Personality across working life: The longitudinal and reciprocal influences of personality on work

STEPHEN A. WOODS[1]*, FILIP LIEVENS[2], FILIP DE FRUYT[3] AND BART WILLE[3]

[1]Aston Business School, Aston University, Birmingham, U.K.
[2]Department of Personnel Management and Work and Organizational Psychology, Ghent University, Ghent, Belgium
[3]Department of Developmental, Personality and Social Psychology, Ghent University, Ghent, Belgium

Summary   This paper focuses on the role of personality at different stages of people's working lives. We begin by reviewing the research in industrial, work, and organizational (IWO) psychology regarding the longitudinal and dynamic influences of personality as an *independent* variable at different career stages, structuring our review around a framework of people's working lives and careers over time. Next, we review recent studies in the personality and developmental psychology domain regarding the influence of changing life roles on personality. In this domain, personality also serves as a *dependent* variable. By blending these two domains, it becomes clear that the study of reciprocal effects of work and personality might open a new angle in IWO psychology's long-standing tradition of personality research. To this end, we outline various implications for conceptual development (e.g., trait stability) and empirical research (e.g., personality and work incongruence). Finally, we discuss some methodological and statistical considerations for research in this new research domain. In the end, our review should enrich the way that IWO psychologists understand personality at work, focusing away from its unidirectional predictivist influence on job performance toward a more complex longitudinal reciprocal interplay of personality and working life. Copyright © 2013 John Wiley & Sons, Ltd.

Keywords: personality; careers; five-factor model; personality development; reciprocal influences

Over the past quarter century, few topics in organizational behavior and work and organizational psychology have attracted more pages of journal space than personality research. The centrality of personality in so much organizational behavior theory is all the more remarkable because it represents for personality trait theory, particularly, a dramatic turnaround of fortune. Beginning in the late 1980s and consolidating in the now famous meta-analyses of the 1990s (e.g., Barrick & Mount, 1991; Salgado, 1997; Tett, Jackson, Rothstein, & Reddon, 1994), research has established the predictive associations of personality with a broad range of organizational criteria (for an overview, see Judge, Klinger, Simon, and Yang, 2008).

Despite the obvious successes of such research, there are key trends within the literature that are problematic for further development of theory and understanding of the role of personality in organizational behavior. These trends stem principally from a persistent preoccupation of researchers on the question of personality trait validity, the use of personality trait assessments to predict performance immediately following selection. This topic, although undoubtedly important, has, we feel, detracted from an integrated understanding of how personality traits relate to organizational behavior across people's working lives in the longer term.

In particular, the focus on predictive validity has resulted in two important limitations in the current literature. First, the relations of personality and criteria are implicitly treated as static. The vast majority of published studies are either cross-sectional or longitudinal across only two time points. In a typical longitudinal study of personality and performance, traits are measured at Time 1 and performance at Time 2, and prospective associations calculated. Is it reasonable to assume that these relations remain the same in the long term? Most people would intuitively accept that performance demands change over time, and indeed, performance theory has formalized this point

(Murphy, 1989). Working lives and the demands and contexts that they present are dynamic and changeable, and so it follows that the relations of traits and criteria may also dynamically change over time and at different career stages. This perspective is rarely acknowledged in research.

Second, in almost all studies in organizational behavior, personality is treated solely as a *predictor* variable. The literature on the longitudinal stability of personality (Roberts & DelVecchio, 2000) means that for the purpose of theory building, it is convenient to conceptualize personality as a stable property of the person that predicts behavioral, emotional, or attitudinal outcomes. However, in other domains outside industrial, work, and organizational (IWO) psychology, the possibility that personality traits may both affect and be affected by work has been recently considered (e.g., Wille, Beyers, & De Fruyt, 2012; Wu & Griffin, 2012). Work is a core part of everybody's lives, and to purport that the direction of influence from personality to work is only one way, rather than reciprocal, seems close minded.

Therefore, this paper has two aims. First, we adopt a whole-career perspective and review the role of personality at different stages of people's working lives. Specifically, we examine the longitudinal and dynamic influences of personality traits at different career stages. This first part of the paper is mostly focused on longitudinal research in IWO psychology, although we will also include relevant studies from developmental psychology. In this body of research, personality plays its traditional role as an independent variable for predicting stable or dynamic criteria across career stages.

Second, we provide a review of the emerging literature on the influence of changing life roles on personality. This review is almost entirely based on recent studies outside the IWO domain as the studies reviewed come from personality and developmental psychology. Here, personality typically serves as the dependent variable, with the focus on the reciprocal effects between personality and work.

We believe that the blending of insights resulting from these two aims might be extremely fruitful for enriching the way that IWO psychologists understand personality at work, focusing away from its simple predictivist influence on job performance and toward a more complex longitudinal reciprocal interplay of personality and working life. To this end, the last section of this paper presents the implications for theory, future research, and methodology that result from our review.

Note that we conceptualize personality in terms of the five-factor model (FFM). So our review concentrates on evidence from studies in which personality is operationalized using the personality factors of extraversion, agreeableness, conscientiousness, emotional stability (vs. neuroticism), and openness. Like many before us (e.g., Saucier and Goldberg, 1996; Goldberg, 1993), we adopt a phenotypic perspective on the FFM, as a framework for describing people's characteristic patterns of within-context thoughts, feelings, and actions (i.e., *what people do*). Theoretically, however, we also assume that these patterns of behavior, thoughts, and emotions contribute to an explanation of how, and in what ways, people navigate through their careers (i.e., *why people do*).

Personality and Working Life: Dynamic and Developmental Interactions

In our review of the interactions of personality and work across the life span, we adopt a framework based on Super's (1980) career stages (i.e., growth, exploration, establishment, maintenance, and disengagement). In each case, we review the longitudinal and/or dynamic associations of personality and outcomes, thereby avoiding simple associative research findings deliberately.

Working life as described in the Super framework represents a dynamic background for behavior and personality expression, comprising multiple contexts, demands, and challenges. Social cognitive theories of personality (Mischel & Shoda, 1998) emphasize the contextual factors that influence behavior. In particular, the work of Mischel on situational strength and behavior encouraged a focus on the conditions under which traits are likely to manifest in behavior, leading to the development of trait activation theory (TAT; Tett & Burnett, 2003). In TAT, behavior results from an interaction between person and situation, with situations acting as cues to activate certain traits. Specific traits are expressed in behavior when the situation or context allows freedom of trait expression (i.e., the situation is weak), and the features of the situation activate those specific traits.

The TAT is relevant in the longitudinal examination of personality and its interaction with work because over time, the demands, contexts, and situational features of work are in a state of flux. Even over relatively short periods, the demands that are placed on workers may change (Thoresen, Bradley, Bliese, & Thoresen, 2004), such that performance and other outcomes at two points in time might result from different behavior-in-context combinations and therefore be related to different traits. More broadly, traits that are activated at one stage of a person's career (e.g., career exploration) may be different from those activated at others (e.g., career establishment). TAT also provides a framework for understanding person–job fit, whereby a person's situational responses make them suitable for specific kinds of work activity. Thus, the TAT framework enables theoretical modeling of the dynamic effects of personality on work outcomes across time and in different vocational environments.

Growth: echoes of childhood at work

People's vocational life commences long before the first job. Although studies of elementary school children suggest that they do not have well-formulated vocational interests (Tracey, 2001), Woods and Hampson (2010) proposed that childhood personality traits are a potential major influence on the development of vocational interests. That is, certain personality traits (specifically openness, conscientiousness, and extraversion) might lead children to gravitate toward certain kinds of activity and therefore to acquire certain competencies that in turn lead to the shaping of vocational interests, and later-life vocational choices. So, at an early age, the natural tendencies of children to be more experimental (openness), social (extraversion), or methodical (conscientiousness) might lead children to develop the skills and competencies that contribute to preferences for certain kinds of job activity.

In support of this, Woods and Hampson (2010) reported findings from the Hawaii personality and health cohort study, examining the prospective associations of personality traits measured at ages 6–12, with occupation characteristics (classified on Holland's RIASEC dimensions; Holland, 1997) at midlife. Their findings showed prospective associations of personality and occupations across more than 40 years in some cases, with openness being associated with artistic, investigative, and conventional (negative) and conscientiousness associated with all of the vocational types (negatively with realistic). Woods and Hampson also demonstrated the moderation of the association of openness and occupational environments by gender. The proposed theoretical explanation was imagination and experimentation, and the tendency of children higher on openness to go against the gender stereotypic norm, to imagine themselves in a wider range of potential adult roles, and therefore to develop self-concepts that are less reliant on and consistent with gender stereotypes. In sum, there appears to be an early interaction of personality and work, with traits pushing children toward certain activities and preferences. The contexts of exploring activity preferences and competencies represent weak situations that activate the personality traits and natural preferences of children. The pathways of working life and the role of work in identity seem to be set in "skeleton form" in early years of childhood.

The college years: personality and preparation for working life

Personality in adolescence and early adulthood also exerts major influences on later-life career outcomes through education attainment. The success that people achieve during their education has a substantial impact on their occupational trajectory and simultaneously opens up some career opportunities, while closing others.

Traits such as conscientiousness and emotional stability have been identified as consistent longitudinal noncognitive associates of educational attainment (e.g., Chamorro-Premuzic & Furnham, 2003). Interestingly, several independent studies also point to dynamic relations of traits with criteria, whereby personality traits assume greater or lesser predictive power at different stages of tertiary education, and on different indicators. For instance, Zyphur, Bradley, Landis, and Thoresen (2008) analyzed the associations of cognitive ability and personality on grade point average over time. They reported that although both cognitive ability and conscientiousness were associated with initial performance,

only conscientiousness related to performance growth. Students higher on conscientiousness improved their grade point average over time, whereas students' cognitive ability did not predict change in performance.

In another study, Lievens, Ones, and Dilchert (2009) reported the validities of personality traits over seven years of medical school. The observed[1] validities of two personality factors (extraversion and openness) showed some increases for predicting grade point averages, whereas the observed validities of the other three factors remained constant. How can the dynamic effects of these two personality factors on academic performance be explained? Such dynamic effects are often linked to changing educational demands. For instance, in the medical education study, in Year 1, the emphasis was on developing declarative and procedural knowledge, which was likely to draw more on cognitive ability. By Year 7, however, medical students were required to work more in interpersonal contexts (e.g., internships or clerkships) wherein being sociable and open became key assets. This is a clear example of TAT in action, with traits being associated with outcomes when situations trigger trait-related behaviors that are likely to result in differentiated performance.

Career exploration: becoming the worker

Entering the working world presents a new context for people's lives. Becoming a worker or employee presents a new set of challenges and a platform for growth and development. Obvious potential influences of personality on career exploration are through its effects on vocational interests and choices. If personality is indicative of vocational interests, then it should be possible to observe its effects on occupational choice over time. People's traits should relate to their choices of careers over the course of their lives, with people selecting jobs that fit with their interests, and by extension, their personality traits. Over the years, a large body of research has found support for this gravitation hypothesis.

In a longitudinal test of this gravitation hypothesis, Judge, Higgins, Thoresen, and Barrick (1999) examined whether the Big Five traits measured in adolescence were associated with the RIASEC characteristics of occupational environments later in life. They reported prospective associations of openness with artistic and conventional (negative) occupations, agreeableness with social and investigative (negative), and extraversion with realistic. These longitudinal findings are complemented by studies examining the predictive validities of vocational interest measures for predicting occupational choices in early adulthood (e.g., De Fruyt & Mervielde, 1999). So, in line with our earlier conclusions, it seems that personality traits, through vocational interests, influence the occupations that people select as they enter work (Woods & Hampson, 2010).

Career establishment and maintenance

In Super's framework, establishment and maintenance of a career are treated as distinct stages and collectively cover around 40 years of working life. Although we acknowledge that this period constitutes the major part of people's careers and therefore comprises a variety of challenges and diverse demands, for the purposes of our review, we will explore the role of personality within these stages together. We make a distinction between the effects of personality on motivation, performance, and satisfaction on the one hand and the effects of personality on performance trajectories on the other hand.

Personality and work motivation, performance, and satisfaction

One of the most well-known findings in the field of personality is that high conscientiousness and low neuroticism are related to job performance (Hurtz & Donovan, 2000) and career success (Judge et al., 1999). It is noteworthy that

---

[1]As noted by an anonymous reviewer, we focus on the observed validities because the corrected validity estimates are also corrected for scale compression in the dependent variable (grade point average), which was typically not performed in previous research.

meta-analytic research also demonstrated that these same two FFM traits are related to performance motivation (Judge & Ilies, 2002) and to satisfaction at work (Judge, Heller, & Mount, 2002). Moreover, these results conform to meta-analytic correlations between the FFM traits and life satisfaction (DeNeve & Cooper, 1998). So, prior research provides evidence of relatively robust relations between specific FFM traits (conscientiousness and neuroticism) and motivation, satisfaction, and performance. Although a full process model has not been tested, it seems like motivational and core self-evaluative processes serve as the intermediate mechanisms by which some FFM traits are predictive of performance and satisfaction (Barrick, Mount, & Strauss, 1993; Bono & Judge, 2003).

Illustrative evidence for this kind of effect may be taken from studies of job characteristics. Judge, Bono, and Locke (2000) found that people with high core self-evaluations actually attained more challenging jobs within their careers. This reflects a process by which people with higher self-efficacy and self-esteem tend to set themselves and accept more challenging goals and tasks and be more motivated to achieve them (Bono & Judge, 2003; Erez & Judge, 2001). The role of neuroticism in vocational behavior might also be understood in the context of an approach/avoidance framework (Ferris, Rosen, Johnson, Brown, Risavy, & Heller 2011). Low emotional stability (or high neuroticism) is associated with an avoidant approach, in which people select tasks, activities, and behavioral strategies with the aim of minimizing threat of failure. For example, Woods, Patterson and Koczwara (2013) examined the association of the Big Five with occupational specialty choice in a sample of junior medics and found that choices of realistic (e.g., surgery) and enterprising (e.g., acute medicine) specialties, which generally have greater individual responsibility, were associated with low neuroticism.

Integrating the aforementioned with the observation that people higher on conscientiousness are more achievement oriented and likely to be committed to delivering on goals and objectives (Barrick et al., 1993) suggests that individuals with combined high conscientiousness and low neuroticism are likely to grasp opportunities to work on challenging and complex tasks, without the demotivating effects of fearing failure or a negative outcome. Taken together, job characteristics such as job complexity, skill variety, and autonomy represent mechanisms by which, in their working lives, people lower in neuroticism and higher in conscientiousness attain more positive and rewarding jobs.

This research base underlines the importance of longitudinal and developmental perspectives of the association of personality and organizational behavior. The association of personality and job satisfaction is most often understood as an affective one (e.g., Heller, Judge, & Watson, 2002). In such models, neuroticism and the positive emotional component of extraversion are assumed to influence job satisfaction because the effects of negative and positive affects respectively mean that people attend to and perceive their job characteristics as either generally more unfavorable or favorable. However, by looking at such associations from a developmental perspective, incorporating ideas of performance motivation, core self-evaluative and approach/avoidance tendencies, and their cumulative effects over careers and working lives on job decisions, the affective explanation becomes only part of the picture. Rather, in combination with achievement-related traits such as conscientiousness, dispositional affective personality traits such as neuroticism may have real impact on actual attainment of jobs with more rewarding and satisfying features and characteristics.

A related, yet somewhat poorly understood, area of focus is the relation of personality with burnout. Meta-analyses (Alarcon, Eschleman, & Bowling, 2009) suggest that all of the Big Five except openness are associated with burnout, but the vast majority of studies in the area are cross-sectional. Longitudinal studies again suggest dynamic associations of personality and burnout. In a study of nurses, Deary, Watson, and Hogston (2003) found that neuroticism measured at entry into a nursing program was a significant predictor of emotional exhaustion at 12 months, but not at 24 months. Openness was positively related to emotional exhaustion at 24 months, but not at 12 months. Similarly, Armon, Shirom, and Melamed (2012) reported that neuroticism was a negative predictor of future emotional exhaustion, contrary to expectations, and that conscientiousness was a positive predictor of emotional exhaustion, but a negative predictor of cognitive weariness. One possible explanation is one of dynamic effects by which people high in neuroticism withdraw from threatening situations that might lead to emotional exhaustion, whereas people higher in conscientiousness, although more motivated and invested at work, may be so focused on work that they are at higher risk of burnout in the long term.

Personality and performance trajectories

As noted at the outset of our review, the treatment of job performance as a stable construct constitutes an important limitation in the personality and performance literature (Thoresen et al., 2004). This treatment runs counter to emergent evidence suggesting that performance increases linearly, then plateaus following a learning curve, and eventually declines over long periods (Zyphur, Chaturvedi, & Arvey, 2008). If performance is incorrectly assumed to be stable, then theoretical perspectives on personality and performance may be likewise incorrect. Longitudinal studies of personality and performance trajectories address this concern head-on and have uncovered some new relationships and effects that build understanding of how personality influences performance over time.

Perspectives on individual differences and job performance seem to converge on the idea that performance results from a combination of ability and motivation (e.g., Zyphur, Bradley et al., 2008). The problem-solving advantage given by cognitive ability may be thought of as the "can do" of performance, with the motivational drive to initiate and persist in goal-directed behavior being thought of as the "will do" of performance (Gottfredson, 2002). The treatment of performance as a stable construct assumes that both elements remain equally important over time. However, it is more intuitively accessible to conceive that "can-do" and "will-do" aspects of performance are more or less important at different job stages.

Differentiating transitional job stages (where demands are novel and not clearly defined) from maintenance job stages (where workers have generally mastered the tasks and activities associated with their jobs), Murphy (1989) proposed that cognitive ability would be most predictive of performance at transition stages and that personality factors would become more important during maintenance stages. Recent research has taken this theorizing a step further to examine the differentiation of personality associations of performance within different job stages. Thoresen et al. (2004) examined how personality dimensions of the Big Five model differentiated sales performance among individuals at two different job stages and also the association of the Big Five with performance growth (i.e., performance change over time at different job stages). They observed differential patterns of prediction in maintenance and transitional employee samples. Conscientiousness was associated with mean performance and performance growth in the maintenance sample (also Zyphur, Bradley et al., 2008). Extraversion was associated with mean performance. In the transitional sample, openness and agreeableness were positively associated with mean performance and also with performance growth. Thoresen et al. reasoned that in the transitional sample, adaptive behavior (associated with openness) and interpersonal network building (associated with agreeableness) were the most likely reasons for enhanced sales performance. In a related study, Stewart (1999) showed that although conscientiousness was associated with performance at both transitional and maintenance stages, incremental validity effects in these two stages could be attributed to different facets of conscientiousness. Specifically, the dependability aspects of conscientiousness (e.g., self-discipline) were related to job performance at the transitional stage, whereas the volitional facets of conscientiousness (e.g., achievement motivation) were linked to job performance at the maintenance stage.

Openness has also been implicated as influential in recent studies of performance trajectories. Minbashian, Earle, and Bright (2013) examined performance trajectories of 129 newly employed professionals. They found that performance plateaued on average at 2.93 years and then started to decline. Performance deceleration was slower for those higher on openness, which reflects the higher levels of learning orientation for those high on openness, which may lead them to focus on mastering tasks that are beneficial for performance in the long term according to Minbashian et al. The accumulating results of studies that look at the dynamic relations of personality and performance are compelling but have lacked a strong theoretical framework for understanding the pattern of relations. TAT affords such a theoretical lens. Maintenance and transitional job stages are simply two forms of situational features that act as contexts for job performance. Work presents people with a wider variety of challenges and a richer palette of situational variance, to which they must respond to facilitate performance and growth over time.

Taken together, the findings of studies looking at performance trajectories and the theoretical frameworks used to understand them suggest a clearer picture of how personality traits influence performance and growth in people's working lives. Through the course of their careers, people encounter a variety of different job demands. These

demands act as situational cues that activate personality traits and trigger responses. The nature of those responses in context influences their relative effectiveness, with clear implications for performance, advancement, and growth over time. Conscientiousness appears to predict performance growth and general performance effort over time, whereas openness rather predicts adaptation and is more important in transitional contexts. Results such as those of Thoresen et al. (2004) also point to job specificity in these processes.

Retirement

Although there is now increasing societal debate about the appropriate age for retirement, at a certain point of time, every worker is allowed or obliged to retreat from the professional labor market. Given the significance of this key life experience, individuals' adaptation to retirement has been a focal point for researchers as well as more popular media (Wang, 2007). However, we found only one longitudinal study. Löckenhoff, Terracciano, and Costa (2009) examined the relations between the Big Five personality traits and the retirement transition, which reported little evidence indicating that personality traits predict future retirement. Clearly, given the aging workforce, more research is needed in this area.

Conclusions

In this section, we have reviewed literature on the longitudinal, dynamic, and developmental relations of personality and work outcomes. During childhood and education, personality traits set people on a career path, the effects of which one can trace over many decades. Personality traits at this early stage also help people to navigate specific career and performance challenges, such as education attainment. In exploring the working world, a variety of traits predict occupational choices, and also occupational specialties. Those choices may have later effects on job satisfaction through the attainment of more rewarding and complex job roles.

We have argued for the importance of a dynamic model of performance demands, which change as a function of time, and present changing stages and contexts within which the effects of personality play out. Whereas some traits, such as conscientiousness may have more persistent performance benefits, others such as agreeableness and openness may again help people navigate specific stages of their careers and occupations, which in turn exert prospective effects on working life outcomes.

Finally, it is important to note that we covered here a selection of work outcomes from different domains, including occupational selection, work performance and adjustment, and occupational health. This does not mean, however, that our list of criteria is exhaustive. The research on work stress, for instance, could only be briefly touched upon in this review. Similarly, as noted in the introduction, this review was restricted to cover only general personality studies, while increasing attention is also being devoted to the prospective effects of more maladaptive or aberrant personality tendencies on various work-related outcomes (e.g., Moscoso & Salgado, 2004; Wille, De Fruyt, & De Clercq, 2013).

Reciprocal Relations between Personality and Working Life

Complementing the evidence for the relative stability of personality (Roberts & DelVecchio, 2000), there is now increasing consensus that traits also continue to develop throughout adult life (Roberts, Robins, Caspi, & Trzesniewski, 2003; Roberts, Walton, & Viechtbauer, 2006), and personality theory also shifts in that direction. Roberts and colleagues (Lodi-Smith & Roberts, 2007; Roberts, Wood, & Smith, 2005), for instance, proposed the Social Investment Principle as a context-driven mechanism that accounts for changes in traits. The central hypothesis in this perspective is that age-graded social norms, such as entering a committed relationship or the workforce, drive personality in the direction of functional maturity, that is, greater emotional stability, dominance,

agreeableness, and conscientiousness. The underlying mechanism involves a process of role taking across different life domains, including work (Wood & Roberts, 2006). When the individual commits to a social role, his or her personality shifts to reflect the expectations of that role. Behaviors within these social institutions are rewarded or punished on the basis of role expectations, and personality change is therefore a response to these contingencies. Normative changes in personality traits are the result of most people engaging in social institutions (e.g., careers or marriage) at roughly the same time.

In the next sections, we provide evidence for this perspective on personality by reviewing studies, mainly from the personality and developmental literature, which provide evidence for the reciprocity of personality and work across different stages in vocational development. As far as possible, we again draw on Super's (1980) framework. We will use these findings to argue for a reframing of personality theory in the IWO literature.

Influences of schooling on personality

Already in childhood and early adolescence, aspects of vocational identity are formed that significantly impact later professional life (Hartung, Porfeli, & Vondracek, 2005). Relatively little is known, however, about the mechanisms behind childhood work socialization and how this impacts personality trait development.

In one recent line of research, schooling is examined as a primary source of work socialization, influencing trait development. School represents an arena in which students themselves have to take on duties and responsibilities. They are expected to commit to the particular role expectations and social norms to master the challenges of everyday school life (Bleidorn, 2012). Successful investment in this school role would require students to be task and goal directed, to be organized, to delay gratification, to follow prescribed norms, and to use effortful strategies.

In a recent study of 910 German high-school students, Bleidorn (2012) examined to what extent investment in this student role influenced personality trait change, focusing on the period before high-school graduation. This period can be considered a "strong situation" likely to promote personality trait change, because it includes a press for a new way of behaving while providing clear information on how to behave adaptively (Bleidorn, 2012). Results indicated that the rising goal of a successful graduation stimulated role-congruent behavior, which was in turn related to increases in conscientiousness.

The college years: personality and preparation for working life

As we have discussed, the college years are important professionally because they influence future vocational directions. However, for many people, the three, four, or five years at college also represent an important phase in their personal lives. Often, it is a stage of life in which people start or intensify the establishment of a personal and independent identity, using the specific challenges during this life stage (e.g., living independently, creating a new personal network, and so on) as building blocks. In developmental terms, these college years cover a period of "emerging" adulthood (Arnett, 2000), when individuals make major decisions concerning the shape and content of their life course: Will they marry? Will they have children? Which career will they pursue—the one with high financial rewards or the one that is personally rewarding?

Inspired by these questions, Roberts, O'Donnell, and Robins (2004) examined developmental trajectories in major life goals (i.e., economic, esthetic, social, relationship, political, hedonistic, and religious) over a four-year period covering the college years. Participants rated the importance of their life goals six times over a four-year period and completed a measure of the Big Five personality traits at the beginning and end of college. The authors found a strong pattern of correspondence between the concurrent correlational pattern and the across-time change patterns. For example, agreeableness was positively correlated with relationship goals (e.g., desiring a family), and changes in this trait were also positively associated with changes in this specific life goal. Similar observations were reported by Harms, Roberts, and Winter (2006) who found that the traits that led an individual to fit well with

the college environment were enhanced by the experience of being in that environment and increased over time. According to Roberts, Caspi, and Moffitt (2003), the major implication of this corresponsive mechanism is that each person's developmental path is in part determined by his or her preexisting personality characteristics, and most people follow a path that deepens and reinforces those characteristics over time.

Of course, not everyone going through this period of young adulthood chooses the higher academic track, rather choosing a vocational track entering the working world somewhat earlier. Lüdtke, Roberts, Trautwein, and Nagy (2011) reported that these different life paths during emerging adulthood were predictive for different trait change patterns, particularly for agreeableness and conscientiousness (measured in their sample at three time points over four years). Entering some form of vocational training was negatively linked to growth in agreeableness, indicating that on average, participants who took the vocational track did not increase as fast on agreeableness. In contrast, following the vocational track was positively linked to growth in conscientiousness. The authors concluded that the changes that occur as a result of following these different paths reflect the idiosyncratic nature of the types of experiences found for this life path. Specifically, people embarking on more work-oriented tracks are supposed to be called upon to show potential employers that they are viable future employees by being hardworking and industrious. Conversely, the more competitive nature of these activities may lead to an increased attenuation of agreeableness in this stage of life.

Career exploration: effect of early work experiences on personality

Probably even more than moving from high school to college, the transition from college to work requires a significant change in mind for many individuals. From a developmental as well as from vocational perspective, the initial years on the labor market are extremely important for future adaptation and adjustment. A handful of studies have examined the effects of initial work experiences on a broad range of personality-related variables. Roberts, Caspi, et al. (2003) found a broad range of early career work experiences (i.e., occupational attainment, resource power, work satisfaction, work involvement, financial security, work autonomy, and work stimulation) to influence changes in affective dispositions such as measured by the Multidimensional Personality Questionnaire (Tellegen, 1982).

More recently, Wille et al. (2012) tracked young adults' personality and vocational development across the first 15 years after graduation. In a longitudinal college alumni sample, these authors specifically examined the reciprocal relations between FFM trait change and work experiences over this time interval, differentiating between six universal career roles (maker, expert, presenter, guide, director, and inspirator; Hoekstra, 2011). The results indicated that change in career role engagement was associated with change in four of the five personality traits over the same time interval. Only for openness were no significant associations found between trait change and change in career role engagement. Importantly, the results indicated that increases in career role engagement generally stimulated normative personality trait development. For example, normative decreases in neuroticism were more pronounced for individuals showing stronger increases in director, presenter, and inspirator roles. Similarly, normative increases in conscientiousness were more pronounced for individuals showing stronger increases in director, inspirator, guide, and expert roles. This is consistent with other research demonstrating that investment in the work role contributes to normative personality development (e.g., Roberts, Caspi, et al., 2003). However, the results also illustrate how investment in certain aspects of the work role can contribute to nonnormative trait development (i.e., changes in personality traits that run counter to general trends). Specifically, Wille et al. found that stronger increases in the director and inspirator roles during the first career stage were associated with smaller increases or even decreases in agreeableness. Apparently, these two career roles impose certain behaviors or tendencies to people that buffer or hinder the naturally expected growth in agreeableness. Prior research had already demonstrated that nonnormative trait change in young adulthood is associated with de-investment in the work role, such as engagement in counterproductive work behaviors (Roberts, Walton, Bogg, & Caspi, 2006). The results of the study by Wille et al. shed new light on this domain by showing that stronger work role involvement not

necessarily contributes to normative personality development, but that the effect rather depends on the specific work role content.

Personality development and successful career establishment

Over the long period of career establishment and maintenance, the social investment perspective on personality development becomes particularly salient. A key principle in the social investment perspective is that *successful* investment in social roles, including the work role, should be a driving force behind trait development. Although the IWO literature has up until now mainly focused on the validity of traits to predict objective and subjective aspects of career success, research in the personality domain has started to investigate such reciprocal relations over the past decade (Roberts, Caspi, et al., 2003; Roberts & Chapman, 2000; Scollon & Diener, 2006; Sutin, Costa, Miech, & Eaton, 2009).

In terms of subjective career success, Scollon and Diener (2006) examined the associations between change in extraversion and neuroticism on the one hand and change in work role satisfaction on the other. They also explored patterns of trait change and reciprocal relations with work role satisfaction separately for a younger (under age 30) versus an older (age 30 and over) group of adults. Despite impressive rank-order stability of traits ($r > .60$ over the eight-year interval), significant within-person changes in neuroticism and extraversion were identified. Interestingly, individuals over age 30 exhibited just as much change as those under 30, challenging the idea that personality becomes "set like plaster" by age 30 or that development slows down after young adulthood (Costa & McCrae, 2006). Regarding reciprocal effects, it was first found that increased work satisfaction accompanied decreases in neuroticism and increases in extraversion over time. Again, correlations among changes were similar for the older and younger samples, indicating that transactional influences on development are not limited to young adulthood or the early years of the career. Although the cross-lagged analyses provided more evidence for trait effects on (change in) work satisfaction, modest support was also gathered for work satisfaction leading to increased extraversion, a finding that supports social investment perspectives on trait development. At least, these findings lend further support for the idea that the social environment, including the work role, shapes personality and vice versa (Scollon & Diener, 2006).

More recently, Sutin et al. (2009) considered indicators of extrinsic career success (i.e., occupational prestige and personal income) as a source of personality trait change. Cross-lagged models were used to test whether personality predicted change in career success over a 10-year interval and, likewise, whether these markers predicted change in personality. The longitudinal analyses provided clear evidence for reciprocal effects, at least among younger participants. Specifically, earning a higher income at baseline predicted decreases in neuroticism across the 10 subsequent years.

Personality change in retirement

In contrast to the general consensus that retirement is a major life transition (Theriault, 1994) that might deeply affect patterns of everyday activities and social network composition, there exists surprisingly little research on retirement in relation to aspects of personality trait change. One notable exception is the study of Löckenhoff et al. (2009) that we already discussed in the first part of our review. This study did not only examine longitudinal effects of the Big Five personality traits but also scrutinized reciprocal relations between personality and retirement transition. For most aspects of personality, longitudinal analyses revealed high levels of stability across the retirement transition. However, a number of significant retirement-related changes in more specific aspects of extraversion and agreeableness, as represented in the revised NEO personality inventory facet scales, were observed. After retirement, participants described themselves as less fast-paced and vigorous (decreased E4: activity) as well as less competitive and argumentative (increased A4: compliance) than before. Although evidence is still scarce, these examples carefully suggest that retirement might come with a specific set of challenges relevant to personality development.

Conclusions

We here presented studies from the personality and development fields that provide evidence for reciprocal relations between personality and work across different career stages. First, graduation from high school was identified as one of the primary transitional experiences in an individual's prevocational life calling for personality changes in the direction of greater maturity. In the same line, college experiences are predicted by and predict personality traits, and different life paths (educational vs vocational tracks) during this demographically dense period of emerging adulthood seem to play a significant role therein. When eventually entering the labor market, occupational choices are made that generally serve to reinforce and deepen those personal characteristics that got people selected into these work environments in the first place, a mechanism referred to as the correspondence principle. Similarly, certain traits, such as emotional stability, predict the establishment of career success, a process that in turn contributes to normative personality development (e.g., increases in emotional stability).

Findings such as these are consistent with the perspective we have previously adopted: Different stages of vocational development present dynamic and specific challenges to individuals relevant for personality development, and successful work role investment generally elicits trait changes in the direction of greater functional maturity. However, as we will discuss later, the relatively small amount of research that is available on this topic at the same time calls for a number of refinements of this theoretical perspective to make it a promising avenue for future research and theory building in IWO settings.

Discussion

In this review, we first highlighted the ways in which personality contributes to the paths people take in their working lives and their effectiveness and success, followed by the ways in which work contributes to establishment, development, and change of people's personality. This final section is intended to integrate these two separate literatures. One observation from this review is that research on the longitudinal, dynamic, and reciprocal associations between work and personality constitutes quite a small literature. This most likely reflects the difficulty and the strong methodological requirements for conducting such research. That said, it is obvious that there is an urgent need for more longitudinal studies of personality and work and their reciprocal effects. Moreover, it is clear that various implications for conceptual development and empirical research in IWO psychology emerge when blending these two detached research lines. These are discussed in greater detail in the sections that follow.

Implications for theory

The theoretical implications of integrating these separated research streams are manifold, although concentrate on three major issues at this stage, which have far-reaching consequences for theories of personality, work, and vocational experiences and contexts, and theories on person–organization fit and dynamics.

Do we need to reconsider the stability of traits?

This question first stems from the general observation that traits continue to develop throughout adulthood, as evidenced by normative change patterns established across different raters and cultures (McCrae & Terracciano, 2005). According to the five-factor theory of personality (McCrae & Costa, 2003), these normative changes result from a specific genetic predisposition to change, independent from environmental influences. An alternative explanation, however, is provided by perspectives emphasizing the role of social contextual factors on personality development, such as the social investment (Roberts et al., 2005) or sociogenic (Inkeles & Levinson, 1963) theory, which posits that investment in social institutions, including the work role, drive normative personality development.

Our review has shown not only that personality predicts career choices but also that our experiences in the work role influence personality change. However, we also showed that there may be vocation-specific or occupation-specific

effects on individual's personality development. Our review of the dynamic associations of personality and work outcomes indicated that traits that are accommodating in one vocational environment, or at a specific career or job stage, may be of less use or even a hindrance in others. Therefore, when the transactions between personality development and investment in the work role are studied, it seems crucial to take specific vocational characteristics into account (also Wille et al., 2012) to adequately model and understand individual personality developmental trajectories.

Our review highlights, for the first time in the IWO psychology literature, evidence suggesting reciprocal influences between personality and work experiences, which are nonnormative and rather dependent on vocational characteristics. Although it is unlikely to expect dramatic personality change, the literature today suggests normative *and* individual personality changes, challenging the assumption of traits as constructs that are not malleable or insensitive to change. Investment in the worker role is the mechanism to explain normative changes according to the social investment theory, whereas specific elements from the work environment or work experiences further impact on individual personality development trajectories. The implications of such findings are that personality theories will have to explain not only stability but also normative and individual changes, giving work experiences a key position in explaining individual developmental trajectories.

How to theoretically frame these reciprocal processes?

Although different theoretical frameworks exist to account for differences in the occupational environment affecting personality, these have remained largely absent from the literature on personality development and work experiences. In the following, we give a nonexhaustive overview of three well-established theories prominent in the IWO literature that are worth considering in this context.

A first theoretical perspective from the IWO literature that can help to better frame and understand reciprocity between personality and work is the Theory of Work Adjustment (Dawis & Lofquist, 1984). A basic assumption of this theory is that each individual seeks to achieve and maintain correspondence with the environment, and work represents a major environment to which most individuals must relate. In general, this dynamic process entails both active and reactive adjustment, the latter referring to an individual's attempts to change her or his behavioral tendencies, personal priorities, and/or work values to better suit the environment.

Second, in TAT (Tett & Burnett, 2003), behavior results from an interaction between person and situation, with situations acting as cues to activate certain traits. Specific traits are expressed in behavior when the situation or context allows freedom of trait expression, and when the features of the situation activate those specific traits. We proposed that TAT is relevant in the longitudinal examination of personality and its interaction with work because over time, the demands, contexts, and situational features of work are in a state of flux. Moreover, repeated activation of certain traits may, over time, stimulate trait changes tuned to the work environment.

Finally, a review of personality and career development theory would be incomplete without mentioning John Holland's (1997) seminal contribution to this area. To most organizational behavior and career researchers, Holland's theory is about the selection of personality-congruent vocational or educational environments. It is far less widely acknowledged, however, that this theory also explicitly describes reciprocal effects. It is, for instance, argued that people in enterprising environments acquire or are reinforced for traits such as ambition, energy, assertiveness, sociability, and so on (Holland, 1997, p. 47). A central but still heavily underexposed aspect of Holland's theory is about the (socialization) effects of vocational environments on those personality traits that selected people in these environments in the first place.

By discussing these different theories, it is clear that these need to be considered as complementary rather than competing or mutually exclusive frameworks, as they mainly differ in the explanatory processes about how traits and elements from the work environment are intertwined but are convergent on the central notion of interdependency of traits and work characteristics that mutually affect each other. The implications are as follows: (i) that reciprocal processes between traits and occupational characteristics can be studied from these different theoretical frames; (ii) that findings from reciprocal research should be integrated into these different theories; and (iii) that elements from all perspectives will have to be incorporated into a dynamic developmental model (DDM) of *personality* and *work*.

Toward a dynamic developmental model of personality and work

We believe that there is sufficient evidence in our review to propose an initial version of a DDM of personality and work, which integrates all key theoretical perspectives we have touched upon. In this DDM, traits represent dispositions and serve to describe what people do (e.g., patterns of behavior or performance at work), as well as help explain why they do (e.g., why people end up in particular occupations and job environments). Importantly, traits should be conceptualized as being in constant interaction with work-related activities and environments and activated in the context of different career stages and job contexts.

In early life, traits lead children to develop preferences for certain work activity, learn associated competencies and skills, and establish vocational identities. Collectively, these processes set people on a pathway of education and training, which in part reflect their interests, but within which success is dependent on a core set of performance and learning-related traits (e.g., conscientiousness, emotional stability, and openness), which help to motivate people to work hard, master new things, and approach tasks without fear of failure. The corresponsive principle proposes that as such traits are activated and used, they are strengthened and deepened, so that by giving advantage in education, they may give similar advantage in working life, explaining the longitudinal association of these traits with career and life success.

As people enter the working world, their choices are influenced by personality and preferences for occupational characteristics. People are attracted to tasks and activities that appeal to and suit their traits. Sociogenic theory and social investment theory propose that the work that people do influences the development of their traits, and the longer a person works in a particular career path, the more invested he or she is, and the deeper is the dependence of traits on work experience. From a TAT perspective, this might represent the repeated activation and automatization of situational responses. By these mechanisms, the mere participation in the working world leads to our work becoming a core part of our personality and, although we are on a stable and established career path, contributing to the long-term stability of our identity and personality.

The longitudinal stability of personality may owe much to the processes of developing preferences for activities, practicing them, applying them in a job, strengthening them, and then remaining in a career in which they are persistently activated from age 25 through to 65. Over time, the dynamic demands of jobs mean that different traits are likely to be relevant to performance and success, and this perspective helps us move our understanding on from the cross-sectional or short-term validity of traits for predicting performance to a richer understanding of when, how, and in what ways personality traits might help us understand the divergences, convergences, twists, and turns of people's working lives.

Avenues for future empirical research

At the backdrop of our review, it becomes clear that there are almost no studies that examine the reciprocal effects of personality and work in the IWO literature. All of the studies we have reviewed on this issue are more aligned to the personality and developmental literature. We have positioned work as being arguably the most important institutional contextual influence on personality in people's lives, and the absence of a literature on how work affects personality development may represent one of the biggest oversights in the field. Studies in this area may more clearly reinforce the centrality of IWO psychology in understanding personality. In the following, we highlight some avenues for future research.

Trait development and work congruence
As noted earlier, one finding from our review is about how work contributes to trait stability through reinforcing traits in a reciprocal way. The relationship in this case is one of congruence, by which traits are congruent with work environments. In this context, it is important to know what kind of environmental characteristics affect and deepen specific traits, and especially how salient such characteristics or how frequent or intense such work experiences need to be for impacting upon traits. In addition, we do not know whether some traits are more vulnerable to change than others given specific appropriate environmental characteristics. We believe that the concept of congruence and deepening of traits is

particularly relevant for selection researchers, selecting for specific personality profiles. The issue at stake here is how such desirable profiles can be progressively deepened and consolidated, by exposing new recruits to congruent first work experiences. Research on how such congruence can be achieved is strongly warranted.

Any such consideration of selection assessment in this respect inevitably must consider questions around measurement of personality. Our DDM of personality and work may present a new perspective from which to address questions about frame-of-reference effects on validity (Lievens, De Corte, & Schollaert, 2008), impression management in selection assessment, and the merits of alternative measurement strategies to trait inventories, such as situational judgment tests.

Trait development and work incongruence

Individuals may also experience incongruence between their traits and the environment. What might the implications be for personality change in such cases? An example of incongruence would be an introverted person who decides or finds himself or herself in a job that requires her or him to be more extraverted and sociable. The traditional perspective would be that such conflict results in strain and that behavior would persistently be perceived by the person as in conflict with their personality. From our DDM of personality and work, an alternative outcome might be a real shift in personality traits as a response to the incongruence. Although it is unlikely that a person low on extraversion will suddenly become high on the dimension, a modest change might be a possibility. The concept of incongruence and its consequences is extremely important for IWO psychologists interested in targeted personality change. Coaching and development, for instance, often involve helping people to understand strengths and areas of inconsistency between traits and work requirements. So a further area for new research is on personality trait change in response to incongruence and developmental interventions such as coaching, training, or on-job learning.

Career developmental transitions in contemporary working life

The contemporary protean career perspective implies increased career mobility, with more frequent job changes but also prolonged careers, including new developmental transition points. Whereas the beginning career phase typically included multiple transition roles (leaving school, start living independently, entering a job, having the first stable relationship(s), etc.), the changing career landscape, involving multiple jobs over an extended time interval ranging from 21 to beyond 65, introduces new challenges for research. Questions about the role of personality in this new career context remain unanswered in research.

The contemporary context of careers also raises important wider social issues relevant to personality development and work. For example, there may be implications of our DDM of personality and work for how we understand gender stereotyping of occupations and gender differences in personality. Moreover, an understudied area uncovered in our review is post-work experience. There is a lack of literature particularly on the longitudinal personality associates of retirement. Yet next to entry into the working world, the retirement transition is potentially one of the most important contexts for adjustment and change. Given the importance of work as a context for behavior through most of adult life, the sudden removal of that context is almost certain to have developmental consequences. We believe this constitutes an important area for future research with far-reaching consequences for IWO psychology and society in general.

Methodological considerations

In developing literature in this area, methodological challenges are presented by the need for longitudinal designs and analyses that model change. In-depth reviews of these methodological issues are already available (Ferrer & McArdle, 2010; Ployhart & Vandenberg, 2010), but here, we will comment on a selected number of important decisions to be made when setting up studies intended to address the longitudinal dynamic and developmental interplay of personality and work.

First, empirical tests of our initial DDM of personality and work require true longitudinal designs in which both the personality *and* the work aspects of interest are tracked over time. Two important choices need to be considered

in this context. First, the number of assessments needs to be decided upon, an issue that has also extensively been discussed elsewhere (Ployhart & Vandenberg, 2010). In the context of the research topic addressed in this review and keeping in mind the relative dearth of studies that has investigated reciprocity in work and personality, we would argue that two assessment points (or waves) are the absolute minimum. However, designs with three or more waves of data offer a number of important advantages with regard to the statistical modeling of change, including the possibility to examine nonlinear change *trajectories* and a closer examination of the directionality in reciprocal effects. Nevertheless, valuable insights in this relatively young field of research on the reciprocity of work and personality have already resulted from excellent studies that adopted the right statistical techniques to study change using two-wave designs (e.g., Wu & Griffin, 2012).

A second, related decision concerns the length of the time intervals, which should be guided by relevant theory. When studying reciprocal effects between work and personality, it is important to bear in mind that personality change is modest in nature. Typically, individuals do not experience dramatic transformation but rather gradually develop over long periods (e.g., 10 years; Roberts & Wood, 2006). Many of the studies that we reviewed here indeed drew on longitudinal data collection projects that spanned over 5–10 years. However, some studies also adopted a different strategy, focusing on theoretically critical development points (e.g., Bleidorn, 2012; examining high-school graduation). We see this as a good example of how to study the effects of important transition moments in the professional career on aspects of personality without having to invest in a 10-year longitudinal design.

Analytical considerations

Alongside appropriate longitudinal study design comes the selection of appropriate statistical models for examining dynamics. One such approach is latent change score (LCS) models (McArdle, 2009). This technique has remained rather absent from the IWO literature. LCS models combine assessment of change (i.e., growth or decline) and dynamics among multiple processes and are therefore particularly appropriate to evaluate hypotheses involving both interrelations among various constructs and changes in those constructs over time (Ferrer & McArdle, 2010).

However, a limitation of LCS is that no causal inferences are justified. Although LCS models enable analyses that attenuate ambiguities in the *directional effects* between interrelated processes, this is not equivalent to establishing causal inferences. For those, researchers would need to combine the dynamic longitudinal methodology described earlier with experimental designs that can rule out third-variable effects. Clearly, such studies are challenging to carry out in the context of reciprocal effects between personality and work. However, we invite scholars to come up with creative research that combines the strengths of longitudinal approaches with more experimental approaches. We further encourage IWO scholars to be inspired by research from other disciplines in psychology, such as developmental psychology, where such methodologies are more widely adopted.

Epilogue

Just like this review has demonstrated not only longitudinal but also reciprocal influences between traits and occupational characteristics, its discussion should be seen as a call for IWO and personality psychologists to join research lines that mutually fertilize each other's discipline with real impact on their respective professional fields. In the nineties, trait psychology got a strong boost via the meta-analytic work performed in IWO psychology underscoring the validity of traits to predict various occupational criteria. We hope that our review of some challenging research findings in the area of developmental personality psychology and the identification of some promising research lines have a similar effect on research in IWO psychology.

Author biographies

Stephen A. Woods is a Senior Lecturer at Aston Business School and a Chartered Occupational Psychologist. He is known for his research on personality trait assessment, and recruitment and selection, and his recent research and publications include a major contribution to the literature on vocational development, examining the influence of childhood personality traits on occupational choices in midlife. He is an editorial board member for the *Journal of Occupational and Organizational Psychology*.

Filip Lievens is a Professor at the Department of Personnel Management and Work and Organizational Psychology of Ghent University, Belgium. He is the author of over 100 articles in the areas of personnel recruitment and selection. He serves in the editorial board of both the *Journal of Applied Psychology* and *Journal of Personnel Psychology*.

Filip De Fruyt is a Professor in Differential Psychology and Personality Assessment at Ghent University in Belgium. He served as an associate editor of the *European Journal of Personality* from 2000 to 2004 and is still a consulting editor of the *European Journal of Personality*, the *International Journal of Selection and Assessment*, the *Journal of Personality Disorders*, the *Review of Work and Organizational Psychology*, and the *Journal of Personality and Social Psychology* (section Personality Processes and Individual Differences). He has (co-)authored over 100 papers and chapters in a broad range of leading international academic journals.

Bart Wille is a Doctoral student at Ghent University studying personality development during work transitions.

References

Alarcon, G., Eschleman, K. J., & Bowling, N. A. (2009). Relationships between personality variables and burnout: A meta-analysis. *Work and Stress*, *23*, 244–263. doi: 10.1080/02678370903282600.

Armon, G., Shirom, A., & Melamed, S. (2012). The Big Five personality factors as predictors of changes across time in burnout and its facets. *Journal of Personality*, *80*, 403–427. doi: 10.1111/j.1467-6494.2011.00731.x.

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469–480. doi: 10.1037/0003-066X.55.5.469.

Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta analysis. *Personnel Psychology*, *44*, 1–26. doi: 10.1111/j.1744-6570.1991.tb00688.x.

Barrick, M. R., Mount, M. K., & Strauss, J. P. (1993). Conscientiousness and performance of sales representatives: Test of the mediating effects of goal-setting. *Journal of Applied Psychology*, *78*, 715–722. doi: 10.1037//0021-9010.78.5.715.

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. *Personality and Social Psychology Bulletin*, *38*, 12, 1594–1608. doi: 10.1177/0146167212456707.

Bono, J. E., & Judge, T. A. (2003). Core self-evaluations: A review of the trait and its role in job satisfaction and job performance. *European Journal of Personality*, *17*, 5–18. doi: 10.1002/per.481.

Chamorro-Premuzic, T., & Furnham, A. (2003). Personality predicts academic performance: Evidence from two longitudinal university samples. *Journal of Research in Personality*, *37*, 319–338.doi: 10.1016/s0092-6566(02)00578-0.

Costa, P. T., & McCrae, R. R. (2006). Age changes in personality and their origins: Comment on Roberts, Walton, and Viechtbauer (2006). *Psychological Bulletin*, *132*, 26–28. doi: 10.1037/0033-2909.132.1.26.

Dawis, R. V., & Lofquist, L. H. (1984). *A psychological theory of work adjustment*. Minneapolis: University of Minnesota Press.

De Fruyt, F., & Mervielde, I. (1999).RIASEC types and Big Five traits as predictors of employment status and nature of employment. *Personnel Psychology*, *52*, 701–727. doi: 10.1111/j.1744-6570.1999.tb00177.x.

Deary, I. J., Watson, R., & Hogston, R. (2003). A longitudinal cohort study of burnout and attrition in nursing students. *Journal of Advanced Nursing*, *43*, 71–81. doi: 10.1046/j.1365-2648.2003.02674.x.

DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, *124*, 197–229. doi: 10.1037/0033-2909.124.2.197.

Erez, A., & Judge, T. A. (2001). Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology*, *86*, 1270–1279. doi: 10.1037//0021-9010.86.6.1270.

Ferrer, E., & McArdle, J. J. (2010). Longitudinal modeling of developmental changes in psychological research. *Current Directions in Psychological Science*, *19*, 149–154. doi: 10.1177/0963721410370300.

Ferris, D. L., Rosen, C. R., Johnson, R. E., Brown, D. J., Risavy, S. D., & Heller, D. (2011). Approach or avoidance (or both?): Integrating core self-evaluations within an approach/avoidance framework. *Personnel Psychology*, *64*, 137–161. doi: 10.1111/j.1744-6570.2010.01204.x.

Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist*, *48*, 26–34.

Gottfredson, L. S. (2002). Where and why g matters: Not a mystery. *Human Performance*, *15*, 25–46.

Harms, P. D., Roberts, B. W., & Winter, D. (2006). Becoming the Harvard man: Person–environment fit, personality development, and academic success. *Personality and Social Psychology Bulletin*, *32*, 851–865. doi: 10.1177/0146167206287720.

Hartung, P. J., Porfeli, E. J., & Vondracek, F. W. (2005). Child vocational development: A review and reconsideration. *Journal of Vocational Behavior*, *66*, 385–419. doi: 10.1016/j.jvb.2004.05.006.

Heller, D., Judge, T. A., & Watson, D. (2002). The confounding role of personality and trait affectivity in the relationship between job and life satisfaction. *Journal of Organizational Behavior*, *23*, 815–835. doi: 10.1002/job.168.

Hoekstra, H. A. (2011). A career roles model of career development. *Journal of Vocational Behavior*, *78*, 159–173. doi: 10.1016/j.jvb.2010.09.016.

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd edn). Odessa, FL: Psychological Assessment Resources, Inc.

Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The Big Five revisited. *Journal of Applied Psychology*, *85*, 869–879. doi: 10.1037/0021-9010.85.6.869.

Inkeles, A., & Levinson, D. J. (1963). The personal system and the sociocultural system in large-scale organizations. *Sociometry*, *26*, 217–229.

Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology*, *85*, 237–249. doi: 10.1037/0021-9010.85.2.237.

Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, *87*, 530–541. doi: 10.1037//0021.9010.87.3.530.

Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The Big Five personality traits, general mental ability, and career success across the life span. *Personnel Psychology*, *52*, 621–652. doi: 10.1111/j.1744-6570.1999.tb00174.x.

Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of Applied Psychology*, *87*, 797–807. doi: 10.1037/0021-9010.87.4.797.

Judge, T. A., Klinger, R., Simon, L. S., & Yang, I. W. F. (2008). The contributions of personality to organizational behavior and psychology: Findings, criticisms, and future research directions. *Social and Personality Psychology Compass*, *2*(5), 1982–2000. doi: 10.1111/j.1751-9004.2008.00136.x.

Lievens, F., De Corte, W., & Schollaert, E. (2008). A closer look at the frame-of-reference effect in personality scale scores and validity. *Journal of Applied Psychology*, *93*, 268–279.

Lievens, F., Ones, D. S., & Dilchert, S. (2009). Personality scale validities increase throughout medical school. *Journal of Applied Psychology*, *94*, 1514–1535. doi: 10.1037/a0016137.

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review*, *11*, 68–86. doi: 10.1177/1088868306294590.

Löckenhoff, C. E., Terracciano, A., & Costa, P. T., Jr. (2009). Five-factor model personality traits and the retirement transition: Longitudinal and cross-sectional associations. *Psychology and Aging*, *24*, 722–728. doi: 10.1037/a0015121.

Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology*, *101*, 620–637. doi: 10.1037/a0023743.

McArdle, J. J. (2009). Latent variable modeling of differences and changes with longitudinal data. *Annual Review of Psychology*, *60*, 577–605. doi: 10.1146/annurev.psych.60.110707.163612

McCrae, R. R., & Costa, P. T. (2003). *Personality in adulthood: A five-factor theory perspective* (2nd edn). New York, NY: Guilford Press.

McCrae, R. R., & Terracciano, A. (2005). Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology*, *88*, 547–561. doi: 10.1037/0022-3514.88.3.547.

Minbashian, A., Earle, J., & Bright, J. E. H. (2013). Openness to experience as a predictor of job performance trajectories. *Applied Psychology: An International Review*, *62*, 1–12. doi: 10.1111/j.1464-0597.2012.00490.x.

Mischel, W., & Shoda, Y. (1998). Reconciling contextualism with the core assumption of personality psychology. *Annual Review of Psychology*, *49*, 229–258.

Moscoso, S., & Salgado, J. F. (2004). "Dark side" personality styles as predictors of task, contextual, and job performance. *International Journal of Selection and Assessment*, *12*, 356–362. doi: 10.1111/j.0965-075X.2004.00290.x.

Murphy, K. (1989). Is the relationship between cognitive ability and job performance stable over time? *Human Performance*, *2*, 183–200. doi: 10.1207/s15327043hup0203_3.

Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. *Journal of Management*, *36*, 94–120. doi: 10.1177/0149206309352110.

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, *84*, 582–593. doi: 10.1037/0022-3514.84.3.582.

Roberts, B. W., & Chapman, C. N. (2000). Change in dispositional well-being and its relation to role quality: A 30-year longitudinal study. *Journal of Research in Personality*, *34*, 26–41. doi: 10.1006/jrpe.1999.2259.

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, *126*, 3–25. doi: 10.1037/0033-2909.126.1.3.

Roberts, B. W., O'Donnell, M., & Robins, R. W. (2004). Goal and personality trait development in emerging adulthood. *Journal of Personality and Social Psychology*, *87*, 541–550. doi: 10.1037/0022-3514.87.4.541.

Roberts, B. W., Robins, R. W., Caspi, A., & Trzesniewski, K. H. (2003). Personality trait development in adulthood. In J. Mortimer & M. Shanahan (Eds.), *Handbook of the life course*. New York, NY: Plenum Press.

Roberts, B. W., Walton, K., Bogg, T., & Caspi, A. (2006). De-investment in work and non-normative personality trait change in young adulthood. *European Journal of Personality*, *20*, 461–474. doi: 10.1002/per.607.

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*, 1–25. doi: 10.1037/0033-2909.132.1.1.

Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In D. K. Mroczek, & T. D. Little (Eds.), *Handbook of personality development*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Roberts, B. W., Wood, D., & Smith, J. L. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality*, *39*, 166–184. doi: 10.1016/j.jrp.2004.08.002.

Salgado, J. F. (1997). The five factor model of personality and job performance in the European Community. *Journal of Applied Psychology*, *82*, 30–43. doi: 10.1037/0021-9010.82.

Saucier, G., & Goldberg, L. R. (1996). The language of personality: Lexical perspectives on the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality, theoretical perspectives* (pp. 21–50). New York, NY: Guilford.

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, *91*, 1152–1165. doi: 10.1037/0022.3514.91.6.1152.

Stewart, G. L. (1999). Trait bandwidth and stages of job performance: Assessing differential effects for conscientiousness and its subtraits. *Journal of Applied Psychology*, *84*, 959–968. doi: 10.1037/0021-9010.84.6.959.

Super, D. E. (1980). A life span, life space approach to career development. *Journal of Vocational Behavior*, *13*, 282–298. doi: 10.1016/0001-8791(80)90056-1.

Sutin, A. R., Costa, P. T., Miech, R., & Eaton, W. W. (2009). Personality and career success: Concurrent and longitudinal relations. *European Journal of Personality*, *23*, 71–84. doi: 10.1002/per.704.

Tellegen, A. (1982). Brief manual of the multidimensional personality questionnaire. University of Minnesota.

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, *88*, 500–517. doi: 10.1037/0021-9010.88.3.500.

Tett, R. P., Jackson, D. N., Rothstein, M., & Reddon, J. R. (1994). Meta analysis of personality job performance relations: A reply to Ones, Mount, Barrick & Hunter (1994). *Personnel Psychology*, *47*, 157–172. doi: 10.1111/j.1744-6570.1994.tb02415.x.

Theriault, J. (1994). Retirement as a psychological transition: Process of adaptation to change. *International Journal of Aging & Human Development*, *38*, 153–170.

Thoresen, C. J., Bradley, J. C., Bliese, P. D., & Thoresen, J. D. (2004). The Big Five personality traits and individual job performance growth trajectories in maintenance and transitional job stages. *Journal of Applied Psychology*, *89*, 835–853. doi: 10.1037/0021-9010.89.5.835.

Tracey, T. J. G. (2001). The development of structure of interests in children: Setting the stage. *Journal of Vocational Behavior*, *59*, 89–104. doi: 10.1006/jvbe.2000.1787.

Wang, M. (2007). Profiling retirees in the retirement transition and adjustment process: Examining the longitudinal change patterns of retirees' psychological well-being. *Journal of Applied Psychology*, *92*, 455–474. doi: 10.1037/0021-9010.92.2.455.

Wille, B., Beyers, W., & De Fruyt, F. (2012). A transactional approach to person–environment fit: Reciprocal relations between personality development and career role growth across young to middle adulthood. *Journal of Vocational Behavior*, *81*(3), 307–321.

Wille, B., De Fruyt, F., & De Clercq, B. (2013). Expanding and reconceptualizing aberrant personality at work: Validity of five-factor model aberrant personality tendencies to predict career outcomes. *Personnel Psychology*, *66*, 173–223.

Wood, D., & Roberts, B. W. (2006). Cross-sectional and longitudinal tests of the Personality and Role Identity Structural Model (PRISM). *Journal of Personality*, *74*, 779–809. doi: 10.1111/j.1467-6494.2006.00392.x.

Woods, S. A., & Hampson, S. E. (2010). Predicting adult occupational environments from gender and childhood personality traits. *Journal of Applied Psychology*, *95*, 1045–1057. doi: 10.1037/a0020600.

Woods, S. A., Patterson, F., & Koczwara, A. (2013). Personality and occupational specialty: An examination of the Big Five and medical specialty choice. *Proceedings of the Division of Occupational Psychology Conference*, 2013, Chester.

Wu, C.-H., & Griffin, M. A. (2012). Longitudinal relationships between core self-evaluations and job satisfaction. *Journal of Applied Psychology*, *97*, 331–342. doi: 10.1037/a0025673.

Zyphur, M. J., Bradley, J. C., Landis, R. S., & Thoresen, C. J. (2008). The effects of cognitive ability and conscientiousness on performance over time: A censored latent growth model. *Human Performance*, *21*, 1–27. doi: 10.1080/08959280701521967.

Zyphur, M. J., Chaturvedi, S., & Arvey, R. D. (2008). Job performance over time is a function of latent trajectories and previous performance. *Journal of Applied Psychology*, *93*, 217–224. doi: 10.1037/0021-9010.93.1.217.