correlations (Lord, 1980). The assumption that one dominant dimension is being tapped by the scale's items was supported, as one dimension accounted for a substantial portion of the variance.

BILOG (Mislevy & Bock, 1990) was used to estimate item parameters, as well as participants' latent trait. We fit a 2-PL IRT model to the workplace deviancy items, which involves estimating the discrimination (*a*) and difficulty (*b*) parameters. For the most part,

the BILOG defaults were used, which means that the method of Marginal Maximum Likelihood was used to estimate the difficulty parameters, and the discrimination parameters were estimated using Marginal Maximum A Posteriori, a Bayes procedure (see Hambleton, Swaminathan, & Rogers, 1991). We used the Bayes procedure of Expected A Posteriori (see Hambleton et al., 1991) to obtain  $\theta$  estimates for each participant. In terms of reliability, the Cronbach's alpha for the set of dichotomous items was 0.60. Examination of the Test Information Function (TIF) showed that the scale provided reliable information for the high end of Theta, from 0 to 2.5 on the Theta scale.

## RESULTS

The percentages for the items that make up the CWB Index are shown in Table 2. The most common counterproductive acts were being late to work and having a conflict or fight at work. The least common activities were associated with stealing money and destroying property.

We used hierarchical multiple regression to test whether age 26 CWBs were related to personality trait change from age 18 to 26. Each relevant age-18 MPQ scale was entered into the equation on the first step followed by the CWB variable on the second step predicting age 26 personality traits. If the de-investment variable contributed to the prediction of age 26 standing on the personality trait variable, this is inferred as showing that there is a relationship between de-investment behaviours and change in personality.

We hypothesised that CWBs would be related to changes in Negative Emotionality and Constraint. The first set of results shown in the first column of Table 3 supported our

Table 2. Means and standard deviations of counterproductive work behaviorus

Counterproductive act	Percentage
How many times in the past year. . .	
Have you been late to work?	51%
Have you pretended you were sick or injured, or gave another false excuse so you could get time off work?	34%
Have you used things at work without permission (like using the telephone, xerox machine, computer, tools or a company car without permission)?	17%
Have you had a conflict with your boss or supervisor (like refusing to carry out an assignment, told them a lie or some other trouble with the boss)?	29%
Have you lost your temper, had a fight or got into an argument with someone at work?	25%
Have you done your job in a way that could cause you to lose it (like taking shortcuts, missing deadlines, breaking safety rules)?	6%
Did you steal <i>money</i> from the place where you <i>worked</i> ?	1%
Have you reported working hours or days (so that you could get paid) that you really did not work?	4%
Did you steal <i>things</i> from work, such as office supplies, tools or merchandise?	17%
Did you purposely damage or destroy property, equipment, tools or merchandise where you <i>work</i> ?	1%
Have you been under the influence of alcohol or drugs while you were at <i>work</i> ?	19%

Table 3. Relationship between counterproductive work behaviours and change in personality traits

Change in personality from age 18 to age 26	Age 26 counterproductive work behaviours
Negative emotionality	0.16*
Stress reaction	0.13*
Aggression	0.18*
Alienation	0.07
Constraint	-0.15*
Self-control	-0.17*
Harm avoidance	-0.10*
Traditionalism	-0.09*
Positive emotionality	0.05
Social closeness	-0.07*
Well-being	0.02
Social potency	0.11*
Achievement	0.05

Note:  $N = 907$ ; coefficients in parentheses are beta weights with remaining predictor variables controlled.

\* $p < 0.01$ .

hypotheses for both personality dimensions. Participating in more CWBs in young adulthood was associated with significant changes in the higher-order dimensions of Negative Emotionality ( $\beta = 0.16$ ,  $p < 0.01$ ). At the facet level of Negative Emotionality, CWBs were associated with changes in Stress Reaction ( $\beta = 0.13$ ,  $p < 0.01$ ) and Aggression ( $\beta = 0.18$ ,  $p < 0.01$ ).

Also consistent with our expectations, CWBs were negatively associated with changes in measures of Constraint. At the overall level, CWBs were negatively related to changes in Constraint itself ( $\beta = -0.15$ ,  $p < 0.01$ ). At the facet level, CWBs were negatively related to changes in each sub-scale of Constraint, including Self-Control ( $\beta = -0.17$ ,  $p < 0.01$ ), Harm Avoidance ( $\beta = -0.10$ ,  $p < 0.01$ ) and Traditionalism ( $\beta = -0.09$ ,  $p < 0.01$ ).

We made one additional hypothesis that CWBs would be negatively associated with changes in the Social Closeness scale from the Positive Emotionality domain, which was born out. Specifically, individuals who participated in more counterproductive behaviours decreased in Social Closeness ( $\beta = -0.07$ ,  $p < 0.01$ ). Although we did not have specific hypotheses for the remaining scales from the Positive Emotionality domain, we did find a positive association between counterproductive behaviours and Social Potency ( $\beta = 0.11$ ,  $p < 0.01$ ). The latter finding was unexpected, as it shows that counterproductive behaviours are associated with increases in a putatively positive personality trait. Despite this one anomalous finding, the pattern of correlations was much as we expected. People who behaved non-normatively at work, became less emotionally stable, less constrained and less amiable; three trends which contradicted the normative patterns of change in these personality traits.

The personality changes reported in Table 3 should be interpreted in the context of the normative developmental trends for each personality trait (e.g. Roberts et al., 2002). For example, if the overall pattern is to decrease over time, as it is for traits from the domain of Negative Emotionality, then a positive relationship with change in Negative Emotionality may mean that the individuals participating in CWBs are not decreasing like everyone else rather than increasing on Negative Emotionality. To illustrate this point, we show the patterns of change across time for different levels of CWBs in Figures 1 and 2. Figure 1 shows the relationship between CWBs and changes in Stress Reaction. As can be seen by

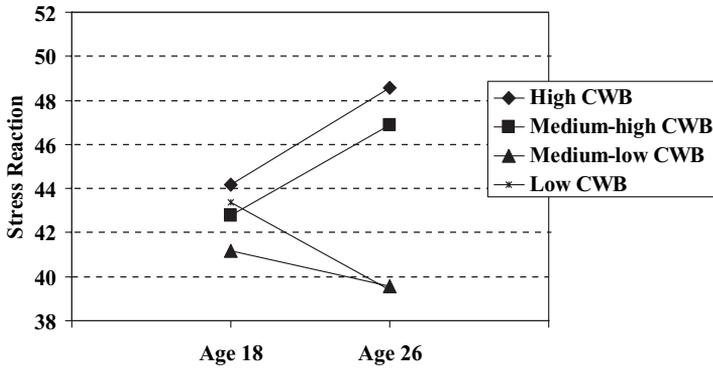


Figure 1. Changes in stress reaction at different levels of counterproductive work behaviour.

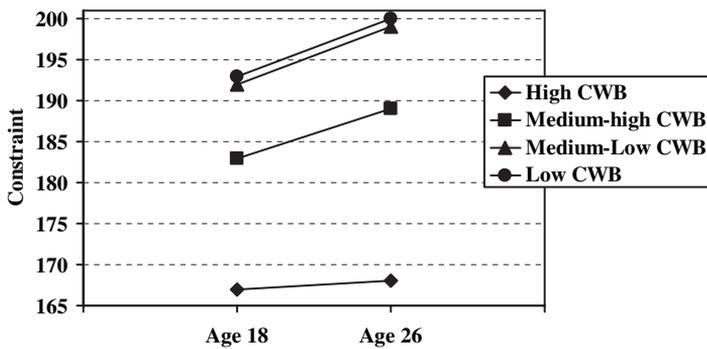


Figure 2. Changes in constraint at different levels of counterproductive work behaviour.

the overall pattern, there was little mean-level developmental change in Stress Reaction from age 18 to 26, and the interpretation of the positive correlation between CWB and change in Stress Reaction (in Table 1) is straightforward: Young adults who did not participate in CWBs tended to decrease in Stress Reaction over time whereas young adults who participated in the most CWBs increased in Stress Reaction over time. In contrast, Figure 2 shows the more subtle relationship between CWBs and changes in Constraint from age 18 to 26. As can be seen by the overall pattern, it was normative for young adults to increase in Constraint over time. Those individuals who participated the least in CWBs increased more on Constraint than the other groups (around 7 points on the scale). The individuals who participated in the most CWBs did not decrease in Control. Rather they failed to increase as much as others (1 point on the scale).

## DISCUSSION

As hypothesised, participation in CWBs was associated with changes in personality traits from the domains of Negative Emotionality, Constraint and the specific trait of Social Closeness. People who participated in more CWBs tended to increase in traits from the domain of Negative Emotionality, such as Stress Reaction and Aggression. In contrast,

these same people tended to not increase in traits from the domain of Constraint, such as Control, Harm Avoidance and Traditionalism.

Social investment is defined as investment in, and commitment to, adult social roles (Lodi-Smith & Roberts, *in press*). De-investment then, is the opposite of social investment. It is the active shirking of norms for appropriate behaviour in adult social roles. CWBs are a prototypical example of de-investment behaviour. Stealing from work, getting in fights with co-workers and feigning sickness to avoid going to work are activities that reflect an attitude of alienation from the typical occupational expectations. In terms of why people might participate in counterproductive behaviours, the straightforward answer is that alienated, disaffected and delinquent employees commit counterproductive acts because of who they are and the work conditions they experience (Roberts, Harms, Caspi, & Moffitt, 2006).

The question of why CWBs might contribute to personality trait change is more complex. We can speculate about several different mechanisms that might result in the patterns of personality trait change found in this study. The first mechanism proposed to play a role in the way social investment affects personality development is the array of expectations and norms that come with the enactment of roles of adulthood. Role norms define the desirable ways in which people are expected to act when they occupy a role. These expectations and norms can be articulated in personality trait terms (Sarbin & Jones, 1955). For example, in a typical work role experience in young adulthood, the role expectations would signal to people that they should act more agreeable, conscientious and emotionally stable (Wood & Roberts, *in press*). The assumption is that people will shape their own behaviour in response to the expectations that they hold and that others in their social environment promote (Holmes, 2002).

How would role expectations work in the case of de-investment? If most people hold expectations for acting contrary to counterproductive acts, then how would someone come to behave opposite of the typical norms? One of the key facilitators of norms and expectations are the other individuals who work in or with the person in their work role. Specifically, we have proposed that other people who are mentors or role models are the critical source of role norms and expectations (Roberts & Wood, 2006). Role norms will be more likely to be adopted if the relationship between the role model and the person is positive, as characterised in the 'mutually reinforcing orientation' which is critical to socialisation for children (Kochanska & Murray, 2000). One possibility is that the de-investor works for or with another individual who acts in a way counter to the average expectations for work behaviour. This would be analogous to the effect delinquent peers have on individuals who may have latent or unrealised delinquent tendencies (Goldstein, Davis-Kean, & Eccles, 2005). To properly investigate this possibility, we would need to assess the people in the work environment to see whether key individuals served as discriminative stimuli for counterproductive activities.

The second mechanism for change relies less on cognitive processing of expectations and norms and more on the unforeseen consequences of spontaneous behaviours. We also believe it to be the more likely pathway to personality change. This process derives out of the corresponsive principle, which states that the personality characteristics that lead people to have certain experiences, will in turn be changed by those experiences (Roberts & Caspi, 2003; Roberts & Wood, 2006). Specifically, trait-related experiences will reinforce people's personality traits. For example, in the case of CWBs, individuals who are less self-controlled and alienated are more likely to engage in CWBs (Roberts et al., 2006). And, as the present study shows, engaging in CWBs promotes

change in the direction of becoming less self-controlled and more alienated (see also, Harms, Roberts, & Winter, 2006; Roberts & Robins, 2004).

What remains to be explained is the process responsible for corresponive effects, especially when the experiences and changes run opposite of the typical trends in both work experiences and personality change. We see two potential pathways, one relatively simple, and the second more complex. First, individuals may change their personality ratings over time simply because they see themselves behaving in counterproductive ways, and through observing themselves in action, come to see themselves as less conscientious and less emotionally stable. This process, described as learning-generalisation (Caspi & Roberts, 1999; Kohn & Schooler, 1978; Roberts & Wood, 2006), is a bottom-up process in which people see themselves acting in a certain way and through this simple act of observation, come to a different opinion about themselves that then generalises across domains. In this process, change does not occur in response to objective standards of behavioural performance or through some top-down, expectation directed process, but through the simple act of behaving differently, which may occur unconsciously.

In contrast, the second pathway combines the mechanisms of corresponiveness with role norms and expectations. In this case, we assume that the role norms for work are to avoid counterproductive behaviours and that this is understood by employees, including those who are less self-controlled, more aggressive and anxious. These latter individuals will, of course, be more inclined toward counterproductive behaviours, but in these circumstances will be forced to curtail their tendencies and to self-regulate more than other people. This continuous call for self-regulation at work may lead to ego depletion (Baumeister, Bratlavsky, Muraven, & Tice, 1998), which in turn is associated with increases in aggressive behaviour in people with aggressive tendencies (Stucke & Baumeister, 2006). Therefore, the individual prone to counterproductive tendencies may commit counterproductive acts because they are forced to self-regulate more than other employees. Also, impulsive acts are themselves rewarding (Tice, Bratslavsky, & Baumeister, 2001). Thus, people may respond negatively to role norms because they are ego depleted, and may commit acts, such as lashing out or stealing something from work, because it feels good at the moment. This may then lead to the negative corresponive spiral that leads to changes in personality traits that run opposite of the general trends.

Thus, de-investment patterns may develop, and changes in personality traits that run counter to general trends may occur, through three potential pathways. People may be inspired by mentors and role models to adopt counterproductive behaviours and thus become more impulsive, aggressive and anxious over time. They may simply behave in counterproductive ways because of their personality, which results in increasing impulsivity, aggression and anxiety. Or, they may become depleted over time because they have to regulate their behaviour more than others, resulting in impulsive behaviours which manifest as counterproductive acts. Of course, it is highly likely that these pathways are not distinct, and that some mix of each process works to promote personality change. Also, no studies to date have endeavoured to examine personality change at this micro-analytic level, so as to understand which mechanisms are responsible for change. Future longitudinal research should work to provide a more thorough test of change processes by doing more to assess the contexts and experiences that people live in, rather than focusing only on assessing personality traits over time.

The existence of associations between personality trait change and de-investment patterns is also important for general theories of personality and personality development.

The social investment model of personality development in young adulthood is only one theoretical account of the general trends for people to become more agreeable, conscientious and emotionally stable in young adulthood. The second account for these changes, provided by the Five-Factor Model posits a much more parsimonious explanation (McCrae et al., 2000). People become more 'mature' in personality trait terms because they share a species-wide genetic proclivity to increase in these traits. Moreover, based on the general assumptions of the Five-Factor Model, these changes are not initiated because of environment influences, but simply because the genes make people change.

The findings reported in this paper are relevant in several ways to this proposition of the Five Factor Model. First, the fact that there are people who show personality trait change opposite of the normative pattern calls into question any assumptions about a universal pattern of development. With this heterogeneity in mind, the best we can conclude is that enough people increase on agreeableness, conscientiousness and emotional stability to facilitate normative trends, but that the heterogeneity in change demonstrates that not all people change in the same manner. Thus, individual differences in change are the rule, not the exception. Second, if there is a species-wide gene or genes that promote a specific pattern of change, then at a minimum, the results of this study clearly point to the possibility that not everyone shares this gene. In addition, these results could be folded into the burgeoning evidence that personality traits are actually influenced by the environment (Roberts et al., 2005), which contradicts a fundamental assumption of the Five Factor Model.

It should be noted that the present study has important limitations. First, the current study relied exclusively on self-report measures. Future studies should use multi-method assessments and draw on information from multiple sources to establish firmer conclusions about the nature of the relations between personality change and de-investment behaviours. Second, it is impossible given the current design to infer causality. It may be that some people are increasing on negative emotionality and decreasing on constraint, and subsequently start participating in CWBs, rather than the other way around. In the absence of more controlled studies or studies that track environmental and personality factors over multiple waves (e.g. Roberts & Bogg, 2004), we can at best conclude that the relationship is most likely reciprocal.

An argument could be made that the changes were all small in magnitude, and this would be a reasonable conclusion. But this argument merits further consideration. First, what is a small effect size in terms of changing personality traits? Traits are presumed to be some of the least changeable factors studied in personality psychology if not psychology in general (Conley, 1984). Given their known effect on such significant life outcomes as occupational success, longevity and health (Friedman, 2000; Judge, Higgins, Thoreson, & Barrick, 1999; Roberts & Bogg, 2004; Siegler et al., 2003), any change in these attributes may reap unknown benefits and pitfalls for those individuals who do change. It is quite possible that even small changes in personality traits may have profound effects on work and health across the life course. For example, the two factors of Negative Emotionality and Constraint play significant roles in work for many people. Negative Emotionality, which can be seen as synonymous with Neuroticism from the Five Factor model, is one of the strongest predictors of job satisfaction (Judge & Bono, 2001). This is even more important to CWBs as job satisfaction is one of the best predictors of CWBs and is often independent of the effect of personality traits (Roberts et al., 2006). Therefore, the small increase in Stress Reaction that is associated with CWBs may play itself out in a vicious cycle. People behave counterproductively, then come to see themselves as unhappy, which in turn

undermines their job satisfaction, which may lead to more counterproductive activities. So, though the effect sizes were small, the cumulative effect of the changes may be profound.

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