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Personality and career advancement: A reciprocal approach

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Bart Wille, november 2012

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Introduction

When meeting a stranger, how convenient is it to ask him/her “*What (s)he does for a living*”? Besides from breaking the ice, very often this question in all its simplicity also serves a deeper goal. Job titles automatically activate stereotypical beliefs about people’s personal characteristics. Geriatric helpers should be caring, sales representatives are smooth, and tax accountants are considered to be strict. Knowledge about someone’s profession is frequently (and often implicitly) used as a first source of information about that person, because it is generally assumed that people try to choose occupations that match their personal interests, competencies, and ambitions. Moreover, occupations are considered informative because they constitute a specific context in which these personal characteristics can be further developed.

Although this line of reasoning is constantly applied in our day-to-day functioning, it has remained severely under-addressed in the field of Organizational Behavior (OB). Specifically, the assumptions described above illustrate a perspective of *dynamic reciprocity* between personality and work, whereby personal characteristics shape and are shaped by occupational experiences. The general topic of this dissertation is to advance our knowledge on both directions of influence in this model, i.e. from personality to occupations and vice versa, by using a long-term career perspective. As we will see along the different studies covered in this dissertation, the association between personality and career advancement is a complex one, and long-term prospective studies in many cases shed a new light on relationships that have previously been established in cross-sectional research. Furthermore, ignoring reciprocity in this association is perhaps one of the biggest oversights in the fields of organizational and career psychology.

Personality and Organizational Behavior: A Love-Hate Relationship

Over the past quarter century, few topics in OB and work and organizational psychology have attracted more pages of journal space than

personality research. Interestingly, this stream of research has known quite a dramatic turnaround during this period of time. Before the 1990s, personality research in OB was mainly surrounded by skepticism. One influential article questioning the relevance of traits for organizational behavior criteria flatly labeled dispositional effects as illusory (Davis-Blake & Pfeffer, 1989). From the beginning of the 1990s, however, personality has established an increasingly important position in the OB literature, and three pieces of evidence were especially influential in this process (Judge, Klinger, Simon, & Yang, 2008). First, the availability of meta-analyses allowed for an accumulation of results across studies. In the area of personality research in particular, this development was important given the myriad traits that had been considered over decades of scientific research. Second, and related, consensus on the Five-Factor Model of personality (FFM; McCrae & Costa, 1987) now provided researchers with a common framework to organize the diverse set of traits, again enabling accumulation of results. Finally, there was growing evidence in the personality literature supporting the enduring nature of personality traits (Roberts & DelVecchio, 2000), which greatly serves applied psychologists primarily interested in trait validity effects. From the vantage point of today, personality has shown itself relevant to a broad range of criteria that are of interest to Industrial, Work, and Organizational (IWO) psychologists, including work motivation, job attitudes, leadership, stress, team effectiveness and behavior, and indicators of individual and group performance (see Judge et al., 2008).

Personality and Career Advancement: Toward a Reciprocal Model

Undoubtedly the most intensive application of personality research in organizational settings has been in relation to job performance. Although not without debate (e.g., Morgeson et al., 2007), the overall consensus is now that personality traits are relevant for explaining why someone is successful or not in his/her job (Penney, David, & Witt, 2011). As a natural extension of this research on job performance, studies have also started to look at the prolonged effects of traits in terms of career success. The idea is that if one is successful in his/her job, then, over time, this should also result in greater career success,

commonly defined in terms of the positive psychological and work-related outcomes accumulated as a result of one's work experiences (Judge, Cable, Boudreau, & Bretz, 1995). Indeed, there is now substantial evidence that general personality traits not only explain performance on the job, but also relate to traditional indicators of objective (e.g., income and ascendancy) and subjective (e.g., job and career satisfaction) career success (Judge & Kammeyer-Mueller, 2007).

The present dissertation is to be situated in the broad literature on personality and career advancement, the latter broadly defined as "the process of progressing throughout one's career". This process also includes the establishment of career success, but at the same time is broader than that. The present dissertation not only considers positive work-related outcomes, but also includes potential negative side-effects of career progression (e.g., the experience work-family conflict). Moreover, in addition to these evaluative criteria (positive versus negative outcomes), career advancement in this dissertation also covers content-related aspects of progression, for example in terms of work role content. For a long time in the careers literature, models of advancement have been dominated by stage theories (e.g., Super, 1980) describing careers in terms of a relatively fixed sequence of worker roles. Although it is now widely accepted that contemporary careers, characterized by increasing instability and discontinuity, can no longer adequately be described along such stages (Richardson, Constantine, & Washburn, 2005), research on how careers evolve in this context of contemporary boundaryless careers is utterly lacking. The proposed implementation of longer career models (e.g., the 40-year career) makes such knowledge even more essential as one of the biggest challenges in future personnel management will be how to keep older workers motivated and to provide them with opportunities for further advancement.

Against this background, the aim of the present doctoral dissertation is threefold. First, although career success and career advancement are by definition processes that unfold over time, temporal aspects have largely been ignored in this field of research, and most evidence now comes from cross-sectional studies with data gathered at a single point in time. As a reaction to the

criticisms that can be raised to these concurrent research designs (see also Judge & Kammeyer-Mueller, 2007), a first aim of the present dissertation is to contribute to the literature on personality and career advancement by examining the long-term prospective effects of personality on various advancement criteria. Principally, such long-term investigations allow for stronger inferences regarding the causal direction of these associations. As we will see throughout this dissertation, the issue of directionality will become particularly prominent when evidence will be provided for reciprocal effects between personality and work (see third objective).

Second, and related, studies that have adopted a long-term perspective typically approached career advancement in an overly static manner, whereby personality traits were used to predict nature of employment assessed at one later point in time. In one recent study, for example, Woods and Hampson (2010) examined the extent to which childhood personality traits predict occupational environments measured 40 years later. Trait validities were interpreted as evidence for gravitation effects, reflecting the process through which people gradually evolve toward occupational environments that fit their personal characteristics. The design of their study, however, with only one measurement of occupational attainment, essentially did not allow for any tests of mechanisms or processes that *unfold over time*. Therefore, a second aim of the present dissertation involves examining the predictive validity of personality traits for more dynamic indicators of career advancement, such as changes in adjustment or work role content over time.

Finally, a third important aim of this dissertation entails the investigation of reciprocal relations between personality and career advancement. Personality research in OB typically conceptualizes personality as traits, and these traits are defined as enduring causal forces that predict organizationally relevant criteria, and are not themselves subject to change. Although this approach has greatly served applied psychologists primarily interested in predictive validity issues, this conceptualization no longer seems tenable in light of recent developments in the personality development domain. Specifically, a large body of evidence now illustrates that traits continue to develop throughout adulthood, with the

preponderance of change occurring between the ages of 20 and 40 years (Roberts, Robins, Caspi, & Trzesniewski, 2003). Moreover, there is increasing evidence showing that life experiences, including those at work, play a significant role in patterns of personality development in adulthood (Hudson, Roberts, & Lodi-Smith, 2012; Lüdtke, Roberts, Trautwein, & Nagy, 2011; Roberts, 1997; Roberts, Caspi, & Moffitt, 2003; Scollon & Diener, 2006; Sutin, Costa, Miech, & Eaton, 2009). Drawing on these recent insights from the personality literature, it is examined in the present dissertation to which extent this alternative conceptualization of personality, referred to as the neo-socioanalytical perspective (Roberts & Wood, 2006), can contribute to a more complete understanding of personality functioning at work.

Together, these three research objectives constitute the reciprocal approach to personality and career advancement (see Figure 1) that is the ultimate contribution of this dissertation to a long and successful history of personality research in work and organizational contexts.

Method

In order to adequately address these research objectives, a series of long-term prospective and longitudinal studies were conducted using data from an ongoing college alumni program that was initiated almost 20 years ago at the same department where the present dissertation was completed. This section gives an overview of the different data collection points in this project, the procedures that were adopted, and the different measures that were used at each assessment point¹. Table 1 gives an overview of the central study constructs in this dissertation, how and when they are assessed, and in which empirical chapters they are used.

Background and Wave 1

In the spring of 1994, final-year college students from the University of Ghent and the Catholic Industrial School of Ghent were asked to participate in an elaborate longitudinal program focusing on the labor market entrance of

¹ Note that more specific information regarding psychometric properties of measurement instruments are discussed in greater detail in those chapters where they are included.

students with a higher educational background. The initial objectives of this research project were threefold: (1) establishing reliable instruments to assess FFM personality traits and Holland's RIASEC vocational interests in a Flemish context, (2) clarifying the relations between the FFM domain factors and facets and Holland's interest types, and (3) investigating the validity of personality versus interests as predictors of labor market entrance and job and career attitudes.

Students were informed in large groups about the purpose of the study at the beginning of the courses. After the oral presentation, students received a package including a standard letter with information about the project, together with the inventories (see below) and an envelop to return the questionnaires to the leading investigator (Filip De Fruyt). Students who did not attend courses received the same mailing at their home address. Participation was voluntary but recommended in an accompanying letter by the chancellor of the university and the head of the Student Counseling Office. Anticipating future follow-up studies, students were also asked to write down their name and address on the inventories. They were assured that all information would be treated as confidential. Completed inventories were mailed in an envelop addressed to the leading investigator via the university postal distribution system. Students of the Industrial School returned questionnaires to the school secretary.

A sample consisting of 934 final year students (498 males, 436 females) enrolled in this research program by filling out extensive personality questionnaires three months prior to graduation (Wave 1). The sample covered a broad range of occupational interests, with university students (total $N = 741$) from all faculties being represented: Philosophy, History and Languages ($N = 153$), Law ($N = 121$), Sciences ($N = 63$), Applied Sciences (civil engineers; $N = 115$), Economics ($N = 71$), Psychology and Educational Sciences ($N = 96$), Applied Biological Sciences ($N = 19$), and Political and Social Sciences ($N = 102$). The students from the Industrial School ($N = 193$) were all industrial engineers.

The main focus of this initial data collection was on the assessment of personality traits and vocational interests. For this purpose, Five-Factor Model

personality factors and the underlying facets were assessed using a Dutch adaptation of the NEO-PI-R (Costa & McCrae, 1992), translated by Hoekstra, Ormel, and De Fruyt (1996). The Dutch Revised NEO Inventory is a faithful translation of the NEO-PI-R, with a factor structure and psychometric properties closely resembling the normative US Inventory. In addition, Holland's (Holland, 1958, 1968, 1985, 1997) vocational interests and personality types were assessed using an adaptation of the Self-Directed Search (SDS), originally developed by Holland (1979), and adapted and translated to Dutch by Hogerheijde, Van Amstel, De Fruyt, and Mervielde (1995). This instrument, abbreviated as BZO95, comprises four parallel scales to assess the six interest types (i.e. Realistic, Investigative, Artistic, Social, Enterprising, and Conventional).

Wave 2

About one year after finishing their studies, the entire sample was invited to participate in a first follow-up study. To that end, all 934 subjects were sent an invitation letter that was accompanied by an inventory assessing their current educational or occupational situation. A group of 612 participants, 327 males and 285 females, mailed back questionnaires. The employment status of this sample participating in the second phase of the longitudinal program was as follows: 335 (54.7%) subjects were employed, 26 (4.2%) were working under supervision (lawyers or architects), 160 (16.3%) were again studying, and 66 (10.8%) were not employed at the moment of the second measurement. The employment status of 25 subjects did not fit into the former categories; the majority was enrolled in an extra year to finish their dissertation.

The focus of this second data collection was on gathering information on the working participants' nature of employment one year after graduation and their levels of adjustment (e.g., satisfaction) at career entrance. Subjects described their current function with a Dutch/Flemish adaptation of the Position Classification Inventory (PCI), initially developed by Gottfredson and Holland (1991) and translated to Dutch/Flemish by Hogerheijde, De Fruyt, Van Amstel, and Mervielde (1995). The PCI assesses the resemblance of occupational

environments with Holland's RIASEC types, thus being an environmental equivalent of the person-oriented SDS/BZO95. Elements of early career adjustment were assessed with a Dutch/Flemish version of the Career Attitudes and Strategies Inventory, originally developed by Holland and Gottfredson (1994) and translated by De Fruyt, Hogerheijde, Van Amstel, and Mervielde. The CASI provides reliable information on nine key aspects of career attitudes, including job satisfaction, work involvement, skill development, dominant style, career worries, interpersonal abuse, family commitment, risk taking style, and geographical barriers. The Dutch/Flemish version of the CASI has satisfactory psychometric characteristics that closely resemble those reported in the US normative sample.

Wave 3

After more than a decade of radio silence, it was decided in 2007-2008 to reinvigorate this successful line of research by organizing a new set of follow-up studies of this college alumni sample. The general objectives of this project are bundled in the present doctoral dissertation.

The first step in organizing a second follow-up (Wave 3) was to track down as many of the original research participants as possible. This was accomplished in two stages. First, in February 2009 letters were sent out to the subjects' home addresses as reported in 1994. It was expected that some of the subjects would still be living on this address, which was in many cases the parental home. Otherwise, this address could also be occupied by someone related or familiar to the person we were looking for, providing us with one or more leads to localize him/her. This invitation letter contained a brief description and history of the research project, and the new follow-up was framed in the context of an alumni career tracking project, supported by the educational institute they graduated from 15 years ago. Recipients of the letter were asked to pass on any data that could help us to reach the addressee: Current email address, home address, telephone number or any other piece of information that could help us to contact the alumnus. In addition, people were also asked to inform us when the addressee was a total stranger to them. All

information could be passed on by letter (a stamped envelop was included), email or telephone. Four weeks later, a reminder was sent to those addresses that had not reacted to the initial letter. In total, 590 subjects (63.17% of the original sample of 934) could directly or indirectly be reached through this mailing and provided a valid email address².

For subjects that could not be reached with this mailing procedure, an alternative search was organized. Their names were entered in an online search engine (Google) and alternatively screened via social and professional network sites such as Facebook, Netlog, Plaxo Pulse, and LinkedIn. Through this online search, 60 additional subjects could be traced³, bringing the total number on 650 potential participants (69.59% of the entire 1994 sample).

When the search for subjects was ended⁴, each of the potential participants was sent an email containing further information on the research project and the request to participate⁵. Subjects that showed interest in our study could find three internet links at the bottom of the document, each link leading to an online questionnaire. As such, the survey was divided into three different modules. Together with the links, participants also received a personal login code, which was asked each time at the beginning of a questionnaire. Participants were encouraged to fully complete a module when they started it. However, the system also allowed participants to interrupt a questionnaire at any time and to complete it at a later moment, without having to start all over again. Surveys could be completed until July, 1st, 2009.

² This follow-up was entirely conducted online. Therefore, we needed the email addresses of our participants to pass on the URL's of our web based questionnaires. Participants that initially provided us with their current home address or telephone number were contacted again to obtain their email address.

³ In sum, 79 people were approached via internet. 18 of them turned out to be not the person we were looking for, but just shared the same name. In sum, 61 "valid subjects" could be contacted, and 60 of them were interested in our follow-up study.

⁴ The searching phase was ended on April 30th, 2009.

⁵ First, 30 emails were sent as a test case. A week later, when some of the participants had already completed all of the questionnaires and the system proved to work well, the other invitation mails were sent.

The first module focused on participants' personality. After asking for some descriptive information⁶, personality was again assessed using the Dutch authorized adaptation of the NEO-PI-R (Costa & McCrae, 1992; Hoekstra et al., 1996). In total, 366 participants (56% of the total sample of 650 subjects) provided complete self-reports of FFM personality traits. At the end of this first module, participants were also asked to pass on the email address of someone that could be contacted in the context of a personality peer assessment. Due to insufficient response rates, however, these peer assessments could not be included in any of the studies presented in this dissertation.

The second module of the survey aimed to describe and analyze participants' professional careers between 1994 and 2009. For this purpose, participants were first asked to break down this 15 year time period according to job and career changes (see Chapter 5 for more information on this procedure). Next, each of these career stages had to be evaluated in terms of six universal career roles, using an abbreviated version of the validated Dutch Career Roles Questionnaire (CRQ; Hoekstra, 2011) (see Chapter 6). In this manner, participants ($N = 260$) provided a personalized and detailed overview of their career trajectories across the first 15-year career half.

Finally, the third module of the web survey particularly focused on participants' current employment status in 2009. Only subjects that were professionally active at the time of this data collection were asked to complete this part of the online questionnaire. Subjects ($N = 247$) were specifically asked in this module to report on (a) some important employment characteristics (i.e., current job title, job category, industry, number of work hours per week), (b) extrinsic career outcomes (i.e. number of subordinates, management level, income), and (c) indicators of subjective career adjustment after 15 years of labor market experience. For the latter, the same Career Attitudes and Strategies Inventory (CASI) was used as in Wave 2, supplemented with a more specific Career Satisfaction Scale (Greenhaus, Parasuraman, & Wormley, 1990) and a Job Stress Scale (De Fruyt, 2002).

⁶ The following descriptives were asked in this module: date of birth, gender, marital state, occupational status, partner's occupational state, and number of children.

Wave 4

A final follow-up of the college alumni sample was conducted in the period October 2010 – December 2010. All 650 subjects that were identified at Wave 3 were sent a new invitation via email, asking them to take part in this final survey round. For those willing to participate, three internet links were provided at the bottom of the document, leading to three different online survey modules. Again, participants were allowed to interrupt and restart with their personal login code at any time. In total, 271 subjects (137 males and 134 females) completed the entire online survey.

The first module focused on reassessing subjects' vocational interests after 15 years of labor market experience, using the same interest measure (BZO95; Hogerheijde et al., 1995) that was also used at Wave 1. In the second module⁷, participants were asked to rate their current work environment in terms of Holland's RIASEC characteristics, using the Dutch/Flemish version of the Position Classification Inventory (Gottfredson & Holland, 1991; Hogerheijde et al., 1995) that was also used at Wave 2. Module three⁸, finally, aimed to assess participants' current levels of well-being, including measures of career satisfaction (Greenhaus et al., 1990), subjective psychological health (Subjective Vitality Scale; Ryan & Frederick, 1997), and general life satisfaction (Satisfaction with Life Scale; Diener, Emmons, Larsen, & Griffin, 1985).

A Note on Study Dropout

The overview above indicates that the number of participants varied substantially across the different data collection points and also across separated survey modules within one data collection. More detailed information on (a) sample composition, (b) attrition rates, and (c) the ways in which study dropout and data missings are handled, is provided in the different empirical chapters.

⁷ Only participants that were professionally active at the time of the survey were asked to complete this second module.

⁸ Data collected in this final part of the online survey have not been used in any of the empirical chapters included in the present dissertation, but will be included in studies that are now in preparation.

Overview of Chapters

An overview is provided below of the seven empirical chapters that were used to substantiate the proposed reciprocal approach to personality and career advancement. The different chapters can be read as independent papers, each one contributing to a specific subdomain in the broad literature on personality and career advancement. Note that the three research objectives (1. long-term prediction, 2. dynamic criteria, 3. reciprocal relationships) run like a common thread through these different chapters, but that they are not equally addressed in each of these studies. An overview of how these objectives are tackled across the different empirical chapters is provided in Table 2.

Chapter 1

In Chapter 1, we focus on the long-term predictive validity of FFM personality traits for extrinsic (objective) career success obtained 15 years later. Although concurrent associations between personality and indicators of extrinsic success have been demonstrated before (e.g., Bozionelos, 2004), longitudinal replications are still scarce (Judge & Kammeyer-Mueller, 2007). Moreover, the study contributes to this line of research by considering an extra motivational construct as a mediating mechanism between traits and success attainment. In accordance with Holland's (1985, 1997) conceptualization of interests as expressions of personality, we expect Enterprising interests in particular to explain trait-success associations. This study provides an alternative perspective on the underlying nature of these associations, which are typically understood in terms of prolonged effects of job performance (e.g., Boudreau & Boswell, 2001; Bozionelos, 2004; Judge, Higgins, Thoresen, & Barrick, 1999; Seibert, Crant, & Kraimer, 1999). In this alternative perspective, it is proposed that not everyone is to the same extent interested in achieving financial and/or hierarchical success, and that this is at least partly an expression of personality.

Chapter 2

Where Chapter 1 focuses on extrinsic career success, Chapter 2 addresses the long-term prospective effects of personality traits on intrinsic (subjective) career success. This aspect of career advancement is typically conceptualized in

terms of job and/or career satisfaction (e.g., Judge et al., 1995; Ng, Eby, Sorensen, & Feldman, 2005; Seibert & Kraimer, 2001), although recent calls have also been made to broaden the scope of this line of research in light of the drastic changes in the labor market (Gunz & Heslin, 2005; Heslin, 2005). This chapter contributes to the field by considering an additional set of two subjective success indicators that are relevant in the context of contemporary boundaryless careers. Departing from recent trends in the careers literature, we specifically identified perceived employability and work-family conflict as two subjective career outcomes that have remained remarkably absent from the success literature up until now (Judge & Kammeyer-Mueller, 2007). Using a prospective design, the long-term predictive validity of FFM domains for both success criteria is examined, and evaluated against concurrent personality-success associations. Moreover, facet level analyses are also explored in order to better understand these relatively new personality-success relationships.

Chapter 3

Still focusing on the long-term prospective effects of personality, Chapter 3 contributes to the literature by considering an additional set of subclinical aberrant personality tendencies as potentially relevant trait predictors in addition to the more commonly studied FFM general traits. Drawing on recent advances in the clinical literature on personality dysfunction (e.g., Widiger & Trull, 2007), this chapter first sets out an alternative approach to conceptualizing ‘dark side’ personality tendencies, namely in terms of underlying dimensions rather than categories. Next, a review is presented of how six aberrant personality tendencies (i.e. Schizotypal, Avoidant, Borderline, Antisocial, Narcissistic, Obsessive-Compulsive) have been studied previously in the I/O literature. Against this background, a long-term prospective study is presented to evaluate the validity and importance (relative to general personality tendencies) of these aberrant tendencies to predict a broad range of extrinsic and intrinsic advancement criteria. This study sheds a new light on traditional models of personality and career success that typically only consider ‘bright side’ traits (Judge & Kammeyer-Mueller, 2007), and suggests that such models could be

broadened to also include more ‘dark side’, ‘maladaptive’, or ‘aberrant’ personality tendencies.

Chapter 4

Chapters 1, 2, and 3 have in common that career advancement is approached in a static manner, assessing the level of success at a single point in time. In Chapter 4, for the first time in this dissertation we adopt a more dynamic approach and consider changes in work-related experiences as the outcome variables. Using an aging perspective, the focus of this study is on the long-term changes in two frequently studied work-related attitudes (i.e. job satisfaction and work involvement), and how changes in personality traits might operate as one of the underlying forces driving changes in attitudes over time. Recently, Ng and Feldman (2010) proposed such dispositional maturation processes to account for the age differences that are commonly reported in cross-sectional research on job attitudes. The present study is the first to empirically challenge this assumption of maturing attitudes, and moreover argues for a revision of the traditional dispositional approach to work-related attitudes, such that long-term changes in both dispositions and attitudes should be acknowledged. Finally, this chapter is also the first in this dissertation to consider the longitudinal association between traits and work experiences as bidirectional rather than unidirectional, taking another important step in the direction of a reciprocal approach to personality and career advancement.

Chapter 5

Chapter 5 corroborates this dynamic perspective on career advancement and focuses on actual career transitions (i.e. job instability) rather than attitudinal changes. This chapter specifically investigates the long-term predictive validity of personality traits and vocational interest characteristics, both assessed at the very beginning of the career, for future job changes across the subsequent 15-year time interval. The experience of job instability becomes an increasingly salient aspect in many employees’ working lives (Bernhardt, Morris, Handcock, & Scott, 1999; White, Hill, & Smeaton, 2004), and research on this topic is necessary to help us understand how individual careers unfold.

This chapter aims to contribute to the individual difference perspective on job mobility (Ng, Sorensen, Eby, & Feldman, 2007), which holds that one's career is, at least in part, governed by internal attributes like personality traits and vocational interests. Where previous research in this domain mainly focused on turnover intentions or single turnover behaviors (Zimmerman, 2008), this study is the first to examine such individual differences in relation to actual job moves over a prolonged period of time, highlighting the dynamic character of career advancement.

Chapter 6

Where Chapter 5 merely focused on the frequency of job transitions, Chapter 6 aims to describe career advancement over this time period in terms of changing work role content. This study is grounded in the rich literature on person-environment (PE) fit, and is the first to explicitly approach this cornerstone construct in career theory (Savickas, 2000) from a dynamic and interactive perspective. By integrating recent theory on personality development (Roberts & Wood, 2006) and career advancement (Hoekstra, 2011), this study examines the longitudinal and reciprocal associations between traits and career role growth across the first 15-year career half. For this purpose, participating subjects are asked to retrospectively reconstruct their past career trajectories, and to evaluate these different career transitions in terms of Hoekstra's (2011) taxonomy of six universal career roles (i.e. Expert, Maker, Presenter, Guide, Director, and Inspirator role). These career role trajectories are then related to individual patterns of personality trait change across the same time interval. This study provides unique insights into how personality shapes and is shaped by individual vocational tracks across a substantial and significant period in people's professional lives, further documenting the proposed reciprocal approach to personality and career advancement.

Chapter 7

Finally, Chapter 7 substantiates this reciprocal approach by including prospective rather than retrospective assessments of the work environment and by using a taxonomy of occupational characteristics (i.e. Holland's RIASEC

framework) that is well-established in the career literature. This research design offers the unique possibility to investigate the different aspects of the proposed reciprocal model of personality and career advancement, including occupational selection effects, active adjustment effects, reactivity effects, and correlated change. In terms of career theory, this study is the first to empirically challenge Holland's (1997) idea of "secondary effects" (p. 47), referring to changes in personality traits due to specific work environments.

Chapter 8

Finally, in Chapter 8 I will present the general conclusions and the theoretical and applied implications that follow from our reciprocal approach to personality and career advancement. In addition, some limitations and recommendations for future research will be discussed.

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Table 1

Overview of the various study constructs, their measurement instruments, assessment points, and distribution across the different empirical chapters

Study Constructs	Measurement Instruments	Assessment Points				Dissertation Chapters
		1994	1995	2009	2010	
FFM general traits	NEO-PI-R (Hoekstra et al., 1996)	X		X		1, 2, 3, 4, 5, 6, 7
FFM aberrant tendencies	NEO-PI-R (Hoekstra et al., 1996)	X		X		3
RIASEC vocational interests	SDS/BZO95 (Hogerheijde et al., 1995)	X			X	1, 5
RIASEC vocational environments	PCI (Hogerheijde et al., 1995)		X		X	7
Job instability	Interactive web application			X		5
Career roles	Short form CRQ (Hoekstra, 2011)			X		6
Work and career attitudes	CASI (Holland & Gottfredson, 1994)		X	X		2, 3, 4
Job stress	Job Stress Scale (De Fruyt, 2002)		X	X		3
Career satisfaction	Career satisfaction Scale (Greenhaus et al., 1990)			X	X	3
Extrinsic career outcomes	Survey			X		1, 3

Tables

Table 2

Overview of the research objectives across the different empirical chapters

Chapters	Research objectives		
	1. Long-term prediction	2. Dynamic criteria	3. Reciprocity
Chapter 1	X		
Chapter 2	X		
Chapter 3	X		
Chapter 4		X	X
Chapter 5	X	X	
Chapter 6		X	X
Chapter 7		X	X

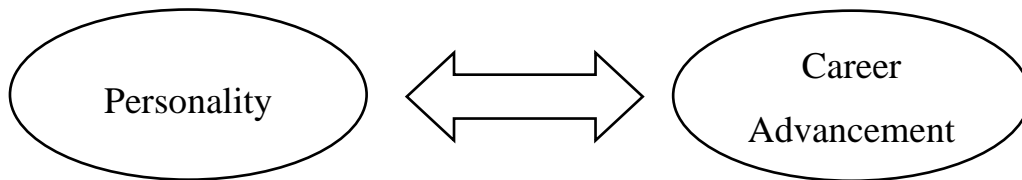
Figure

Figure 1. A reciprocal approach to personality and career advancement.

Chapter 1

Illuminating the road to success: Enterprising interests as a mediator between Big Five traits and extrinsic career success¹

Abstract

The present 15-year prospective study re-addressed the dispositional nature of extrinsic career success in a diverse sample of 192 Flemish college alumni. In an attempt to clarify the road to success, we introduced vocational interests into the study of personality-success relations. Consistent with prior research in this domain, our results demonstrated significant associations between Big Five traits and extrinsic career success: Management level was positively predicted by Extraversion; income was positively predicted by Extraversion and Conscientiousness, and negatively by Agreeableness. In addition, participants' Enterprising vocational interests, as expressed at the very beginning of the career, added significantly to the prediction of both success-indicators. Moreover, Enterprising interests at least partially mediated the effects of these personality traits on extrinsic career success. It is discussed that these results contribute to our understanding of the dispositional source of extrinsic career success, especially when examined in broad and diverse employee samples.

¹ Wille, B., & De Fruyt, F. (2012). Illuminating the road to success: Enterprising interests as a mediator between Big Five traits and extrinsic career success. *Manuscript submitted for publication*.

Introduction

Career success is commonly defined as the outcomes or achievements that individuals have accumulated as a result of their work experiences (Judge, Cable, Boudreau, & Bretz, 1995), and it is now widely accepted that career success encompasses both “extrinsic” success elements, reflecting objective and externally visible criteria such as pay and ascendancy (Jaskolka, Beyer, & Trice, 1985) and “intrinsic” aspects that are subjectively defined by the individual, such as career or job satisfaction (Gattiker & Larwood, 1988). As argued by Ng and colleagues (Ng, Eby, Sorensen, & Feldman, 2005; Ng & Feldman, 2010), career success is of concern to individual employees as well as to organizations. For individuals, it influences the standard of living they can enjoy, the sense of satisfaction they derive from their work, and their overall sense of well-being (Ng & Feldman, 2010). Career success is of interest to organizations, too, as employees’ personal success can contribute to organizational success (Judge, Higgins, Thoresen, & Barrick, 1999).

Given its significance, considerable research has been conducted over the past decades aimed at uncovering antecedents of career success. In addition to human capital attributes and demographic factors, increasing work has been done to address the dispositional source of career outcomes. It is argued that stable individual differences play an important role in determining career success, and personality traits in particular have received a great deal of attention given their effects on related domains of organizational behavior such as leadership (e.g., Lord, de Vader, & Alliger, 1986) and job performance (e.g., Barrick & Mount, 1991). To date, research has convincingly demonstrated the validity of the Five-Factor Model of personality (FFM; Costa & McCrae, 1985) to predict objective and subjective indicators of career success (e.g., Judge et al., 1999; Seibert & Kraimer, 2001; Wille, De Fruyt, & Feys, 2012; Wu, Foo, & Turban, 2008), although a number of issues in this context still require further attention. Particularly, more work is needed to better understand the intervening processes through which personality affects career outcomes (Boudreau & Boswell, 2001; Seibert & Kraimer, 2001).

For extrinsic career success in particular, the association with traits cannot be explained solely by dispositionally determined response tendencies or general evaluative standards. Instead, it has been noted that personality traits should affect extrinsic career success mainly through indirect processes (Bozionelos, 2004), and *job performance* is by far the most commonly suggested mediating mechanism (e.g., Boudreau & Boswell, 2001; Bozionelos, 2004; Judge et al., 1999; Ng et al., 2005; Seibert, Crant, & Kraimer, 1999). The idea is that certain personality traits are associated with aspects of job success, task-related and/or contextual, and that this subsequently translates into career success. However, apart from the fact that this assumption has hardly been directly tested (Ng & Feldman, 2010), a number of concerns can be formulated with regard to this performance based explanation. First, the association between personality traits and job performance itself is not without debate as research has shown that the occupational environment moderates personality-performance relations (Barrick & Mount, 1991). This issue of diversity across jobs is particularly an issue when examining personality-success relations in diverse samples of employees from various occupations and organizations, which is mostly the case (e.g., Bozionelos, 2004; Judge et al., 1999; Ng & Feldman, 2010; O'Connell & Sheikh, 2011; Seibert & Kraimer, 2001). Second, and related, findings regarding personality-performance associations not always align with the results concerning the effects of traits on career success. For example, while Conscientiousness has convincingly been demonstrated to be a fairly universal predictor of job performance (e.g., Barrick & Mount, 1991), its hypothesized association with career success has not always been confirmed (e.g., Rode, Arthaud-Day, Mooney, Near, & Baldwin, 2008; Seibert & Kraimer, 2001). Conversely, while Agreeableness showed to be an unimportant predictor of job performance even in jobs containing a large social component (e.g., sales or management) (Barrick & Mount, 1991, p. 21), research does indicate a negative relation between Agreeableness and extrinsic career success (e.g., Judge et al., 1999; Rode et al., 2008; Sutin, Costa, Miech, & Eaton, 2009). At least, these findings strongly suggest that processes other than job performance interfere as mediating mechanisms in personality-success relations.

In the present study, we try to further illuminate the road to success by introducing *vocational interests* as a potential mediator of the relation between personality traits and extrinsic success. Vocational interests have a well-established position in the career development literature and can theoretically be considered as “*expressions of personality*” (Holland, 1997, p. 8) that reflect our preferences for certain work activities and work environments. Their associations with personality traits are well-documented (e.g., Barrick, Mount, & Gupta, 2003) and they have been found to play a significant role in different stages of career unfolding (e.g., De Fruyt & Mervielde, 1999; Wille, De Fruyt, & Feys, 2010). We therefore believe it is warranted to consider vocational interests as potential intervening mechanisms in personality-success relations. We will specifically focus on Enterprising vocational interests as these particularly align with the motivational processes driving extrinsic success attainment.

The present study reports a 15-year prospective investigation of personality traits, vocational interests, and extrinsic career success in a longitudinal alumni sample. The contributions of this study are threefold: (1) Replicating personality-success associations using a longitudinal research design in which a cohort of college alumni are tracked across the first half of their professional career, (2) Expanding the individual difference approach to extrinsic career success by considering vocational interests as additional person level predictors, and (3) Further illuminating the road to success by exploring whether and how these career interests act as a mediating mechanism between personality traits and career outcomes.

Big Five Traits and Extrinsic Career Success from a Cross-Cultural and Longitudinal Perspective

Over the past decade, studies have convincingly demonstrated significant associations between indicators of extrinsic career success, such as income level and hierarchical attainment, and Big Five personality traits (e.g., Boudreau & Boswell, 2001; Bozionelos, 2004; Judge et al., 1999; Rode et al., 2008; Seibert et al., 1999; Sutin et al., 2009). However, further replication of these

associations is needed, as these (a) may vary across different cultures and (b) may be influenced by temporal effects (Boudreau & Boswell, 2001).

Although the preponderance of research on trait-success associations has been conducted in American contexts, some interesting differences across cultures have already been reported in the literature. In a British sample of white-collar workers, Bozionelos (2004) found a negative instead of a positive effect of Extraversion on extrinsic success, and cultural specificities were pointed out to account for these differences. It was assumed, for instance, that phlegm (i.e. low Extraversion and low Neuroticism) constitutes a typical British stereotype that may be valued and rewarded by British society. Although explanations like these are of course premature, such findings on cultural differences in trait-success associations at least call for additional research aimed at replicating personality-success associations across cultures.

Furthermore, much of previous work on personality-success associations has been done cross-sectionally, limiting its implications. Obviously, career success is a process that unfolds over time, and personality effects may depend on career stage and the time interval studied (Boudreau & Boswell, 2001). Moreover, a potential limitation of cross-sectional designs is that the independent and dependent variables can be reciprocally related. Although this issue has been downsized by previous trait-success researchers (e.g., Boudreau & Boswell, 2001; Bozionelos, 2004; Seibert & Kraimer, 2001), this position no longer seems tenable in light of recent findings regarding adult personality development (Roberts & Wood, 2006). Specifically, there is now increasing evidence that traits continue to develop throughout adulthood, and that the establishment of a successful career is related to interindividual differences in adult trait change (Roberts, Caspi, & Moffitt, 2003; Scollon & Diener, 2006; Sutin et al., 2009). Clearly, replicating personality-success associations using a prospective longitudinal research design is crucial in order to more firmly establish the direction of effects between personality and career outcomes (Seibert & Kraimer, 2001).

In the light of these concerns, our first research objective consisted of exploring to what extent the most commonly reported trait-success associations

could be replicated in our Flemish longitudinal college alumni study. Note that at this point we merely summarize recurrent empirical trait-success associations. The potential mediating mechanisms will be discussed later on, particularly focusing on Enterprising vocational aspirations.

An overview of the existing literature first indicates that the majority of studies have consistently shown positive associations between levels of Extraversion and indicators of objective career success, like salary and ascendancy (e.g., Boudreau & Boswell, 2001; Judge et al., 1999; Seibert & Kraimer, 2001). In addition, although less definite, extrinsic success has also been shown to correlate with Conscientiousness (e.g., Judge et al., 1999). Consistent with these earlier findings, we expect scores on Extraversion (*Hypothesis 1a*) and Conscientiousness (*Hypothesis 1b*) at the beginning of the career to be positively related to extrinsic career success 15 years later.

Neuroticism, conversely, has a significant and consistent negative association with extrinsic career success, indicating that characteristics such as emotional instability and anxiety are likely to hinder effective career management and reduce the likelihood of career sponsorship (Boudreau & Boswell, 2001; Judge et al., 1999; Ng et al., 2005; Seibert & Kraimer, 2001; Turban & Dougherty, 1994). Further, although Agreeableness has traditionally not been advanced as an important predictor of extrinsic success (e.g., Judge et al., 1999), several studies somewhat surprisingly identified a significant negative association (e.g., Judge et al., 1999; Ng et al., 2005; Rode et al., 2008). Based on these findings, we also expect Neuroticism (*Hypothesis 1c*) and Agreeableness (*Hypothesis 1d*) at the beginning of the career to be negatively related to subsequent extrinsic career success.

Finally, Openness to experience has the least consistent association with extrinsic career success. Judge et al. (1999), for instance, found Openness to be positively related to extrinsic career success, but this effect disappeared once the other personality variables were controlled. Conversely, Seibert and Kraimer (2001) identified a significant negative association between Openness and salary level. Given the mixed findings revealed in prior research, no a priori hypothesis

was stated regarding the effects of early career Openness on subsequent extrinsic success in the present study.

Enterprising Interests and Extrinsic Career Success

Although vocational interests have a well-established position in the career development literature, we are unaware of prior studies that looked at their associations with indicators of career success. Nonetheless, there are several compelling arguments to consider vocational interests, and enterprising interests in particular, as potential determinants of career success.

Holland (1985, 1997) described six theoretical vocational interest types (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional), each characterized by specific life goals and values, self-beliefs, problem solving styles, and career preferences. In the context of extrinsic career success, inspection of the type descriptions particularly points out the relevance of having stronger Enterprising interests. Specifically, the Enterprising type is described as having economic and ambitious aspirations; someone who values controlling others, the opportunity to be free of control, and being ambitious. “The Enterprising type aspires to become a leader in commerce, a community leader, influential, and being well dressed” (Holland, 1997, p. 26). Clearly, from a conceptual perspective these enterprising vocational aspirations seem particularly important when the goal is to attain higher levels of extrinsic career success, outcomes that are typically evaluated in terms of financial and/or hierarchical attainment.

In addition, empirical evidence further substantiates the potential relevance of Enterprising interests for extrinsic career success. Chan, Rounds, & Drasgow (2000), for instance, found these interests to be strongly related to a motivation to lead. They specifically found that people high in Enterprising interests like to lead, see themselves as leaders rather than as followers, and will lead others because of a sense of duty and norms. Similarly, Berings, De Fruyt, & Bouwen (2004) found Enterprising interests to be positively associated with work values about influence and earnings.

In sum, by considering vocational interests as additional predictors of career success, we aim at expanding research on individual differences in this domain. As the attainment of financial and/or hierarchical career success most closely corresponds to preferences expressed by the Enterprising type (Holland, 1997), we specifically focus on these interests as an additional person level antecedent of extrinsic career success, beyond the Big Five personality traits. There are strong conceptual as well as empirical indications that Enterprising types are more motivated to manage others or businesses, which may facilitate upward job mobility (Ng, Sorensen, Eby, & Feldman, 2007). At the same time, their economic and extrinsic work values may drive them toward higher financial attainment. For these reasons, we expect these interests, measured at the beginning of the career, to be positively related to extrinsic career success assessed 15 years later (*Hypothesis 2*).

Enterprising Interests as a Mediator of Personality-Success Associations

Despite the rich amount of research on personality-success relations, relatively little is known about *how* personality impacts on career success and on extrinsic career success in particular. Across studies, various explanations are provided for these effects, many of them rather vague and highly speculative. For example, several researchers (e.g., Bozionelos, 2004; Judge et al., 1999; Seibert & Kraimer, 2001) have explained the negative association between Agreeableness and extrinsic career success by referring to the natural tendency of agreeable individuals to downgrade themselves, putting their own *career interests* aside to please their colleagues. However, no empirical evidence for this explanation has been provided to date.

In the present study, we corroborate the idea that career interests play a role in personality-success relations, be it in a different manner than noted above. Specifically, the central idea is that -based on a specific constellation of personality traits- individuals may simply be more or less motivated to attain the traditional extrinsic career goals. There are important theoretical as well as empirical arguments to examine vocational interests, and Enterprising interests

in particular, as a mediator of the relations between personality traits and extrinsic career success.

Holland rather straightforwardly labeled vocational interests as “*expressions of personality*” (Holland, 1997, p. 8) that develop through a complex interaction of biological (i.e. genetic), dispositional, and environmental factors, and that direct individuals’ behavior through motivational processes. Similarly, more contemporary five-factor theory (McCrae & Costa, 2008) considers interests to be the expressions or results (i.e. characteristic adaptations) of the interplay between the stable, cross-cultural, and genetically based FFM personality traits with the individual-specific and culture-specific environments. Importantly, Kandler and colleagues (2011) demonstrated in a genetically informative study that traits and interests are related yet at the same time distinct human attributes that cannot be reduced to one another. Interests are, hence, theoretically best understood as reflecting a kind of intrinsic motivation that -at least partially- springs from basic personality traits and that refers to engaging in an activity because it is desirable and satisfying in itself.

The empirical associations between FFM traits and vocational interests, and Enterprising interests in particular, are widely substantiated (Barrick et al., 2003). We specifically refer to De Fruyt and Mervielde (1997) who reported cross-sectional correlations between Big Five traits and RIASEC interests in the sample of final year college students that is tracked longitudinally for the present study. It was reported that stronger Enterprising interests were associated with higher scores on Extraversion ($r = .48$) and Conscientiousness ($r = .32$), and with lower scores on Neuroticism ($r = -.33$) and Agreeableness ($r = -.23$). These findings can be used to better understand the processes through which personality traits affect career outcomes, and, hence, to formulate specific meditation hypotheses.

Individuals who score higher on Extraversion in general have a greater need to dominate the social environment (Costa & McCrae, 1992), and they also have the interpersonal skills (e.g., sociability, assertiveness, and social dominance) to realize this basic need. In terms of their vocational aspirations, this general personality tendency is expressed through an increased motivation

to lead and manage others professionally (i.e. higher Enterprising interests; De Fruyt & Mervielde, 1997). This striving to dominate the work environment and the associated focus on obtaining status-related rewards can subsequently result in higher financial and/or hierarchical career attainment. Based on this line of reasoning, it is hypothesized that positive effects of Extraversion on future extrinsic career success are -at least partially- mediated through (higher) Enterprising career interests at the beginning of the career (*Hypothesis 3a*).

Individuals higher on Conscientiousness in general are industrious and experience a greater need to pursue high achievement goals across different life domains (Costa & McCrae, 1992). In terms of vocational aspirations, these basic tendencies are expressed in stronger professional ambition, as indicated by stronger Enterprising interests (De Fruyt & Mervielde, 1997). It is therefore hypothesized that positive effects of Conscientiousness on future extrinsic career success are -at least partially- mediated through (higher) Enterprising career interests at the beginning of the career (*Hypothesis 3b*).

Individuals higher on Agreeableness are characterized as soft-hearted, trusting, gullible, compliant, altruistic and modest. In terms of vocational aspirations, these individuals prefer cooperation above competition, and they perceive themselves as followers rather than as leaders, a tendency which is expressed in lower Enterprising interest scores (De Fruyt & Mervielde, 1997). It is, hence, hypothesized that negative effects of Agreeableness on extrinsic career success are -at least partially- mediated through (lower) Enterprising career interests (*Hypothesis 3c*).

Finally, individuals higher on Neuroticism are characterized by higher levels of anxiety, depression, and self-consciousness. Their general lack of self-confidence is also expressed in their vocational aspirations, as illustrated by less pronounced Enterprising interests (De Fruyt & Mervielde, 1997) which draw on forceful, optimistic and resourceful self-perceptions (Holland, 1997). It is, therefore, hypothesized that negative effects of Neuroticism on future extrinsic career success are -at least partially- mediated through (weaker) Enterprising career interests at the beginning of the career (*Hypothesis 3d*).

Finally, potential indirect effects of Openness on extrinsic career outcomes through Enterprising interests will be examined on exploratory grounds.

Method

Design and Participants

To test these hypotheses, data are used from a well-documented longitudinal research project on individual differences, labor market entrance, and career unfolding in a Flemish college alumni sample with measurement occasions in 1994, 1995, 2009 and 2010 (De Fruyt, 2002; De Fruyt & Mervielde, 1999; Wille et al., 2010, 2012). In 1994 (Time 1; T1), 934 college students from various disciplines enrolled in this research program by filling out extensive questionnaires three months prior to graduation. For the purpose of the present study, personality and vocational interest data gathered at T1 are used in combination with indicators of extrinsic career success measured 15 years later in 2009 (Time T2; T2). Specifically, data are used from 192 full-time employed participants who -in addition to their personality and interest measures at T1- reported on extrinsic career success at T2. Independent-samples t-tests revealed no significant mean differences between dropouts ($N = 742$) and continuers ($N = 192$) in terms of T1 personality and enterprising interest scores.

The participants included in this study were 115 (59.9%) men and 77 (40.1%) women with a mean age of 37.39 years ($SD = 1.31$) at T2. They represented various college and university faculties, including Philosophy, History and Languages ($N = 47$), Law ($N = 32$), Industrial engineering ($N = 21$), Sciences ($N = 17$), Applied sciences ($N = 26$), Economics ($N = 14$), Psychology and Educational sciences ($N = 16$), Applied biological sciences ($N = 6$), and Political and Social sciences ($N = 13$). The average number of working hours per week was 43.35 ($SD = 8.92$).

Measures

Personality. Big Five personality traits were assessed at T1 using the Dutch authorized adaptation of the NEO PI-R (Costa & McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996). The Dutch Revised NEO Inventory is a

faithful translation of the NEO PI-R, with a factor structure and psychometric properties closely resembling the normative US Inventory (De Fruyt & Mervielde, 1997).

Enterprising interests. The Enterprising interest scale of the Dutch authorized adaptation (BZO95; Hogerheijde, Van Amstel, De Fruyt, & Mervielde, 1995) of the Self-Directed Search (SDS; Holland, 1979) was used to assess Enterprising interests at T1. The BZO is a broad measure of vocational interests, and includes items referring to activities one likes to do, competencies a person has, occupations one prefers, and characteristic personality features. To avoid the issue of criterion contamination (Costa, McCrae, & Holland, 1984), items referring to personality descriptors were excluded when computing composite Enterprising interest scores (De Fruyt & Mervielde, 1997).

Career success. At T2, two indicators of extrinsic career success were assessed that are commonly used in research addressing the dispositional nature of career outcomes: income and managerial level. To assess participants' *management level*, they were asked to rate their current occupations at T2 against five managerial levels: "under managerial level", coded as 0; "lower management", coded as 1; "middle management", coded as 2; "top management in a small organization", coded as 3; and "top management in a large organization", coded as 4. In addition, *income* or monthly salary before taxes was measured by asking participants to indicate the appropriate wage category going from 1 "less than € 1.000"; 2 "less than € 2.000" to 16 "more than € 15.000". Consistent with standard practice in wage regressions (e.g., Kerr & Kren, 1992) and following the guidelines by Cohen, Cohen, West and Aiken (2003), earnings were log-transformed which resulted in a measure closer to the normal distribution (Log Income, *Skewness* = -.03 and *Kurtosis* = 2.66). Based on distribution statistics, it was decided that no transformation was necessary for management level (*Skewness* = .30; *Kurtosis* = -1.06).

Control variables. The effects of Big Five traits and Enterprising interests on career success were examined when controlling for the effects of gender and college subject major. Gender was accounted for given that prior studies have identified significant differences between men and women in

personality traits (Schmitt, Realo, Voracek, & Allik, 2008), vocational interests (Darley & Hagenah, 1955; Hansen & Campbell, 1985; Strong, 1943) as well as in extrinsic career success (e.g., Ng et al., 2005). College subject major was controlled for as this could be associated with mere sector effects on career outcomes, like remuneration. For this purpose, participants were classified into one of three categories regarding educational background: *Alpha sciences* (Philosophy, History and Languages; $N = 47$), *Beta sciences* (Industrial engineering, Sciences, Applied sciences, and Applied Biological sciences; $N = 70$) and *Gamma sciences* (Law, Economics, Psychology and Educational sciences, Political and Social sciences; $N = 75$).

Results

Table 1 contains descriptive statistics, reliabilities and intercorrelations among the study variables. Gender differences were found for three of the Big Five personality traits, with women scoring significantly higher on Neuroticism ($d = -.50, p < .01$), Openness ($d = -.43, p < .01$), and Agreeableness ($d = -.36, p < .05$). Conversely, higher scores on Enterprising interests were found for men ($d = .32, p < .05$), and men also reported higher management and salary levels ($d = .40, p < .01$ and $d = .55, p < .001$ respectively). Enterprising interests correlated significantly with four of the five personality traits, showing positive associations with Extraversion ($r = .43, p < .001$) and Conscientiousness ($r = .26, p < .001$), and negative relations with Neuroticism ($r = -.24, p < .01$) and Agreeableness ($r = -.18, p < .05$). The results in Table 1 further indicate that extrinsic career success had several significant bivariate associations with traits and interests assessed at the beginning of the career. Finally, both indicators of extrinsic career success showed to be moderately related ($r = .30, p < .001$).

We also examined the associations between college subject major and personality traits, interests and extrinsic career success using a one-way ANOVA design to compare alumni scores from alpha, beta and gamma sciences. The omnibus test revealed significant differences between the three groups in Openness scores, $F(2,189) = 8.08, p < .001$, and in income levels $F(2,189) = 6.03, p < .01$. Post-hoc comparisons (LSD) further showed that

participants from gamma sciences scored significantly higher on Openness compared to individuals from alpha ($d = .77, p < .001$) and beta ($d = .41, p < .05$) sciences. Conversely, alumni from gamma sciences reported significant lower income levels compared to participants from beta sciences ($d = -.53, p < .01$).

A series of two hierarchical regression analyses were subsequently performed to further examine the effects of early career personality traits and vocational interests on each of both success criteria, after controlling for gender and college subject major (Table 2). For management level, adding Big Five traits to the prediction model (Step 2) resulted in a modest but significant increase in explained variance ($\Delta R^2 = .04, p < .05$), and Extraversion emerged as the only significant predictor ($\beta = .18, p < .05$). In Step 3, Enterprising interests revealed to be an additional predictor of management level ($\Delta R^2 = .03, p < .05$), resulting in a model that eventually explained over ten percent of the variance in hierarchical success ($R^2 = .12, p < .01$). For income level, adding Big Five traits to the prediction model (Step 2) resulted in a significant and substantial gain in explained variance ($\Delta R^2 = .14, p < .001$), and indicated Extraversion ($\beta = .16, p < .05$), Agreeableness ($\beta = -.21, p < .01$) and Conscientiousness ($\beta = .20, p < .01$) as significant trait level predictors. Moreover, Enterprising interests again revealed to be an additional predictor of career success (Step 3; $\Delta R^2 = .04, p < .01$), resulting in a model that ultimately explained almost thirty percent of the variance in financial success ($R^2 = .29, p < .001$).

According to Baron and Kenny (1986), four conditions have to be fulfilled to establish mediation: (a) the independent and mediating variables must be significantly related; (b) the independent and dependent variables must be significantly related; (c) the mediator and dependent variables must be significantly related; and (d) the relationship between the independent variable and the dependent variable should be nonsignificant or weaker when the mediator is added. The last column of Table 2 shows the associations between Big Five personality traits (independent variables) and individuals' Enterprising scores (mediator), supporting condition 1 for mediation. Specifically, Enterprising interests were positively associated with Extraversion ($\beta = .39, p <$

.001) and Conscientiousness ($\beta = .20, p < .01$), and negatively with Agreeableness ($\beta = -.25, p < .001$). The associations between personality traits and success, and between Enterprising interests and success were discussed above and partially supported conditions 2 and 3 for mediation. Finally, parameter estimates in Step 3 of the hierarchical regressions also provided evidence for the fourth condition outlined by Baron and Kenny (1986). After Enterprising interests were taken into account, the effect of Extraversion on management level became nonsignificant ($\beta = .10, p > .05$) which suggests complete mediation. With regard to income, we also found that adding Enterprising interests to the prediction model caused the effect of Extraversion to become nonsignificant ($\beta = .07, p > .05$) and moreover weakened the effects of Agreeableness (from $\beta = -.21, p < .01$ to $\beta = -.15, p < .05$) and Conscientiousness (from $\beta = .20, p < .01$ to $\beta = .15, p < .05$), indicating partial mediation. To further assess the significance of the mediation, we applied Sobel's (1982) test for indirect effects (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Results showed that the intervening effect of Enterprising interests in the relation between Extraversion and management level was significant ($p < .05$). Similarly, significant mediating effects of Enterprising interests were found in the relations between income and Extraversion ($p < .01$), Agreeableness ($p < .05$) and Conscientiousness ($p < .05$).

Discussion

The longitudinal study presented here re-addressed the dispositional nature of extrinsic career success in a diverse sample of college alumni, spanning a time interval of 15 years. Although dropout was substantial, the remaining sample was still highly heterogeneous in terms of educational specialty while at the same time homogeneous with regard to the level of education. This allowed us to test whether variation in specific vocational interests is useful in illuminating the road to hierarchical and/or financial success.

The first objective of this study consisted of replicating trait-success associations in a non-American context and using a prospective longitudinal

research design. The results matched reasonably well with our expectations based on previously reported results (e.g., Judge et al., 1999). Extraversion and Conscientiousness were significant positive predictors of future career success, although the effect of the latter was restrained to financial success attainment. Similarly, the hypothesized negative effect of Agreeableness on extrinsic success was only confirmed for income. Our findings most strongly diverged from our expectations with respect to the effects of Neuroticism on extrinsic success. Although we indeed found a significant correlation between Neuroticism and income, this effect faded away in the regression analysis. Moreover, no significant association whatsoever was found between Neuroticism and management level.

As argued in the introduction, it is important to replicate cross-sectional findings using longitudinal research designs that allow for stronger inferences about the direction of effects. We specifically noted that such designs are warranted, also in the domain of trait-success associations, given the increasing evidence that traits continue to develop during adulthood, and that the establishment of a successful career seems a key mechanism herein (i.e. the Social Investment Principle; Roberts, Wood, & Smith, 2005). Sutin and colleagues (2009) for instance demonstrated that personality and the attainment of financial success are reciprocally related. They specifically showed that earning higher incomes predicts decrease in Neuroticism. Those who earn more money show decreases in their susceptibility to anger and proneness to depression, while not having sufficient means to provide for personal needs may produce a great deal of stress and feelings of worthlessness (Sutin et al., 2009). The present study is the first to prospectively examine the validity of Big Five personality traits, measured at the career start, to predict extrinsic career outcomes in the same cohort 15 years later when their careers had unfolded. The fact that we failed to find any convincing prospective effects of Neuroticism on future extrinsic success may highlight the issue of reciprocity and stipulates the importance of longitudinal research designs.

As a second main research objective, we introduced Enterprising interests as an additional person level antecedent of extrinsic career success. Despite their

prominent position in the career literature, vocational interests have remained conspicuously absent in the literature on career success. Nonetheless, we argued that they are relevant in this context as they have been shown to play an important role in guiding our vocational choices through preferred activities and leading life goals. Referring to the associated economic values and leadership aspirations, we specifically hypothesized that Enterprising interests in particular would add to our understanding of financial and/or hierarchical attainment. Our results indeed showed that these vocational aspirations prospectively predicted both indicators of career success assessed 15 years later. Moreover, Enterprising interests demonstrated incremental validity in predicting these outcomes over and above Big Five traits, which further substantiates the idea that traits and interests are not just alternative measures of the same construct but that they can uniquely contribute to the understanding of human (vocational) behavior.

Besides examining the main effect of interests on career success, an important final objective of this study was to examine the validity of Enterprising interests as a mediating mechanism in personality-success relations. Our results showed that Extraversion, Agreeableness, and Conscientiousness were related to Enterprising interests, and that Enterprising interests subsequently interfered in the relations between these traits and both indicators of career success. We first found that Enterprising interests fully mediated the effects of Extraversion on management level and income, providing evidence for the idea that extraverts' higher hierarchical and financial attainment is largely driven by aspirations about dominating the work environment and an urge for status-related rewards (e.g., Bozionelos, 2004). Further, individuals higher on Conscientiousness are characterized by stronger achievement striving and goal persistence; ambitious characteristics that nourish Enterprising career aspirations and, eventually, translate into in higher financial career success.

Interestingly, Enterprising interests also (partially) mediated the effects of Agreeableness on financial success. In the early work on personality-success relations, Agreeableness was typically not a priori hypothesized to be a relevant predictor of career success (e.g., Judge et al., 1999), mainly because of the unclear associations between this trait and job performance. As studies

repeatedly *did* identify negative associations between Agreeableness and extrinsic career success, researchers developed an alternative explanation by referring to the tendency of agreeable people to help and care about others and therefore putting their own career interests aside (e.g., Bozionelos, 2004; Seibert & Kraimer, 2001). The results of the present study, however, cautiously paint another picture and suggest that highly agreeable people rather do not share the same career interests as individuals scoring lower on this trait, and in particular differ in those interests that are beneficial for obtaining financial and/or hierarchical career success. We believe this alternative explanation is not only important theoretically, but also on a practical level. Bozionelos (2004), for example, argued that studies on the dispositional nature of work outcomes are useful with regard to personal development and career advice. Although we agree that it is important for people to be aware of their strengths and weaknesses in professional contexts, we would however be more careful in describing certain personality profiles, like a high score on Agreeableness, as a *limiting* factor in attaining career success. Our results suggest that an individual's lower level of extrinsic career success is not something that is simply *imposed* by his or her personality characteristics, but that this is -to a certain extent- compatible with his or her specific vocational preferences. In the case of Agreeableness, our results showed that individuals scoring high on this trait expressed a weaker desire for higher extrinsically rewarded vocational positions compared to low scorers. Note that in our research design, vocational interests were assessed at the *beginning* of the career so they do not reflect a retrospective evaluation of one's achieved professional accomplishments (e.g., the case of someone downsizing the desirability of financial success because of earlier failure in trying to achieve it).

Limitations

Several limitations with this study should also be noted. A first potential criticism is that we used self-reports to measure extrinsic career success. However, although self-report data are prone to a number of distortions, it has also been noted (Podsakoff & Organ, 1986) that information that is factual,

likely to be in the possession of the respondent, and at least in principle verifiable, is less likely to suffer from such problems. Judge et al. (1995), for example, reported that in a large sample of executives the difference between self- and archival reports of salary was only 1%. In addition, there was no external motivation for participants in the present study to provide inaccurate responses to these questions, which were embedded in a wider alumni follow-up survey. A second limitation is that we could not control for general mental ability (GMA) in our analyses. As both personality traits and vocational interests have been shown to relate to intelligence (Ackerman & Heggestad, 1997), the effects of these individual differences on career success could be partially confounded by GMA (e.g., Judge et al., 1999). However, the fact that all participants in this study succeeded higher education indicates a certain level of homogeneity with regard to their intellectual abilities. Finally, it has to be noted that the effects of Agreeableness and Conscientiousness on extrinsic career success were only partially mediated by Enterprising interests, which suggests that other mechanisms also play a role in trait-success associations. We therefore encourage future researchers to propose and test additional mechanisms that further help to clarify the road to success.

Conclusion

It is an attractive idea that, in a fair world, high performance is proportionally rewarded and therefore a primary source of professional ascendancy and gain in salary. Nonetheless, empirical research suggests that work performance is only weakly associated with career success (Cannings, 1988; Jaskolka et al., 1985), and the association between traits and performance itself is far from understood and may vary across occupations. The present study demonstrated that the inclusion of an extra motivational construct, such as people's Enterprising interests, can significantly add to our understanding of hierarchical and financial success attainment. Furthermore, in accordance with Holland's conceptualization of interests as expressions of personality, we provided evidence for an intervening effect of Enterprising interests in personality-success relations, offering an alternative perspective on the

underlying nature of these associations. This perspective acknowledges that not everyone is to the same extent interested in achieving financial and/or hierarchical success, and that this is at least partly an expression of personality.

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Tables

Table 1

Means, standard deviations, intercorrelations, and reliabilities

Variable	<i>M</i> ^a	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Gender	-	-	-								
2. Neuroticism	2.81	0.42	.24**	(.91)							
3. Extraversion	3.31	0.43	.01	-.31 [†]	(.91)						
4. Openness	3.57	0.36	.21**	.19*	.17*	(.86)					
5. Agreeableness	3.45	0.40	.17*	-.18*	.13	.17*	(.91)				
6. Conscientiousness	3.49	0.38	.03	-.32 [†]	.19**	-.12	.08	(.90)			
7. Enterprising interests	19.31	8.29	-.15*	-.24**	.43 [†]	.03	-.18*	.26 [†]	(.91)		
8. Management level	1.23	1.14	-.19**	-.04	.15*	-.08	-.09	.05	.24**	-	
9. Log income	1.53	0.35	-.26 [†]	-.23**	.18*	-.18*	-.19*	.25 [†]	.33 [†]	.30 [†]	-

Note. Gender was coded 0 for men and 1 for women. Where appropriate, coefficient alpha is on the diagonal. ^aPersonality mean scores are computed on a scale from 1 to 5. * $p < .05$; ** $p < .01$; [†] $p < .001$.

Table 2

Hierarchical regression analyses with Big Five traits predicting career success

Variable	Management level			Log income			Enterprising interests
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	
Gender	-.16*	-.15	-.13	-.25**	-.18*	-.15*	-.12
Dummy 1	-.02	-.03	-.05	-.17*	-.19*	-.21**	.11
Dummy 2	-.14	-.14	-.17*	-.23**	-.24**	-.28***	.14
Neuroticism		.06	.05		-.11	-.09	-.08
Extraversion		.18*	.10		.16*	.07	.39***
Openness		-.04	-.05		-.07	-.09	.06
Agreeableness		-.09	-.04		-.21**	-.15*	-.25***
Conscientiousness		.03	-.01		.20**	.15*	.20**
Enterprising interests			.21*			.23**	
ΔR^2	.05*	.04*	.03*	.12***	.14***	.04**	.33***
R^2	.05*	.09*	.12**	.12***	.26***	.29***	.33***

Note. College subject major was recoded using two dummy variables. * $p < .05$; ** $p < .01$; *** $p < .001$.

Chapter 2

Big Five traits and intrinsic success in the new career era: A 15 year longitudinal study on employability and work- family conflict¹

Abstract

The present investigation contributes to research on the dispositional source of intrinsic (subjective) career success in three general ways. First, two indicators of career success were considered, i.e. perceived employability and work-family conflict, which closely align with the characteristics of contemporary boundaryless careers. Second, facet level associations were examined, providing a more fine grained description of personality-success relations. Third, besides concurrent associations, we also examined the prospective effects of traits on career success assessed 15 years later. Overall, our results further substantiated an individual difference perspective on career success, with both outcomes being significantly and substantially predicted by Big Five traits, even when controlling for a number of demographic and career related characteristics. Further, results indicated that facet level analyses can contribute significantly to our theoretical understanding of trait-success associations. Finally, a comparison of concurrent and longitudinal analyses indicated temporal stability of personality-success relations, although the predictive validity of separate traits was also found to vary across time.

¹ Wille, B., De Fruyt, F., & Feys, M. (in press). Big Five traits and intrinsic success in the new career era: A 15 year longitudinal study on employability and work-family conflict. *Applied psychology: An International Review*, 62, 124-156.

Introduction

Over the past decades, considerable research attention has been devoted to the antecedents of career success (e.g., Boudreau & Boswell, 2001; Judge, Higgins, Thoresen, & Barrick, 1999; Seibert & Kraimer, 2001; Stumpp, Muck, Hulsheger, Judge, & Maier, 2010). While initial studies mainly focused on human capital attributes and demographic factors, more recent work also addressed the dispositional nature of career outcomes, with personality traits receiving a great deal of attention given their effects on related domains of organizational behavior such as job performance (e.g., Barrick & Mount, 1991) and job satisfaction (e.g., Judge, Locke, Durham, & Kluger, 1998). To date, research has convincingly demonstrated the validity of traits to predict traditional indicators of success, such as career satisfaction and occupational or financial attainment (Judge et al., 1999; Seibert & Kraimer, 2001).

The aim of this study is to contribute to research on the dispositional source of career success in three general ways. First, we want to expand this line of research by considering an additional set of two success criteria that closely align with recent developments in the career landscape. We specifically argue that employability and work-family conflict are important and relevant work outcomes in contemporary careers, and, hence, can be incorporated in studies examining the dispositional source of career success. As a second contribution, we aim at further developing our theoretical knowledge on dispositional effects on career outcomes by considering more fine grained personality facet information in our predictive models. These can shed light on contrary hypotheses and findings from previous studies that considered only broad personality domains. Finally, the present study draws on a unique research design that allows studying personality-success relationships concurrently as well as longitudinally, providing fundamental insights into the predictive validity of traits over a substantial and vital time interval, namely the first 15 years of the professional career.

Career Success in the New Career Era

Career success has been defined in terms of the positive psychological and work-related outcomes accumulated as a result of one's work experiences (Judge, Cable, Boudreau, & Bretz, 1995). Although career researchers have traditionally focused on objective or extrinsic indicators of success (e.g., attained organizational position and salary level), interest has increased in alternative, subjective outcomes over the past years to obtain a more comprehensive understanding of career success (e.g., Judge et al., 1995; Ng, Eby, Sorensen, & Feldman, 2005; Seibert & Kraimer, 2001). Subjective or intrinsic career success is broadly defined as "*an individuals' reactions to his or her unfolding career experiences*" (Heslin, 2005, p. 114). It has been argued that—in a context of boundaryless careers—the subjective interpretation of one's career status, rather than objective position, can be considered as the major indicator of career success (Heslin, 2005).

As a result, intrinsic success has increasingly been adopted within career success research over the past decade (Greenhaus, 2003; Hall, 2002), and has most commonly been operationalized as either job or career satisfaction (Heslin, 2005). Following Heslin's (2005) recommendation, the present study attempts to broaden the conceptualization of intrinsic career success in order to include reactions to actual and anticipated career-related events across a wider range of outcomes. Specifically, we aim at contributing to the conceptualization and measurement of subjective career success by considering those criteria that reflect "*what employees want*" (Heslin, 2005, p. 117). Hereby, two important factors emerge. First, inspection of the top 10 satisfaction factors outlined in the SHRM Employee Job Satisfaction and Engagement Research Report (2011) reveals that the main thing that U.S. employees want at the moment is *employment security*. Clearly, individuals' perceptions of being marketable by current or future employers constitute an important aspect of their current career evaluations. A second career outcome that reflects what employees today find important connects to changes in workforce attitudes toward work. Specifically, research on generational differences in work values indicates an increased desire to balance work goals and personal goals (Smola & Sutton, 2002). Finegold and

Mohrman (2001), for instance, found that among 4,500 knowledge workers and managers from eight countries, *work-life balance* was rated as the most important out of the many facets of a career.

In an attempt to broaden the conceptualization of subjective career success, hereby drawing on research on what is particularly important for employees today across nations, the present study focuses on *perceived employability* and *work-family balance* as indicators of intrinsic career success. In the paragraphs below, these constructs are described more elaborately and it is argued that both these subjective career evaluations are particularly relevant in the context of contemporary boundaryless careers.

Employability and Work-Family Conflict in the New Career Era

Career researchers have argued that career success should be studied in the context of “the new career era”, which refers to the extensive writing on the changing career environment (e.g., De Vos & Soens, 2008; Eby, Butts, & Lockwood, 2003). The present study responds to this call by considering two subjective career outcomes that closely align with characteristics of contemporary careers.

First, global trade competition, the fast pace of technological innovation, and government deregulation of industry have led to widespread corporate layoffs, workplace restructuring, and the increasing use of a contingent workforce (Hirsch & De Soucey, 2006; König, Probst, Staffen, & Graso, 2011). Along with these economic realities, career researchers have identified a transition from relatively stable organizational career paths to so-called boundaryless careers (Arthur, 1994). Individuals can no longer expect lifetime employment within one organization or steady hierarchical career paths. Instead, individuals are increasingly confronted with the possibility of involuntary job loss, lateral job movement within or across organizational boundaries, and career interruptions (Arthur & Rousseau, 1996). Accompanying these changing career perspectives, there is also a shift in accountability for career development from employers to employees, who are considered responsible for acquiring knowledge, skills, abilities, and other characteristics valued by current and

prospective employers (Fugate & Kinicki, 2008; Van der Heijde & Van der Heijden, 2006). With jobs and career paths being less long term and stable, individuals who are successful are now those who are able to remain value-added to their present employer (e.g., through learning and/or training) and who are viewed as marketable by other organizations (Bird, 1994; Eby et al., 2003; Rothwell & Arnold, 2007; Sullivan, Carden, & Martin, 1998). Hence, it has been argued that *employability* can and should be regarded as an important factor in understanding career success in the contemporary career era (Bird, 1994; De Vos, De Hauw, & Van der Heijden, 2011; Eby et al., 2003; Hall, 2002; Sullivan et al., 1998), and individuals' perceptions of their marketability in particular have already been studied as an indicator of intrinsic career success in addition to the more traditional career satisfaction measures (e.g., De Vos & Soens, 2008; Eby et al., 2003). Employability is a broad term and can be studied from different perspectives (e.g., contextual vs. individual) and at distinct levels (individual, organizational, and industrial) (Van der Heijde & Van der Heijden, 2006). In this study, we consider employability as an indicator of success in unstable contemporary careers, and therefore focus on individuals' evaluations of their marketability as reflected in their perceived ability to find another job (see also De Vos & Soens, 2008; Eby et al., 2003).

In addition to this reality of unstable and unpredictable careers, another far-reaching development in modern career landscape has been described. Specifically, changing demographics and increased competition are afflicting work and family roles. Employees are working longer hours and are increasingly confronted with higher workloads (e.g., Galinsky, Bond, & Hill, 2002; Kodz et al., 2003). Women are participating in the labor market at an increasing rate, many have children and some are single parents (Paulin & Lee, 2002). The growing number of dual-earner couples can profit from bolstered family incomes, but are at the same time confronted with challenging dual responsibilities in work and families. It is in this context that the topic of balancing work and private life has gained increasing interest among scholars, and studies in American (e.g., Eagle, Miles, & Icenogle, 1997) as well as European (e.g., Geurts, Kompier, Roxburgh, & Houtman, 2003) populations

indicate that a substantial proportion of employed parents experience *work-family conflict* at least some of the time. Furthermore, cross-sectional and longitudinal research has also provided consistent evidence that work-family conflict is associated with various negative outcomes like the experience of stress, physical and mental health problems, job exhaustion and intentions to leave an organization (Allen, Herts, Bruck, & Sutton, 2000; Frone, 2000; Frone, Russell, & Cooper, 1997; Kelloway, Gottlieb, & Barham, 1999; Kinnunen, Vermulst, Gerris, & Mäkikangas, 2003). As denoted by Judge and Kammeyer-Mueller (2007) and Heslin (2005), the extent to which individuals perceive a negative interference from the work role to the family role can therefore be considered as a valuable indicator of intrinsic success in contemporary careers.

Work-family conflict is commonly defined as “*a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect*” (Greenhaus & Beutell, 1985, p. 77). These role pressures are directional and produce negative effects from one domain to the other (Frone, Russell, & Cooper, 1992), and researchers and theorists have recently focused on the degree to which participation in the family role is hindered by participation in the work role—termed work-to-family conflict (WFC), and the degree to which participation in the work role is impeded by participation in the family role—termed family-to-work conflict (FWC). Empirical support for the distinction between both forms of role conflict comes from several sources, including differential outcomes (e.g., Mesmer-Magnus & Viswesvaran, 2005) and antecedents (e.g., Byron, 2005). Since the focus of the present study is on employees’ *career* success, it is restrained to an examination of work-to-family conflict, which has been shown to originate mainly in the work domain as opposed to the family domain (see Byron, 2005).

Personality Theory

Personality theory provides a valuable framework for understanding and hypothesizing associations between traits and experiences in various life domains, including vocational life (Hogan, 1991). It specifically proposes that a dynamic organization of mental structures and coordinated mental processes

determines individuals' *emotional* and *behavioral* adjustments to their environments (i.e., characteristic patterns of behavior, thoughts, and feelings; Allport, 1937, 1961; James & Mazerolle, 2000). Further, this theory states that there are recurring regularities or trends in a person's psychological features—attitudes, emotions, and ways of perceiving and thinking— that exist inside a person that explain the recurring tendencies in an individual's behavior (Hogan, 1991). As such, a central presumption of personality theory is that an individual possesses a predisposition to behave, think, and feel in a relatively consistent manner over time and across diverse situations. This relative cross-situational consistency is captured by the term “personality trait”.

Over the past decades, the Five-Factor Model of personality (FFM; McCrae & Costa, 1987) has evolved to a frequently examined typology of personality in the field of organizational behavior (e.g., Barrick & Mount, 1991; Costa, 1996; Judge, Heller, & Klinger, 2008; Templer, 2011). The FFM includes the traits of Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness, and each of these traits have previously been related to traditional indicators of extrinsic and/or intrinsic career success (for an overview, see for example Judge & Kammeyer-Mueller, 2007).

In accordance with personality theory, linkages between Big Five traits and subjective success in contemporary careers can be expected because these dispositions influence (a) specific behavioral patterns relevant for these outcomes (e.g., coping strategies, resource acquisition, work orientation), as well as (b) perceptions about, or experience of, strain associated with engagement in the work role. Specific hypotheses regarding the associations between Big Five traits and perceived employability and work-family conflict are discussed in greater detail below.

Big Five Traits and Perceived Employability

Although we are not aware of prior studies that investigated the associations between perceived employability and the FFM, specific expectations can be formulated for each of the Big Five drawing on trait descriptions and insights from personality theory. First, traits like Neuroticism

and Extraversion can be related to subjective work outcomes because of their direct effects on evaluative processes. Individuals high on *Neuroticism* are characterized by an enduring tendency to experience negative emotional states and to interpret situations in a pessimistic way (Costa & McCrae, 1992). Studies investigating the relationships between Neuroticism and job satisfaction, for example, have consistently found a negative correlation (Judge et al., 1998). In this regard, high levels of anxiety and low self-esteem may also nourish discouraged marketability perceptions, and we therefore predict a negative relationship between Neuroticism and perceived employability (*Hypothesis 1a*).

Whereas theory and evidence suggest a negative relationship between Neuroticism and intrinsic career success, the opposite is true with respect to *Extraversion*. Extraverts generally hold more positive evaluations to life in general and to their careers in specific (Furnham & Zacherl, 1986; McCrae & Costa, 1991), and research has indeed shown positive associations between Extraversion and indicators of intrinsic career success like job and career satisfaction (Judge et al., 1999; Judge et al., 1998). In addition to this ‘positivity bias’, individuals high on Extraversion are characterized as active and assertive, and they are therefore likely to take actions to deal with unsatisfactory career situations (Seibert & Kraimer, 2001), such as low employability perceptions. For these reasons, we expect a positive association between Extraversion and perceived employability (*Hypothesis 1b*).

Conscientiousness and Openness to experience can be expected to influence career success mainly through relevant work behaviors. Specifically, these traits have been related to engagement in learning and development activities at work, which could in turn affect employability perceptions. Those scoring high on *Conscientiousness* have a constant striving for success and express a tendency to set challenging goals and to do what it takes to succeed (Barrick, Mount, & Strauss, 1993). These qualities make high conscientious individuals more likely to invest in training and learning efforts and to perceive the need for and value of expanding one’s capabilities (Maurer, Lippstreu, & Judge, 2008). From the perspective that training history is an important component of employability (Forrier & Sels, 2003), we can therefore expect

Conscientiousness to be positively related to perceived employability (*Hypothesis 1c*).

Similarly, Barrick and Mount (1991) note that *Openness to experience* includes characteristics such as being curious, broad-minded and intelligent, and they demonstrated that this trait is linked to work-related behavior, including success in training/learning settings and favorable attitudes toward learning. In a reality of less stable employment and a need to constantly be on the lookout for ways to build new skill sets, Openness can therefore also be expected to be positively related to perceived employability (*Hypothesis 1d*).

Finally, it has been shown that traits affecting interpersonal behavior could facilitate networking activities, both internal and external (e.g., Wolff & Muck, 2009). *Agreeableness* is associated with characteristics as being cooperative, compliant, trusting, kind and warm (Judge & Ilies, 2002), and this trait particularly predicts prosocial interpersonal behavior (Costa & McCrae, 1992). Under the assumption that the availability of a wide professional network can enhance marketability perceptions, we also expect *Agreeableness* to be positively associated with perceived employability (*Hypothesis 1e*).

Big Five Traits and Work-Family Conflict

Although researchers have started to examine the role of specific dispositional factors, like trait affectivity (e.g., Stoeva, Chiu, & Greenhaus, 2002), self-evaluations (e.g., Boyar & Mosley, 2007; Noor, 2002), or isolated personality traits (e.g., Grzywacz & Marks, 2000) to predict work-family conflict, studies considering a comprehensive personality framework (e.g., The FFM) for this purpose are scarce (e.g., Michel, Clark, & Jaramillo, 2011; Michel, Kotrba, Mitchelson, Clark, & Baltes, 2011). Furthermore, it has been argued that much of the research on work-family conflict is cross-sectional and that longitudinal studies addressing the topic are severely lacking (Boyar & Mosley, 2007; Bruck & Allen, 2003; Michel et al., 2011). As for perceived employability and drawing on personality theory, expectations regarding personality effects on work-family conflict can be formulated based on their consistent influence on behavioral patterns and general evaluative tendencies.

Empirical research has consistently found a strong positive relationship between *Neuroticism* and trait Negative Affect (Watson & Clark, 1992), which facilitates withdrawal motivation (e.g., apprehensiveness and cautiousness; Watson, Wiese, Vidya, & Tellegen, 1999). When faced with conflicting demands from work and nonwork roles, this withdrawal approach suggests that individuals high on Neuroticism seek fewer solutions to help manage demands from multiple domains (Michel et al., 2011). Indeed, research has found a negative association between Neuroticism and the use of effective coping strategies (Watson & Pennebaker, 1989). In addition to these associations with behavioral responses, Neuroticism influences emotional reactions to the experience of strain. Research has shown that individuals high in Neuroticism have a heightened responsiveness to negative stimuli, causing them to generally experience more job and family stress (Zellars & Perrewe, 2001). This, in turn, increases the degree of conflict experienced (Stoeva et al., 2002). For these reasons and consistent with previous research (Bruck & Allen, 2003; Michel et al., 2011; Wayne, Musisca, & Fleeson, 2004), Neuroticism is expected to be positively related to perceived work-family conflict (*Hypothesis 2a*).

Contrary to Neuroticism, *Extraversion* has been found to relate strongly and positively to trait Positive Affect (PA; Watson & Clark, 1992), and it has been posited that this positive emotionality facilitates an approach motivation (e.g., goal-directed behavior; Watson et al., 1999). In the context of negative work-nonwork spillover, this means that those high in Extraversion (and PA) would seek out more proactive solutions to help manage competing demands from various roles (Michel et al., 2011). This is supported by research showing that these individuals have increased life satisfaction because they actively develop resources for living well (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009). In addition, due to their more positive nature individuals high on Extraversion have been found to perceive fewer life stressors (Michel & Clark, 2009; Stoeva et al., 2002). For these reasons and consistent with previous research (Grzywacz & Marks, 2000; Michel et al., 2011; Wayne et al., 2004), Extraversion is expected to be negatively related to perceived work-family conflict (*Hypothesis 2b*).

With regard to the effects of *Conscientiousness*, it has previously been suggested that characteristics like being purposeful, punctual and organized are supposed to make individuals more effective at managing their time, tasks, and conflicts that arise between work and home domains (Bruck & Allen, 2003; Wayne et al., 2004). Indeed, Conscientiousness has been linked with effective problem solving behaviors, support seeking, and cognitive restructuring coping behaviors (Connor-Smith & Flachsbart, 2007), which could help individuals reduce negative work-nonwork spillover (Michel et al., 2011). This is further supported by research demonstrating that more conscientious individuals experience less detrimental effects from work role ambiguity (Miller, Griffin, & Hart, 1999), the latter being an established antecedent of work-to-family conflict (Michel et al., 2011). On these grounds and consistent with previous research (Bruck & Allen, 2003; Michel et al., 2011; Wayne et al., 2004), Conscientiousness is expected to be negatively related to work-family conflict (*Hypothesis 2c*).

It has previously been argued that, because of their affiliative nature, individuals high in *Agreeableness* should be more likely to build a support network, which they can rely on when coping with work and nonwork demands (Michel et al., 2011; Wayne et al., 2004). Evidence therefore is provided from various lines of research. First, characteristics associated with Agreeableness, such as kindness, sympathy and trust, have been shown to enhance the likelihood of emotional support from coworkers (Zellars & Perrewe, 2001), and absence of support has been named as one of the factors contributing to work-family conflict (Greenhaus & Beutell, 1985). Further, Connor-Smith and Flachsbart (2007) found that Agreeableness was indeed positively related to support seeking coping behaviors. For these reasons and consistent with previous research (e.g., Michel et al., 2011; Wayne et al., 2004) we expect a negative association between Agreeableness and work-family conflict (*Hypothesis 2d*).

Finally, for *Openness to experience* it has been argued that characteristics as imagination and originality should be associated with a tendency to come up with creative solutions when conflict arises, thus, resulting in less work-family

conflict (Michel et al., 2011; Wayne et al., 2004). However, as prior research generally failed to find significant associations between Openness and aspects of work-family conflict (Bruck & Allen, 2003; Wayne et al., 2004), we opt not to formulate any specific hypotheses. Openness is nevertheless included in our analyses for exploratory reasons and because we want to examine the validity of the entire Big Five personality framework.

Facet Level Associations

The Big Five factors are structured in terms of a hierarchy, with five higher order personality factors (domains) aggregating a number of heterogeneous lower level traits (facets) (Costa & McCrae, 1992). In terms of criterion validity, there is disagreement concerning the relative usefulness of the Big Five factors and the more specific lower level traits to predict real-life criteria (i.e. the ‘bandwidth-fidelity dilemma’, see for instance Ones & Viswesvaran, 1996). However, from a theoretical perspective it has been argued that the more narrow personality variables are, the greater the conceptual clarity and interpretability of empirical results due to greater homogeneity in the construct being tapped into (Ones & Viswesvaran, 1996). Given that research on the dispositional source of perceived employability and work-family conflict is still in its initial stage, additional clarification of empirical results is highly desirable.

For example, while most researchers have argued that Agreeableness should be negatively related to perceived work-family conflict because of stronger social support networks (Michel et al., 2011; Wayne et al., 2004), some have argued for opposite effects. Specifically, Bruck and Allen (2003) hypothesized that Agreeableness may predispose individuals to be taken advantage of by the demands of others because of a strong concern to maintain harmony with others. This illustrates that different hypotheses are plausible depending on the specific aspects (facets) of Agreeableness that are supposed to play a role. If one stresses the beneficial effects of characteristics such as being trusting and tender minded with regard to social network building, then one would propose a negative relationship between Agreeableness and work-family

conflict. If one stresses the altruistic (i.e. consideration of others) and/or compliant (i.e. submitting to others) aspects of Agreeableness, then one could propose a positive relationship with work-family conflict.

As another example, previous researchers have repeatedly hypothesized a negative effect of Conscientiousness on perceived work-family conflict, hereby stressing the beneficial effects of characteristics such as being efficient and well organized (e.g., Bruck & Allen, 2003; Michel et al., 2011; Wayne et al., 2004). However, from an alternative point of view one could also expect a positive effect of Conscientiousness when focusing on the achievement striving component of this trait. This is supported by research indicating a significant positive association between Conscientiousness and work involvement (Diefendorff, Brown, Kamin, & Lord, 2002), the latter being also a positive predictor of work-family conflict (Michel et al., 2011).

For perceived employability as well, Big Five factors may be too broad predictors to understand the specific causal mechanisms. Regarding the effect of Extraversion, for instance, two different processes (i.e. a generally positive attitude toward life experiences and an assertive and active behavioral style) were suggested in the present study that may drive more favorable employability perceptions in extraverted people.

These examples illustrate that insight into the more fine grained associations between personality and career outcomes would enhance our theoretical understanding of trait-success associations. To the best of our knowledge, no prior research has examined the dispositional source of perceived employability or work-family conflict at the level of personality facets. These analyses were conducted in an exploratory manner in the present study.

Cross-Sectional and Longitudinal Relationships

Although an examination of concurrent associations already provides a valuable source of evidence, several arguments can be made for considering a longitudinal design to study dispositional antecedents of employability and work-family conflict. Particularly, prospective designs have the irrefutable benefit that they are more appropriate to shed light on the direction of effects, as

conclusions from cross-sectional studies could be potentially spurious (Judge & Kammeyer-Mueller, 2007). Especially when people are asked to concurrently provide subjective evaluations about themselves and their professional situation, it seems likely that there is some contamination between both, complicating inferences with regard to causality. In addition to this methodological caveat, special attention for the issue of directionality is also warranted from a more theoretical perspective. Specifically, interest has increased over the past decade in examining reciprocal relations between traits and work outcomes, and studies have now demonstrated that the experience of a satisfying career can also contribute to personality trait development (Roberts, Caspi, & Moffitt, 2003). Finally, a comparison of concurrent and longitudinal associations is further justified by prior research demonstrating that the validity of traits can substantially vary across time with respect to work outcomes like job performance (Lievens, Ones, & Dilchert, 2009) and extrinsic career success (Judge et al., 1999).

The present study investigates both *concurrent personality-success relations* after 15 years of labor market experience and *prospective effects* of traits, measured at the very beginning of the career, for subsequent career success 15 years later. From an exploratory perspective, we specifically examine (a) the relative importance of T1 versus T2 traits to predict intrinsic career success (i.e. usefulness analysis; Judge et al., 1999), and (b) the validity of traits to predict career success when both personality assessments (T1 and T2) are considered together.

Method

Design and Participants

To test these hypotheses, data are used from a well-documented longitudinal research project on individual differences, labor market entrance, and career development in a Flemish college alumni sample (De Fruyt, 2002; De Fruyt & Mervielde, 1997, 1999; Wille, De Fruyt, & Feys, 2010). In 1994, 934 final year college students from various disciplines enrolled in this research program by filling out extensive personality questionnaires three months prior to

graduation. A first follow-up of the sample was conducted one year later, focusing on participants' initial employment status and nature of employment one year after graduation (see De Fruyt, 2002; De Fruyt & Mervielde, 1999). In 2009, a second follow-up was organized, inviting participants to report online on (a) their personality, (b) their past career trajectories (see Wille et al., 2010), and (c) the indicators of career adjustment after 15 years of labor market experience. For the present study, data are used from the first assessment in 1994 (Time 1; T1) and reports collected in 2009 (Time 2; T2).

The issue of dropout is inherent in longitudinal research designs, especially when time intervals are large. In this study, 206 participants (124 men and 82 women) could be included that provided valid personality descriptions and perceived employability reports at T2. To test for selectivity in dropout, continuers ($n = 206$) were compared to dropouts ($n = 728$) in terms of their T1 Big Five domain and personality facet scores, but no significant differences between both groups were found. For work-family conflict, we only included data of a subsample of 173 participants (104 men and 69 women) that were either married, living with their partner, reported being in a stable relationship, or indicated having at least one child living at home. These criteria are common in research on work-family interference (e.g., Beutell & Greenhaus, 1982; Bruck & Allen, 2003; Frone et al., 1992) and were necessary conditions to adequately answer our work-family conflict questionnaire. Similar as to the employability sample, no significant mean differences in T1 personality scores were found between the 173 continuers and 761 dropouts.

We examined the participants' job titles to get a picture of the type of work they typically fulfilled at T2. There was a large variety of jobs, with occupations ranging from software engineer to academic professor. As all participants were highly educated, jobs were typically higher level white-collar functions across various industries including Building industry ($n = 8$), Power and waterworks ($n = 5$), Financial industry ($n = 13$), Health care ($n = 11$), Sales ($n = 4$), Hotel and catering ($n = 1$), Manufacturing ($n = 37$), Agriculture ($n = 2$), Education ($n = 30$), Government ($n = 42$), Transport and communication ($n = 6$), and Professional services ($n = 47$).

Measures

Personality. At both T1 and T2, five personality factors and their 30 facets were assessed using a Dutch adaptation of the NEO PI-R (Costa & McCrae, 1992), translated by Hoekstra, Ormel and De Fruyt (1996). This instrument consists of 240 items, 48 items per Big Five trait and eight items for each of the 30 underlying facets. Each item reads as a description of behavior that has to be answered on a five point scale ranging from “strongly disagree” to “strongly agree”. The Dutch Revised NEO Personality Inventory is a faithful translation of the NEO PI-R, with a factor structure and psychometric properties closely resembling the normative US Inventory (De Fruyt & Mervielde, 1997). Internal consistencies (Cronbach alpha) of all Big Five scales were high and ranged from .81 (Openness to experience, T1) to .91 (Neuroticism, T1 and T2; Extraversion, T1; Agreeableness, T1; and Conscientiousness, T2). Moderate internal consistencies were found for the NEO-PI-R facets, ranging from .62 (O6: Values, T1) to .87 (N1: Anxiety, T2; O1: Fantasy, T2). A description of the 30 NEO PI-R facets is given in Appendix A.

Intrinsic career success. *Perceived employability* was measured at T2 by four items adopted from the Career Worries Scale of the Career Attitudes and Strategies Inventory (CASI; Holland & Gottfredson, 1994): “*I worry about being able to find another job*”, “*I couldn’t find another job if I quit my current job*”, “*I would have difficulty finding persons to recommend me for a new job*”, and “*I don’t know how to find another job*”. A five-point Likert-type scale was used with responses ranging from strongly disagree (1) to strongly agree (5). All items were reverse scored such that high scores reflect high perceived employability ($M = 3.16$, $SD = 0.63$). To assess the degree of work-family conflict, five items were adopted from the Family Commitment Scale of the CASI: “*Problems and frustrations at work occasionally reduce my ability to be a good partner or parent*”, “*I short-change my family or partner by working too much*”, “*Too much thinking about work isolates me from my family*”, “*I would like to have more time for my family or partner*”, and “*My family has complained that I spend too much time at work*”. Again, items had to be scored using a five-point Likert format, and high scores on this scale reflect a high

degree of work-family conflict ($M = 2.71$, $SD = 0.79$). An exploratory factor analysis (principal component extraction and VARIMAX rotation) of all 9 career success items clearly demonstrated two separate factors explaining 58.7% of the variance, with each item loading primarily and substantially ($> .40$) on its intended factor. A confirmatory factor analysis (conducted in *MPlus5*) provided further support for the construct validity of our outcome measures by showing that this two-factor model yielded good model fit indices ($\chi^2/df = 2.28$, CFI = .95, TLI = .94, RMSEA = .06). A competing one-factor model evidenced poor model fit ($\chi^2/df = 12.02$, CFI = .58, TLI = .42, RMSEA = .23).

Control variables. As research on the determinants of perceived employability is still scarce, we mainly relied on literature concerning the determinants of work-family conflict to identify a number of relevant control variables. Specifically, *gender*, *parental status*, and *number of hours worked* were included as these variables have been shown to be related to work-family conflict (e.g., Wayne et al., 2004). We did not have to control for education level as all participants were highly educated, though we controlled for employment in the (1) profit or (2) non-profit *industry* to account for the broad occupational backgrounds of participants. Gender was coded (1) male and (2) female. Parental status was operationalized by the number of children, ranging from 0 to 4 ($M = 1.37$, $SD = 1.12$). Hours worked was measured by asking participants about the average number of hours worked per week ($M = 43.46$, $SD = 8.99$). All of these control variables were included on exploratory grounds when examining the dispositional source of perceived employability.

Results

Preliminary Analyses

We first computed concurrent and longitudinal correlations between all control variables (T2), Big Five personality traits (T1 and T2), and both indicators of intrinsic career success (T2). The results are shown in Table 1. First, two significant associations were found between our control variables. Gender was positively associated with industry, indicating that women were more likely to work in non-profit environments compared to men ($r = .18$, $p <$

.01). In addition, women reported a smaller number of weekly work hours ($r = -.27, p < .001$).

Gender was also significantly correlated with Big Five trait scores, indicating that -at both personality assessments- women scored significantly higher on Neuroticism (T1: $r = .24, p < .001$; T2: $r = .20, p < .01$) and Agreeableness (T1: $r = .17, p < .05$; T2: $r = .19, p < .01$). The association between gender and Openness was only significant for the T1 personality assessment ($r = .18, p < .01$). We further found some differences in mean personality scores between industries. Specifically, individuals in non-profit work environments at T2 scored higher on T1 Openness ($r = .18, p < .01$) and T2 Agreeableness ($r = .15, p < .05$).

While none of the control variables were significantly associated with perceived employability, our results did indicate two significant associations with work-family conflict. Specifically, higher levels of work-family conflict were reported by individuals working longer hours ($r = .21, p < .01$) and those having more children ($r = .19, p < .05$).

Although not shown in Table 1, we also examined rank-order stability in Big Five traits across the 15-year interval. The results indicated relatively high levels of cross-time stability, with uncorrected test-retest correlations ranging between .58 (Agreeableness) and .70 (Extraversion).

Measured concurrently at T2, each of the five personality traits correlated significantly with at least one of both success indicators. Higher ratings of perceived employability were provided by individuals lower on Neuroticism ($r = -.39, p < .001$) and higher on Extraversion ($r = .27, p < .001$) and Conscientiousness ($r = .18, p < .01$). For work-family conflict, significant concurrent associations were found with Neuroticism ($r = .42, p < .001$), Openness ($r = -.17, p < .05$) and Agreeableness ($r = -.27, p < .001$).

As can be seen in the lower part of Table 1, both indicators of intrinsic success also correlated significantly with Big Five traits as measured 15 years earlier at T1. For perceived employability, the associations with Neuroticism and Extraversion remained significant ($r = -.31, p < .001$ and $r = .18, p < .01$ respectively). For work-family conflict, a positive association with Neuroticism

($r = .29, p < .001$) and negative associations with Openness ($r = -.15, p < .05$) and Agreeableness ($r = -.27, p < .001$) were replicated when personality was considered at T1.

Hierarchical Regressions

To test our hypotheses with regard to Big Five personality traits and intrinsic career success, we conducted a series of four hierarchical regressions (2 dependent variables \times 2 trait assessments). In these analyses, all control variables were entered in a first step, followed by the Big Five traits measured at either T1 or T2. These results are shown in columns ‘T₂→T₂’ (for concurrent associations) and ‘T₁→T₂’ (for longitudinal associations) of Table 2. Note that columns ‘T_{1,2}→T₂’ will be discussed later on in this manuscript.

Consistent with our expectations (*Hypothesis 1a*), perceived employability was negatively related to Neuroticism, and this association was significant in both concurrent and longitudinal analyses ($\beta = -.37$ and $-.31$ respectively, $p < .001$). In addition, employability was also found to be positively related to Openness (*Hypothesis 1d*; $\beta = .19, p < .01$), although this effect was restricted to the concurrent analysis. While we expected employability to be positively related to Agreeableness (*Hypothesis 1e*), the concurrent regression results indicated a significant negative association with this trait ($\beta = -.14, p < .05$). Finally, the expected positive associations between employability and Extraversion (*Hypothesis 1b*) and Conscientiousness (*Hypothesis 1c*) failed to reach significance when Big Five traits were entered as a set in either concurrent or longitudinal analyses.

With regard to work-family conflict, the expected positive association with Neuroticism (*Hypothesis 2a*) was confirmed when examined both concurrently and longitudinally ($\beta = .45$ and $.32$ respectively, $p < .001$). *Hypothesis 2d* that stated a negative association between Agreeableness and work-family conflict was confirmed for personality measured at the career start ($\beta = -.20, p < .01$), but this effect disappeared when examined concurrently with work-family conflict at T2 ($\beta = -.11, p > .05$). The expected negative association with Extraversion (*Hypothesis 2b*) was not confirmed, neither in concurrent nor

in longitudinal analyses. Also in contrast with our expectations (*Hypothesis 2c*), we found that individuals high on Conscientiousness reported higher levels of work-family conflict ($\beta = .14, p < .05$), although this effect was also only significant when T1 measures of personality were considered. Finally, although no significant associations were expected, T2 Openness to experience was negatively related to concurrent perceptions of work-family conflict ($\beta = -.15, p < .05$).

Facet Level Analyses

Facet level analyses were conducted in order to get a more detailed picture of personality-success associations. The results in Table 3 show the partial correlations between both intrinsic career outcomes and each of the 30 NEO PI-R facets, measured concurrently (columns ‘ $T_2 \rightarrow T_2$ ’) as well as prospectively (columns ‘ $T_1 \rightarrow T_2$ ’). Correlations are controlled for the same control variables that were included in the domain level regressions.

With regard to perceived employability, the results first show that the consistent negative association with Neuroticism is accounted for by all six facets except N5: Impulsiveness and N2: Angry hostility. The positive (non-significant) domain level association with Extraversion reflects relatively consistent relationships with E4: Activity (T2: $r = .16, p < .05$; T1: $r = .17, p < .05$), E5: Excitement seeking (T2: $r = .21, p < .01$; T1: $r = .20, p < .01$), E6: Positive emotions (T2: $r = .30, p < .001$; T1: $r = .14, p < .05$) and to a lesser extent E3: Assertiveness (only a significant concurrent association; $r = .19, p < .01$). Only two facets of Openness were significantly related to employability: more favorable marketability perceptions were consistently associated with O4: Actions (T2: $r = .22, p < .01$; T1: $r = .24, p < .01$) and with middle adulthood O6: Values ($r = .15, p < .05$). Interestingly, two opposite effects were found with regard to the effects of Agreeableness facets. While A1: Trust, measured at young and middle adulthood correlated positively to perceived employability (T2: $r = .18, p < .05$; T1: $r = .15, p < .05$), a negative association was found with middle adulthood A5: Modesty ($r = -.15, p < .05$) and young adulthood A2: Straightforwardness ($r = -.14, p < .05$). Finally, middle adulthood employability

was positively associated with concurrent measures of C1: Competence ($r = .33$, $p < .001$), C4: Achievement striving ($r = .25$, $p < .01$), and C5: Self discipline ($r = .34$, $p < .001$). Of these Conscientiousness facets, only C5: Self discipline predicted perceived employability in the longitudinal analyses ($r = .17$, $p < .05$).

Work-family conflict was positively associated with all subscales of Neuroticism, although the effects of N5: Impulsiveness and N6: Vulnerability were only significant when middle adulthood measures were considered ($r = .16$, $p < .05$ and $r = .38$, $p < .001$ respectively). Contradictory results were found for facets of Extraversion: although work-family conflict was negatively associated with early adulthood E1: Warmth ($r = -.17$, $p < .05$), early adulthood E2: Gregariousness ($r = -.23$, $p < .01$), middle adulthood E5: Excitement seeking ($r = -.18$, $p < .05$) and with both assessments of E6: Positive emotions ($r = -.33$, $p < .001$ for T2 and $r = -.21$, $p < .01$ for T1); a significant positive association was found with E4: Activity, at least when measured at T2 ($r = .17$, $p < .05$). Only one Openness facet, i.e. middle adulthood O5: Ideas, demonstrated a modest negative relationship with work-family conflict ($r = -.20$, $p < .05$). Further, the results showed that the negative concurrent and longitudinal associations with Agreeableness are attributable to the consistent negative effects of A1: Trust (T2: $r = -.24$, $p < .01$; T1: $r = -.25$, $p < .01$), A2: Straightforwardness (T2: $r = -.16$, $p < .05$; T1: $r = -.16$, $p < .05$), A3: Altruism (T2: $r = -.18$, $p < .05$; T1: $r = -.19$, $p < .05$) and A4: Compliance (T2: $r = -.25$, $p < .001$; T1: $r = -.22$, $p < .01$), while the effect of A6: Tendermindedness was only significant in the longitudinal analysis ($r = -.22$, $p < .01$). Finally, work-family conflict was negatively associated with middle adulthood measures of C1: Competence ($r = -.31$, $p < .001$) and C5: Self discipline ($r = -.26$, $p < .01$), and positively with young adulthood measurement of C4: Achievement striving ($r = .17$, $p < .05$).

We subsequently performed a series of stepwise multiple regressions in order to identify the most parsimonious set of predictors (NEO PI-R facets and control variables) that are most effective in predicting both dependent variables (e.g., De Fruyt, 1997; Watson, 2001). For the concurrent associations between personality facets and perceived employability, stepwise analysis produced a

solution accounting for 26.3% of the variance with N3: Depression (16.9%), O4: Actions (4.2%), C1: Competence (3.5%), and N1: Anxiety (1.7%) significantly predicting perceived employability. In the longitudinal analysis, a regression model was obtained explaining 21.7% of the variance with N1: Anxiety (13.1%), N4: Self consciousness (2.3%), O4: Actions (2.3%), C5: Self discipline (2.2%), and E5: Excitement seeking (1.8%) significantly predicting perceived employability. Regarding the concurrent prediction of work-family conflict, the stepwise regression indicated a model explaining 39.2% of the variance attributable to N1: Anxiety (12.7%), N6: Vulnerability (6.3%), work hours (6.1%), number of children (5.0%), O5: Ideas (2.9%), E6: Positive emotions (2.9%), E4: Activity (1.8%), and C1: Competence (1.5%). Finally, the longitudinal stepwise analysis for work-family conflict produced a solution accounting for 31.4% of the variance with N3: Depression (9.2%), A6: Tendermindedness (8.7%), work hours (4.2%), number of children (4.0%), C4: Achievement striving (3.8%), and N2: Angry hostility (1.5%) as significant predictors.

Concurrent versus Longitudinal Associations

Lastly, the relative importance of T1 versus T2 domain level traits was evaluated in two ways. First, a ‘usefulness analysis’ (e.g., Judge et al., 1999) was conducted to compare the percentages of incremental variance explained by both trait assessments (see Table 4). In addition, we also examined which Big Five traits remained significant predictors when both trait assessments were considered simultaneously (see columns ‘ $T_{1,2} \rightarrow T_2$ ’ in Table 2). The results in Table 4 indicate that middle adulthood personality traits accounted for substantially more of the variance in both success indicators compared to traits measured 15 years earlier: the percentages explained variance dropped from .20 to .11 (employability) and from .26 to .18 (work-family conflict) when T1 traits are used as predictors compared to T2 traits. Furthermore, although we found middle adulthood traits to add significantly and substantially to the prediction of employability and work-family conflict beyond early adulthood traits ($\Delta R^2 = .10$ and .12 respectively, $p < .001$), the increments associated with young adulthood

traits were not significant. However, at the level of individual traits, the results in Table 2 (columns ‘ $T_{1,2} \rightarrow T_2$ ’) *do* provide support for the validity of T1 traits, especially with regard to work-family conflict. It is specifically demonstrated that two Big Five traits, T1 Agreeableness and T1 Conscientiousness, continue to be significant predictors of this career outcome even when T2 personality is taken into account ($\beta = -.18$ and $.18$ respectively, $p < .05$).

Discussion

Big Five Traits and Contemporary Career Success

In times of severe economic recession and employers mainly focusing on downsizing and cost reduction, workers from around the globe must contend with the reality of rising job insecurity (König et al., 2011). Given that an individual’s perceptions of employability are both an indicator of intrinsic career success and a critical condition for extrinsic career success (De Vos et al., 2011; Forrier & Sels, 2003; Hall, 2002; Van der Heijde & Van der Heijden, 2006), it is important to investigate potential dispositional correlates.

In addition, we also studied the interference between work and family roles as a second by-product of current careers. Because men and women are increasingly occupying dual roles of breadwinner and homemaker, the issue of work-family conflict has become more prominent, and the significance of this construct has extensively been denoted by studies demonstrating significant associations with indicators of personal and professional well-being. Nevertheless, up until now the issue of work-family conflict has been conspicuously absent from the literature on personality and career success (Heslin, 2005; Judge & Kammeyer-Mueller, 2007).

All together, our results largely confirmed our expectations regarding the associations between Big Five traits and both indicators of contemporary intrinsic career success, although some relationships failed to reach statistical significance. For example, although we expected extraverts to report lower levels of work-family conflict because of their tendency to evaluate life more positively and/or effective goal-directed behaviors, no significant effects were found. Although this is in contrast with what can theoretically be expected, it

should be noted however that some prior studies also failed to find any significant associations between Extraversion and indicators of work-family conflict (Rantanen, Pulkkinen, & Kinnunen, 2005; Stoeva et al., 2002). This strengthens the idea that Extraversion has a less significant impact on work-family conflict compared to for example Neuroticism, which held a relatively strong association with inter-role conflict, both concurrently and longitudinally. Individuals high on Neuroticism might detect and report incompatibilities between work and family roles more easily and experience these as more threatening than would individuals low on Neuroticism. Our results thus further validate the idea of Neuroticism being an important risk factor for experiencing work-family conflict (e.g., Bruck & Allen, 2003; Rantanen et al., 2005).

Two of our findings differed substantially from our hypotheses and from what has been reported elsewhere. First, instead of a positive association between employability and Agreeableness, our concurrent regression analysis indicated a significant negative association, implying that low agreeable individuals reported higher levels of marketability compared to those higher on Agreeableness. Although this is in contrast with our reasoning about the potential benefits of empathic interpersonal skills for networking activities, it is not entirely opposed to what is known about the effects of Agreeableness on other success indicators. Specifically, research on extrinsic career success has indicated negative associations between Agreeableness and outcomes like income, hierarchical level, and number of acquired promotions (e.g., Boudreau & Boswell, 2001). The fact that we identified a similar association with self-perceived marketability follows this pattern and could hence be an indication that this outcome is to some extent related to these traditional indicators of extrinsic career success. Nonetheless, our finding that perceived employability is also significantly associated with Openness to experience, a trait that has typically been shown to demonstrate no or very inconsistent associations with extrinsic career success (e.g., Boudreau & Boswell, 2001; Judge et al., 1999), simultaneously indicates the uniqueness of this construct as a success indicator.

A second finding that specifically caught our attention concerns the positive longitudinal association between Conscientiousness and work-family

conflict. While previous research found some support for the hypothesis that the planning and organizing skills that are characteristic for conscientious individuals should help them to prevent family conflicts from occurring (e.g., Bruck & Allen, 2003), our results paint another picture. Specifically, our finding that individuals high on Conscientiousness perceive higher levels of work-family conflict 15 years later could be a result of their strong persistence in the pursuit of professional goals, next to the achievement of family objectives and commitment. This is further supported by research demonstrating that highly Conscientious individuals tend to place work more central in their lives (Diefendorff et al., 2002).

Interestingly, the results of our study unexpectedly showed a significant negative association between concurrent measures of Openness to experience and perceived work-family conflict. One explanation might be that we used a very comprehensive personality measure that considers various facets of the complex Openness domain. Indeed, facet level analysis indicated that only one specific aspect of Openness, i.e. O5: Ideas, was significantly related to perceived work-family conflict. Individuals high on this facet are open-minded and willing to consider new, perhaps unconventional ideas. Our findings could suggest that these individuals use more creative solutions to manage work and nonwork domain stressors than those low on this facet of Openness (e.g., Michel et al., 2011).

As the example above indicates, an important contribution of the present study entailed the possibility to examine facet level associations besides the effects of the broad Big Five domains. As expected, these more fine grained analyses provided a number of valuable new insights into the specific nature of trait-success associations. With regard to perceived employability, for instance, we found that *O4: Actions* (i.e., openness to new experiences on a practical level) in particular contributed to the positive association with Openness, providing a first and provisional indication that engagement in skill development activities might indeed foster employability perceptions. Furthermore, the rather unexpected negative relationship between employability and Agreeableness can -in part- be explained by referring to the tendency of low agreeable individuals

to be less modest. Of course, it remains to be examined whether this modesty only downgrades subjective perceptions and reports of employability, or actually contributes to less favorable situations of personal market value. With regard to work-family conflict, facet level results suggest that the absence of a significant association with Extraversion might be due to opposite facet level effects neutralizing each other at the domain level. Furthermore, while previous researchers hypothesized that higher energy levels might enable extraverts to accomplish more in a given amount of time, thereby reducing work-family conflict (e.g., Wayne et al., 2004), our results rather indicate that higher activity levels contribute to inter-role conflict. On the other hand, the results indeed illustrate that their increased focus on the positive aspects of situations acts as a counterforce for developing problems with work/life balance. Finally, facet information also helps to explain the unexpected longitudinal association between work-family conflict and Conscientiousness. Indeed, this seems to reflect a stronger level of achievement striving in highly conscientious individuals at the beginning of their career.

In sum, the design of our study allows for some general theoretical conclusions about the nature of personality-success relations. Our results particularly indicate that the existence of these associations as well as their strength is dependent on (a) whether traits are studied separately or simultaneously in relation to these outcomes, and (b) whether they are examined concurrently or longitudinally. With regard to the first condition, we believe that this points out the importance of using comprehensive personality taxonomies, like the Big Five framework, when examining the dispositional source of career outcomes. Clearly, including only one or two separate traits does not allow a complete examination of personality effects on career success. Secondly, comparing concurrent associations with long-term prospective effects of traits on career outcomes provided a number of interesting insights into the stability of personality-success relations. As expected, we found that the strength of these associations was generally stronger in concurrent compared to longitudinal analyses, as indicated by the percentages of explained variance. Furthermore, our results also indicated that the predictive validity of separate traits also varied

over time, and that this moreover depended on the specific career outcome that was considered. For employability, for instance, we identified two significant concurrent associations (with Openness and Agreeableness) that were not significant when studied longitudinally. For work-family conflict, on the other hand, Agreeableness and Conscientiousness showed long-term prospective effects on future career success, but these effects disappeared in the concurrent analysis. The latter is especially important because it implies that the results of our ‘usefulness analysis’ should be nuanced: although we found that young adulthood traits did not significantly add to the prediction of career success in terms of incremental validity, these results concerning work-family conflict did indicate some relevance in considering personality traits measured at the very beginning of the career when studying dispositional risk factors.

In terms of implications for practice, it is important to note that establishing a significant dispositional source of subjective career outcomes does not reduce the responsibility of organizations in optimizing these outcomes for employees. In the present study, personality assessments accounted for 21 to 30 percent of the variance in perceived employability and work-family conflict respectively, leaving much of the variance in both career outcomes unexplained and open to other factors, such as environmental influences. Indeed, research has recently demonstrated that participation in competency development initiatives offered by the organization is important for enhancing employees’ marketability perceptions (De Vos et al., 2011). Similarly, research on the antecedents of work-role conflict has indicated that many of the influential factors, such as work role stressors, are under the control of the organization, and organizations that are interested in reducing levels of work-family conflict would particularly benefit from focusing on reducing work role conflict, work role ambiguity, and work role overload (Michel et al., 2011).

However, the fact that personality traits only explain a part of the variation in intrinsic career success does not mean that these results are not valuable from an applied perspective. Specifically, knowledge of individual differences may help to maximize the effectiveness of organizational programs. For example, neurotic individuals could benefit from Employee Assistance

Programs (EAPs) developed to help them understand their propensity to view experiences negatively and to coach them how to view (a) their own labor market value as less precarious and (b) work-family conflict as less threatening. Also, when working on individuals' perceptions of employability, our results suggest tackling overly modest tendencies and conversely promoting a more self-confident and ambitious attitude. Finally, in order to alleviate concerns regarding work-family conflict, highly agreeable employees could be trained in techniques describing how to efficiently demonstrate resistance when others' requests jeopardize a personal planning. Less conscientious individuals could be taught specific work behaviors in order to enhance personal efficiency (e.g., through time management training).

Limitations and Research Perspectives

Several limitations with this study should be noted. First, although we are convinced that self-perceptions of work-family conflict and employability are valuable criteria, we acknowledge that peer reports of these constructs (e.g., spouse reports of work-family conflict and supervisor ratings of employability) would offer important additional information. Specifically, they could help to answer the question to what extent personality traits are merely affecting personal perceptions, rather than actually shaping "objective" situations.

Second, some conceptual comments can be made concerning both indicators of success included in this study. We only approached work-family balance from a conflict perspective, while researchers have also argued for the benefits of multiple role occupation. Therefore, future research could also consider positive spillover between work and family roles as an indicator of contemporary career success. With regard to employability, it should be noted that we only studied *external* marketability, i.e. the beliefs that one is valuable to other employers. Future research, using for instance Rothwell and Arnold's (2007) perceived employability scale, could also consider *internal* marketability as an additional indicator of career success.

With respect to the sample, while it was diverse in terms of the type of jobs held as well as industries and organizations sampled, participants were

highly homogeneous with regard to age, education level, and race. Although these characteristics impose a number of limitations with regard to the generalizability of our findings, they simultaneously offered the opportunity to investigate trait effects on career success in a sample of participants that were all going through the same career stage and were all confronted with similar challenges, irrespective of their specific professional backgrounds. The fact that we only included Flemish college alumni has to be acknowledged given that past research on more traditional indicators of career success has suggested that differences exist in trait-success associations between cultures (e.g., Boudreau & Boswell, 2001).

A unique feature of our study entailed the possibility to examine the longitudinal associations between personality traits and two indicators of intrinsic career success, and to compare these results with findings from concurrent analyses. It should be noted, however, that T2 personality traits and T2 career success were measured at the same point in time, meaning that associations between these variables can be overestimated due to response tendencies and/or participants' current affective states. To provide a more accurate estimate of the concurrent associations between personality and career success, the measurement of both constructs should be separated in time (e.g., a one-month time interval).

Finally, the present investigation focused on personality traits as distal antecedents of intrinsic career success, and future research is needed to clarify the more proximal processes, such as job choice or work behavior, through which traits can influence career success. For example, we replicated the negative association between work-family conflict and Agreeableness in our longitudinal study, but questions remain about the precise interpretation of this effect. Is it due to a specific use of and access to social support mechanisms at work (e.g., Bruck & Allen, 2003), or does it reflect an egocentric tendency of low scorers to value their own professional prosperity over the quality of their family life? In a similar vein, future research is needed that examines whether and how specific job (e.g., performance) or career related behaviors (e.g.,

engagement in training activities) mediate the relationship between personality traits and employability.

Conclusion

The present study contributed to research on the dispositional source of career success by including an additional set of two success indicators that are highly relevant in contemporary boundaryless careers. This study was the first to examine longitudinal and concurrent associations between Big Five traits and perceived employability, opening the door for future investigations on the antecedents of this relatively new construct in career research. In addition, as suggested by Judge and Kammeyer-Mueller (2007) and Heslin (2005), the issue of work-family conflict was successfully added to the scope of success research, and our longitudinal design provided further evidence for the potential dispositional risk factors that have also been identified in former cross-sectional studies. Finally, the possibility to explore facet level associations with both outcomes proved to be a promising way toward a better understanding of their dispositional source. It is concluded that the present study offers a number of valuable insights into the dispositional nature of career success beyond more traditional and extensively studied outcomes like satisfaction or financial and hierarchical attainment.

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Tables

Table 1

Intercorrelations between study variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Gender	-	.18**	-.27 [†]	-.06	.20**	.01	.11	.19**	.03	-.12	.00
2. Industry (T2)	.18**	-	-.26 [†]	.08	-.02	.04	.06	.15*	-.03	-.05	-.05
3. Work hours (T2)	-.27 [†]	-.26 [†]	-	-.06	-.14*	.19**	-.10	-.22**	.10	.12	.21**
4. Children (T2)	-.06	.08	-.06	-	-.10	.19**	-.02	.03	.03	.04	.19*
5. Neuroticism	.24 [†]	.00	-.09	-.09	(.91-.91)	-.34 [†]	.09	-.23**	-.40 [†]	-.39 [†]	.42 [†]
6. Extraversion	.03	-.01	.10	.12	-.30 [†]	(.91-.90)	.19**	.01	.11	.27 [†]	-.12
7. Openness	.18**	.18**	-.11	-.02	.15*	.16*	(.81-.89)	.19**	-.22**	.13	-.17*
8. Agreeableness	.17*	.11	-.13	.06	-.15*	.10	.16*	(.91-.90)	.07	-.03	-.27 [†]
9. Conscientiousness	.02	.01	.05	.07	-.31 [†]	.19**	-.12	.10	(.90-.91)	.18**	-.12
10. Employability (T2)	-.12	-.05	.12	.04	-.31 [†]	.18**	.06	-.05	.07	(.78)	-.20*
11. Work-family conflict (T2)	.00	-.05	.21**	.19*	.29 [†]	-.13	-.15*	-.27 [†]	.05	-.20*	(.81)

Note. Correlations below the diagonal are for the young adulthood assessments of personality (T1). Correlations above the diagonal are for the middle adulthood personality assessments (T2). Gender is coded (1) male and (2) female; Industry is coded (1) profit and (2) non-profit sector. Where appropriate, coefficient alphas are on the diagonal. For Big Five traits, T1 alpha is followed by T2 alpha. * $p < .05$; ** $p < .01$; [†] $p < .001$.

Table 2

Longitudinal and concurrent relations between Big Five traits and intrinsic career success

Variables	Employability (T2)						Work-family conflict (T2)					
	T2→T2		T1→T2		T1,2→T2		T2→T2		T1→T2		T1,2→T2	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1		.02		.02		.02		.09**		.09**		.09**
Gender	-.03		-.02		-.01		.06		.11		.06	
Industry (T2)	-.04		-.04		-.04		.05		.02		.04	
Work hours (T2)	.01		.07		.01		.28 [†]		.22**		.27 [†]	
Children (T2)	-.01		.01		-.01		.25 [†]		.24**		.25 [†]	
Step 2		.20 [†]		-		.20 [†]		.26 [†]		-		.26 [†]
Neu (T2)	-.37 [†]		-		-.31 [†]		.45 [†]		-		.40 [†]	
Ext (T2)	.11		-		.10		-.02		-		.05	
Ope (T2)	.19**		-		.19*		-.15*		-		-.16	
Agr (T2)	-.14*		-		-.10		-.11		-		-.02	
Con (T2)	.08		-		.12		.01		-		-.10	
Step 3		-		.11 [†]		.01		-		.18 [†]		.04
Neu (T1)	-		-.31 [†]		-.10		-		.32 [†]		.06	
Ext (T1)	-		.07		.00		-		-.08		-.08	
Ope (T1)	-		.12		.00		-		-.07		.01	
Agr (T1)	-		-.10		-.07		-		-.20**		-.18*	
Con (T1)	-		-.02		-.07		-		.14*		.18*	

Note. Neu = Neuroticism; Ext = Extraversion; Ope = Openness to experience; Agr = Agreeableness; Con = Conscientiousness. Standardized β coefficients are reported from the extended model. * $p < .05$; ** $p < .01$; [†] $p < .001$.

Table 3

Partial correlations between NEO PI-R facets and intrinsic career success

NEO-PI-R facets	Reliability	Employability		Work-family conflict	
	α	T2→T2	T1→T2	T2→T2	T1→T2
Neuroticism					
N1: Anxiety	.84-.87	-.36 [†]	-.34 [†]	.34 [†]	.27 [†]
N2: Angry hostility	.73-.74	-.14	-.05	.37 [†]	.32 [†]
N3: Depression	.78-.82	-.40 [†]	-.28 [†]	.33 [†]	.35 [†]
N4: Self Consciousness	.66-.72	-.28 [†]	-.36 [†]	.29 [†]	.26 ^{**}
N5: Impulsiveness	.73-.74	.02	.06	.16 [*]	.10
N6: Vulnerability	.77-.76	-.37 [†]	-.19 [*]	.38 [†]	.13
Extraversion					
E1: Warmth	.76-.76	.10	.03	-.13	-.17 [*]
E2: Gregariousness	.80-.81	.08	.12	-.13	-.23 ^{**}
E3: Assertiveness	.84-.82	.19 ^{**}	.12	-.11	-.07
E4: Activity	.69-.71	.16 [*]	.17 [*]	.17 [*]	.05
E5: Excitement seeking	.67-.70	.21 ^{**}	.20 ^{**}	-.18 [*]	-.10
E6: Positive emotions	.69-.72	.30 [†]	.14 [*]	-.33 [†]	-.21 ^{**}
Openness to experience					
O1: Fantasy	.83-.87	.09	.11	-.12	-.06
O2: Aesthetics	.79-.80	.04	-.05	-.04	-.04
O3: Feelings	.74-.72	.10	-.01	-.03	-.03
O4: Actions	.67-.73	.22 ^{**}	.24 ^{**}	-.07	-.10
O5: Ideas	.73-.75	.10	.04	-.20 [*]	-.15
O6: Values	.62-.64	.15 [*]	.05	-.13	-.10
Agreeableness					
A1: Trust	.84-.86	.18 [*]	.15 [*]	-.24 ^{**}	-.25 ^{**}
A2: Straightforwardness	.78-.82	-.01	-.14 [*]	-.16 [*]	-.16 [*]
A3: Altruism	.73-.71	.06	-.10	-.18 [*]	-.19 [*]
A4: Compliance	.70-.68	-.07	-.07	-.25 [†]	-.22 ^{**}
A5: Modesty	.81-.78	-.15 [*]	-.03	-.12	-.14
A6: Tendermindedness	.71-.70	.10	-.07	-.13	-.22 ^{**}
Conscientiousness					
C1: Competence	.65-.70	.33 [†]	.11	-.31 [†]	.01
C2: Order	.67-.72	.07	-.02	-.05	-.02
C3: Dutifulness	.67-.64	.07	.02	-.03	.05
C4: Achievement striving	.80-.78	.25 ^{**}	.07	-.01	.17 [*]
C5: Self discipline	.75-.77	.34 [†]	.17 [*]	-.26 ^{**}	-.06
C6: Deliberation	.77-.78	.01	-.13	-.11	-.01

Note. Reliabilities (Cronbach alpha) of personality facets are provided for T1 and T2 respectively. T2→T2 refers to middle adulthood traits predicting middle adulthood career success (concurrent analysis). T1→T2 refers to young adulthood Big Five traits predicting middle adulthood career success (longitudinal analysis). Correlations are controlled for gender, industry, work hours and number of children. * $p < .05$; ** $p < .01$; † $p < .001$

Table 4

Usefulness analysis of young and middle adulthood personality assessments

Big Five traits	Employability	Work-family conflict
Young adulthood personality		
R^2	.11***	.18***
ΔR^2	.01	.04
Middle adulthood personality		
R^2	.20***	.26***
ΔR^2	.10***	.12***
Combined personality		
R^2	.21***	.30***

Note. R^2 values are when the respective blocks of traits were entered alone into the regression. Incremental (Δ) R^2 values are when the young adulthood personality traits were entered after the 5 middle adulthood traits, or when the 5 middle adulthood were entered after the young adulthood traits. Combined personality values are when all 10 traits were entered into the equation together. Gender, industry, work hours and number of children were included as control variables in all analyses. *** $p < .001$

 Appendix A

NEO PI-R facets	High scorers...
N1: Anxiety	...are apprehensive, fearful, prone to worry, nervous, tense and jittery.
N2: Angry hostility	...are hot-tempered, angry, and frustrated.
N3: Depression	...are prone to feelings of guilt, sadness, hopelessness and loneliness.
N4: Self consciousness	...are uncomfortable around others, sensitive to ridicule, and prone to feelings of inferiority.
N5: Impulsiveness	...are unable to resist cravings, hasty, sarcastic and self-centered.
N6: Vulnerability	...are easily rattled, panicked, and unable to deal with stress.
E1: Warmth	...are characterized as being outgoing, talkative and affectionate.
E2: Gregariousness	...are convivial, have many friends, and seek social contact.
E3: Assertiveness	...are dominant, forceful, and socially ascendant.
E4: Activity	...are described as being energetic, fast-paced and vigorous.
E5: Excitement seeking	...crave excitement and stimulation.
E6: Positive emotions	...are seen as cheerful, high-spirited, joyful, and optimistic.
O1: Fantasy	...have a vivid imagination and an active fantasy life.
O2: Aesthetics	...have a deep appreciation of art and beauty.
O3: Feelings	...experience deeper and more differentiated emotional states and feel both happiness and unhappiness more intensely than others.
O4: Actions	...prefer novelty and variety to familiarity and routine.
O5: Ideas	...enjoy both philosophical arguments and brain-teasers
O6: Values	...are seen as tolerant, broad-minded, nonconforming, and open-minded.
A1: Trust	...have a disposition to believe that others are honest and well intentioned.
A2: Straightforwardness	...are characterized as being direct, frank, candid, and ingenuous.
A3: Altruism	...have an active concern for others' welfare as shown in generosity, consideration of others, and a willingness to assist others in need of help.
A4: Compliance	...tend to defer to others, to inhibit aggression, and to forgive and forget.
A5: Modesty	...are humble and self-effacing although they are not necessarily lacking in self-confidence or self-esteem.
A6: Tendermindedness	...moved by others' needs and emphasize the human side of social policies.
C1: Competence	...feel well prepared to deal with life. They are perceived by others as being efficient, thorough, confident and intelligent.
C2: Order	...are neat, tidy and well organized.
C3: Dutifulness	...adhere strictly to their ethical principles and scrupulously fulfill their moral obligations.
C4: Achievement striving	...have high aspiration levels and work hard to achieve their goals.
C5: Self discipline	...have the ability to motivate themselves to get the job done.
C6: Deliberation	...are cautious and deliberate. They are described as being cautious, logical, and mature.

Chapter 3

Expanding and reconceptualizing aberrant personality at work: Validity of Five-Factor Model aberrant personality tendencies to predict career outcomes¹

Abstract

This study proposes and tests an alternative methodology to conceptualize and assess aberrant personality tendencies at work beyond the dark triad. A sample of college alumni (N=247) were administered the NEO PI-R prior to entering the labor market and 15 years later when their professional careers had unfolded. Drawing on the dimensional perspective on personality functioning, six Five-Factor Model (FFM) aberrant compounds were computed as indicators of aberrant personality tendencies. As expected, FFM aberrant personality tendencies were highly stable across time, with test-retest correlations ranging from .61 (Narcissistic) to .73 (Avoidant). With regard to predictive validity, Borderline, Schizotypal and Avoidant tendencies were negatively associated with extrinsic and intrinsic career outcomes. The Obsessive-Compulsive tendency was largely unrelated to career outcomes, whereas individuals with Antisocial and Narcissistic characteristics tended toward higher hierarchical and financial attainment. Additionally, relative importance analyses indicated that (a) FFM aberrant personality tendencies showed incremental validity in the prediction of career outcomes beyond FFM general traits, and that (b) both FFM general and FFM aberrant personality tendencies are important predictors when considered jointly.

¹ Wille, B., De Fruyt, F., & De Clercq, B. (in press). Expanding and reconceptualizing aberrant personality at work: Validity of Five-Factor Model aberrant personality tendencies to predict career outcomes. *Personnel Psychology*.

Introduction

Increased attention is being devoted in recent Industrial and Organizational (I/O) psychology, management, and leadership literature to deviant personality traits at work (e.g., Campbell, Hoffman, Campbell, & Marchisio, 2011; Harms, Spain, & Hannah, 2011; O'Boyle, Forsyth, Banks, & McDaniel, 2012; Wu & Lebreton, 2011). The dark triad (Paulhus & Williams, 2002) in particular has extensively been suggested (Wu & Lebreton, 2011) and been employed (O'Boyle et al., 2012) to study the effects of aberrant personality traits on various indicators of work performance. The dark triad consists of three personality traits -Machiavellianism, narcissism, and psychopathy- that have in common that they “reflect a tendency to be callous, selfish, and malevolent in their interpersonal dealings” (Paulhus & Williams, 2002, p. 100). The three traits have proven to constitute an attractive taxonomy to conceptualize aberrant personality at work, and there is now considerable evidence that each of them play a significant role in organizational behavior. The downside of the success of the dark triad, however, is that other potentially relevant aberrant personality tendencies risk being overlooked.

Aberrant personality tendencies can be defined as personality peculiarities that do not necessarily lead to clinically impaired functioning (like personality disorders), but that may affect daily functioning (at work) in such ways that they deserve further attention. This definition of aberrant personality has three important implications. First, aberrant personality tendencies are defined at a subclinical level, indicating a quantitative rather than a qualitative distinction between ‘normal’ and ‘abnormal’ personality. This is consistent with recent developments in clinical and psychiatric literature that advance a dimensional perspective on personality functioning instead of a categorical approach. We believe that such a *reconceptualization* is also warranted in I/O literature, which is too often framed in the sphere of a duality between ‘bright side’ and ‘dark side’ personalities (Khoo & Burch, 2008; Resick, Whitman, Weingarden, & Hiller, 2009).

Second, it is important to note that aberrant personality tendencies are not defined solely in terms of the potential *impairing* effects that they may produce.

As our literature overview will indicate, aberrant personality tendencies might also -at least under certain circumstances or depending on the criteria that are evaluated- lead to positive consequences for the individual in work-related contexts, for instance in terms of hierarchical attainment. The term ‘aberrant’ is therefore preferred over alternatives such as ‘maladaptive traits’ (e.g., Wu & Lebreton, 2011, p. 597) or ‘dysfunctional personality styles’ (e.g., Moscoso & Salgado, 2004) which only acknowledge negative consequences. Further, this issue urges the inclusion of a broad range of work-related outcomes when studying the effects of aberrant tendencies in work contexts, and to take specific employment characteristics into account.

Finally, and perhaps most importantly, this definition of ‘aberrant personality’ is much broader than what is covered by the dark triad. Besides being callous, selfish, and malevolent in social interactions, people’s personality tendencies may also cause them to behave in other conspicuous manners on the work floor. Specifically, aberrant tendencies covering the odd/eccentric domain (e.g., Schizotypal) or tendencies from the anxious/fearful cluster (e.g., Avoidant) remain untargeted by the dark triad, despite their potential relevance in work settings.

A much broader taxonomy of aberrant personality can be found in clinical psychology and psychiatry, where personality dysfunction is described on Axis II of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). The current version of the DSM specifically articulates ten personality disorders (PDs), including the paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent, and obsessive-compulsive PDs, plus two additional PDs described in the DSM appendix (i.e., depressive and passive-aggressive PDs). PDs can be defined as “pervasive, inflexible and enduring patterns of inner experiences and behavior that can lead to clinically significant distress or impairment in social, *occupational*, or other areas of functioning” (APA, 2000). Although this taxonomy has widely and successfully been used to predict clinical outcomes (e.g., depression; Reichborn-Kjennerud et al., 2010) and social impairment (e.g., Whisman & Schonbrun, 2009), it has only received limited attention with regard

to occupational functioning (e.g., Ettner, Maclean, & French, 2011; Lim, Sanderson, & Andrews, 2000).

In one recent study, Ettner and colleagues (2011) examined whether axis II PDs were associated with negative labor market outcomes using data from a nationally representative sample of 28,000 working age individuals in the United States. Their results first indicated that 18% of men and 16% of women in this sample of working adults qualified for at least one clinical PD. Regarding occupational functioning, these authors found that individuals suffering from PDs were more likely to experience negative labor market consequences such as chronic unemployment, being fired or laid off, and having trouble with a boss or coworker. Interestingly, the magnitude of the association with having trouble with a boss or coworker was larger for the obsessive-compulsive personality disorder than for the antisocial personality disorder.

These results are compelling in several ways. First, the prevalence numbers indicate that in any large organization there is a strong likelihood that there are individuals severely struggling with their own personality tendencies and other individuals that have to get along and collaborate with a colleague with a pervasive personality problem. Second, this study illustrates that although PDs range from the highly deviant (e.g. antisocial PD) to the less pathological (e.g., obsessive-compulsive PD), all PDs can cause serious problems in interpersonal relationships, including those at work.

Studies examining the consequences of clinical PDs in work contexts (e.g., Ettner et al., 2011; Gunderson & Hourani, 2003; Lim et al., 2000) are important because they illustrate that a broad spectrum of personality problems, outside the scope of the dark triad, are associated with occupational functioning, as suggested by the DSM. They are limited, however, in terms of their implications for practice because they only consider clinical levels of aberrant personality. Although there are certainly those in organizations who cross the line into a clinical personality disorder, holding to the line of clinical diagnosis might cause us to miss many of the more common occurrences of aberrant personality. In addition, such a categorical perspective on personality

functioning is only of marginal use for the assessment of aberrant personality tendencies in employee selection or development contexts.

The contributions of the present study for I/O psychology and management literature on aberrant personality tendencies at work are fourfold. First, we consider a *broadened* spectrum of aberrant personality tendencies covering more ground than the dark triad which is typically used. We specifically consider six aberrant personality tendencies (i.e. Schizotypal, Avoidant, Borderline, Antisocial, Narcissistic, and Obsessive-Compulsive) which are derived from the most recent clinical taxonomy, i.e. DSM-5 (www.dsm5.org), to study personality functioning. Second, our conceptualization and operationalization of aberrant personality are original as these are explicitly grounded in the validated dimensional perspective on personality functioning (e.g., Costa & Widiger, 2002; Widiger & Lowe, 2007; Widiger & Trull, 2007). We specifically propose the Five-Factor Model (FFM) compound technique (Miller, Bagby, Pilkonis, Reynolds, & Lynam, 2005; Miller et al., 2008) as a particularly innovative (for personnel theorists) and useful (for personnel practitioners) methodology to conceptualize and operationalize aberrant personality tendencies in the work context. In this regard, we also provide initial evidence for this methodology by concurrently and prospectively examining the validity of FFM aberrant tendencies for predicting a relatively broad range of career outcomes. As a fourth and final contribution, the usefulness of this methodology is evaluated when jointly considering (a) other relevant personality predictors (e.g., Big Five or ‘general’ Five-Factor Model traits), and (b) potentially relevant contextual predictors (i.e. specific employment characteristics).

From a Categorical to a Dimensional Conceptualization of Aberrant Personality

The categorical DSM-IV conceptualization of personality dysfunction departs from the assumption that abnormal personality is qualitatively different from normal personality: PD diagnoses are treated as distinct categories that may be identified when a patient meets a predefined threshold for symptom

pervasiveness and impairment. For narcissism, for example, the DSM lists 9 specific symptoms (e.g., “shows arrogant, haughty behaviors or attitudes”, “believes that he or she is ‘special’ and unique and can only be understood by, or should associate with, other special high-status people or institutions”). To be diagnosed as having narcissistic PD, an individual must have 5 of 9 of these symptoms. Importantly, however, narcissism must also cause distress or impairment before it can be diagnosed as a ‘disorder’. An individual can be haughty, lack empathy, exploit others, and have an inordinate sense of entitlement, but if he or she feels ok about him or herself, has reasonable relationships and functions at work reasonably well, this would not be considered as a narcissistic PD (Campbell et al., 2011). The result is that the prevalence of narcissistic PD is relatively low, while the prevalence of those with narcissistic tendencies (but without the sufficient stress to cross the line into the clinical disorder) is much higher (e.g., Stinson et al., 2008).

Recent developments in clinical psychology/psychiatry move away from this categorical perspective and PDs are now increasingly conceived as continua of personality tendencies (Clark, 2007; Van Leeuwen, Mervielde, De Clercq, & De Fruyt, 2007) that affect broad areas in people’s lives, including behavior at work (De Fruyt et al., 2009). It is in this perspective that researchers have extensively investigated the validity of general personality models, such as the FFM, to understand personality dysfunction, and studies have now demonstrated that (a) general and aberrant personality traits substantially overlap, and that (b) PDs can be described successfully using the FFM dimensions, suggesting that differences between normality and abnormality are quantitative rather than qualitative. A dimensional approach is valuable in organizational contexts as it also grasps more common occurrences of aberrant personality, i.e. at a subclinical level (Campbell et al., 2011; LeBreton, Binning, & Adorno, 2006). Further, the paradigm shift in which PDs are better understood as continua, together with the observation that general personality traits also capture core features of PDs, offers intriguing applications for I/O psychologists in terms of the assessment of aberrant personality tendencies.

Assessment of FFM Aberrant Personality Tendencies

The dimensional perspective on personality functioning has inspired clinical psychologists/psychiatrists to develop a set of alternative assessment tools. Lynam and Widiger (2001) first presented a prototype-matching technique in which FFM PD prototypes are generated through the use of expert ratings for all 10 DSM-IV PDs. These expert-generated prototypes, which use all 30 FFM facets, can then be matched to individuals' FFM profiles as assessed by the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992) through the use of an intraclass correlation. This correlation can then be used as an index of similarity to the pertinent PD constructs. A series of studies have now provided support for the convergent, discriminant, and predictive validity of the FFM PD prototypes (Miller, Pilkonis, & Morse, 2004; Miller, Reynolds, & Pilkonis, 2004; Trull, Widiger, Lynam, & Costa, 2003). Miller, Reynolds and Pilkonis (2004), for instance, reported median convergent correlations of .50 between FFM PD similarity scores and interview ratings of PD symptoms and .62 between the FFM PD scores and self-report ratings of PD symptoms.

Despite the empirical success of the prototype-matching technique, researchers and applied psychologists might be reluctant to use this approach (Miller et al., 2005). The scoring methodology is complex and requires a statistical program to create the PD similarity scores. In addition, the scores are not intuitively meaningful. As a response, Miller and colleagues (Miller et al., 2005; Miller et al., 2008) proposed a simplified technique for scoring DSM-IV PDs with the FFM. Through an easy-to-use linear combination of the most salient FFM facets, FFM compound scores are computed which reflect an individual's position on a compound of FFM facets, across Big Five domains, that are considered to be characteristic for a specific PD. The advantage of this technique is that it is grounded in the validated prototype technique (Lynam & Widiger, 2001), but at the same time has greater utility for practitioners who can now obtain aberrant personality trait scores through simple additive counts of FFM facets.

Miller and colleagues (2005) demonstrated that the more easily calculated counts perform as well in identifying aberrant personality as the similarity

scores that are generated by the prototype matching technique. It has, hence, been concluded that FFM profile similarity and FFM compound techniques are valid methodologies to screen for personality dysfunction in clinical contexts. In I/O settings, the validity of this dimensional approach to aberrant personality remains largely unexamined. De Fruyt and colleagues (2009) recently argued that the FFM PD compounds provide ways for I/O psychologists to screen for aberrant personality tendencies in the course of personnel selection, coaching, and career development questions. Using a selection sample, they specifically showed that all FFM compounds scales were significantly related to important criteria, including the final selection decision, the results of a behaviorally oriented selection interview and self-rated work competencies.

Although the use of FFM facet scores to obtain information on aberrant personality tendencies has been suggested in recent I/O literature on aberrant traits (e.g., Campbell et al., 2011; Wu & Lebreton, 2011), the present study is the first to empirically address the validity of FFM aberrant compounds for predicting a broad range of career outcomes. In accordance with the most recent proposal for DSM-5, we limited the number of compounds by only including the Antisocial, Narcissistic, Borderline, Schizotypal, Obsessive-Compulsive, and Avoidant tendencies. The Personality and Personality Disorder Work Group involved in the construction of DSM-5 made this selection of six aberrant traits on the basis of extensive literature reviews of their validity relative to other tendencies, retaining a limited set of constructs with maximal discriminant validity (Skodol, 2012; Skodol et al., 2011). Over the next sections, each of the six aberrant personality tendencies considered in this study are first described departing from the clinical PD which they stem from. From there, all constructs are framed specifically in the work context, and finally a summary of the key features, positive, and negative manifestations of the aberrant personality tendencies at work is presented in Table 1.

Antisocial Tendencies

The Antisocial Personality Disorder is defined by the DSM-IV as “a pervasive pattern of disregard for and violation of the rights of others” (APA,

2000). Seven criteria are proposed, including failure to conform to social norms, deceitfulness, impulsivity or failure to plan ahead, irritability and aggressiveness, reckless disregard for the safety of oneself and others, consistent irresponsibility and lack of remorse.

In I/O literature, these antisocial characteristics have more commonly been discussed and investigated using the label ‘psychopathy’ (e.g., O’Boyle et al., 2012; Wu & Lebreton, 2011). Psychopathy is marked by a lack of concern for both other people and social regulatory mechanisms, impulsivity, and a lack of guilt or remorse when their actions harm others (O’Boyle et al., 2012). There is now growing consensus in clinical/psychiatric literature that psychopathy and antisocial PD substantially overlap. Decuyper, De Pauw, De Fruyt, De Bolle, and De Clercq (2009), for instance, meta-analytically demonstrated striking similarities between both aberrant tendencies in terms of associations with FFM facets, and that the difference between both was quantitative rather than qualitative in nature. Because psychopathy has received much more attention in the I/O literature, findings regarding this aspect of the dark triad were used to briefly summarize the importance of the antisocial personality tendency with regard to relevant organizational behavior.

Inspection of the literature on antisocial or psychopathic traits in organizational contexts first indicates that much of this work is restrained to conceptual discussions, descriptive statistics, and anecdotal evidence (e.g., Babiak, 1995; Babiak & Hare, 2007; Boddy, 2006; LeBreton et al., 2006; Van der Graaf, 2007; Wu & Lebreton, 2011). A recurrent theme is the proposed tendency of organizational psychopaths to rise to high corporate positions. Organizational psychopaths have been argued to be more motivated and better equipped than other corporate managers to climb the corporate ladder. They are more motivated because they crave the power and prestige that go with senior managerial positions and they are better equipped because they lack a genuine concern for others, are ruthless and prepared to lie, and sometimes can present a charming façade and appear to be an ideal leader (Boddy, 2006). In support of this, Babiak and Hare (2007) reported that 3.5% of top corporate executives earn very high scores on standard measures of psychopathy, which is considerably

higher than the frequency found in the general population (1 percent). It seems that some individuals with psychopathic tendencies prosper in business and corporate settings, particularly if the work requires a rational, emotionless behavioral style; a consistent focus on achievement; a willingness to take risks; and the social skills of the charismatic (DePaulo, 2010; Yang & Raine, 2008), such as in some leadership positions or highly competitive branches.

In his conceptual paper, Boddy (2006) discusses a list of 14 negative organization-level outcomes associated with the presence of organizational psychopaths in managerial roles, going from disheartened workforce to corporate failure. At the level of individual work behavior, Wu and LeBreton (2011) summarized several theoretical arguments that link psychopathy to higher levels of counterproductive work behaviors. Specifically, the belief that common norms and rules do not apply to them and the inability to take responsibility for their own actions may lead those high in psychopathy to engage in counterproductive work behaviors to a greater extent compared to nonpsychopaths. Furthermore, disincentives such as being caught may not be a legitimate threat to psychopaths because they do not experience guilt or consider the consequences of their actions (Wu & Lebreton, 2011).

Despite these strong theoretical indications for negative effects of antisocial or psychopathic characteristics on workplace behavior, relatively little empirical work is available that supports these assertions. Moscoso and Salgado (2004) found a risky personality style, which was assumed to be conceptually related to antisocial personality disorder, to correlate negatively with task, contextual, and overall job performance. More recently, O'Boyle and colleagues (2012) reported significant meta-analytic correlations between psychopathy and job performance ($r_c = -.10$) and counterproductive work behavior ($r_c = .07$), although these were relatively small. These authors concluded that the extant literature suggests that psychopathy is not a particularly powerful predictor of these two work behaviors.

Narcissistic Tendencies

Narcissistic personality disorder refers to an enduring and inflexible character structure associated with grandiosity, lack of empathy and a desire for admiration. Individuals with narcissistic traits exhibit feelings of entitlement, believing that they should receive special privileges and respect, even though they have done nothing in particular to earn that special treatment. People with this personality are extremely demanding for those surrounding them. They must receive regular praise and even devoted admiration from those close to them (Larsen & Buss, 2005). The narcissist is also characterized by an inability to recognize the needs and desires of others, which results in (often numerous) shallow relationships that can range from exciting and engaging to manipulative and exploitative. Much of their behavior is directed at maintaining or boosting their inflated self-image. As an example, narcissists also have a strong need to dominate others.

Despite the prominence of narcissism in psychological theory and the renewed attention for aberrant personality traits in conceptual reviews (Campbell et al., 2011; Wu & Lebreton, 2011), relatively little empirical work has been done on narcissism in current organizational behavior research (e.g., Judge, LePine, & Rich, 2006; Resick et al., 2009). As Campbell and colleagues (2011) recently put it: “the single most important theme in research on narcissism in organizations is that there is more research needed” (p. 281).

In the work context, narcissism has mostly been discussed in relation to leadership (e.g., Chatterjee & Hambrick, 2007; Galvin, Waldman, & Balthazard, 2010; Judge et al., 2006; Kets de Vries & Miller, 1997; Maccoby, 2003; Resick et al., 2009). Although studies have indeed indicated a heightened propensity for narcissists to emerge as leaders (Brunell et al., 2008; Paunonen, Lonqvist, Verkasalo, Leikas, & Nissinen, 2006), there is still debate about the aptitude of narcissistic leaders to perform effectively in these positions (for an overview see Campbell et al., 2011). One relevant paper in this context by Galvin, Waldman, and Balthazard (2010) helps clarify the up- and down-sides of narcissism in relation to leadership, and the specific mechanisms through which this aberrant tendency has its effects.

Mixed evidence further comes from Moscoso and Salgado (2004) who found the egocentric personality style, which was assumed to be conceptually related to narcissism, to be unrelated to supervisor ratings of task and overall job performance. These authors did, however, identify a significant negative relationship with supervisor ratings of contextual performance. Finally, Penney and Spector (2002) and Judge et al. (2006) also found narcissism to be positively related with counterproductive work behavior.

Borderline Tendencies

The borderline personality disorder is defined as “a pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present in a variety of contexts” (APA, 2000). Individuals with borderline personality disorder often have highly volatile relationships characterized by periods of adoration or idealization followed by suspicion and coldness. They are also described as being extremely impulsive as well as having very unstable emotional states. These features, in combination with an unsteady sense of identity, often lead them to make irrational choices that are self-damaging.

In contrast with the relatively high prevalence of this personality disorder (Trull, Ueda, Conforti, & Doan, 1997), strikingly few attempts have been made to document the consequences of borderline characteristics in work settings. Borderline personalities may present as moody, insecure, highly emotionally unstable, irritable, and occasionally hostile (De Fruyt et al., 2009); behaviors that are potentially disruptive in employment settings. Other common work-related problems in borderline individuals that have been suggested include a lack of satisfaction with work, unrealistically high expectations of perfection for themselves, avoidance/procrastination, and overall poor work habits (Salz, 1983).

Zanarini, Frankenburg, Hennen, Reich, and Silk (2005) prospectively examined psychosocial functioning of clinical borderline patients over a six-year time interval. They concluded that borderliners functioned significantly more poorly, particularly in the area of vocational achievement. They were less likely

to sustain employment and to overall perform well at work. A recent study by Thompson, Payne, Horner and Morey (2012) was the first to demonstrate negative work-related effects of borderline characteristics in a nonclinical sample. In a sample of psychology students, these authors found borderline personality to relate negatively to the generation of task strategies, which in turn resulted in lower task performance. Clearly, additional research is needed to understand how subclinical borderline tendencies affect *actual* career outcomes in *working* populations.

Schizotypal Tendencies

The Schizotypal personality disorder is characterized by a need for social isolation, odd behavior and thinking, and unconventional beliefs. The Schizotypal individual is uncomfortable and anxious in social situations, especially if those involve strangers. Another characteristic of individuals with schizotypal personalities is that they are odd and ultimately eccentric in their way of thinking and in their behaviors.

Because of their suspiciousness of others, social discomfort, and general oddness, schizotypal persons may encounter severe difficulty with social relationships, including those at work. Further, it has been suggested that schizotypal personalities may suffer from cognitive disorganization and have an elevated risk of decompensating under stress (De Fruyt et al., 2009). Despite these indications for disrupted functioning at work, only very little research has examined the effects of schizotypal characteristics in work contexts. Moscoso and Salgado (2004) found the eccentric personality scale, which is supposed to be conceptually related to the schizotypal personality disorder, to relate negatively to task, contextual and overall job performance. More recently, Burch and Foo (2010) focused on the uncommon and imaginative facets of the schizotypal personality and hypothesized positive effects regarding employee creativeness. As predicted, these authors found schizotypal personality characteristics, measured by the Imaginative scale of the Hogan Development Survey (HDS; Hogan & Hogan, 2001), to positively predict managerial performance ratings of creativity.

Obsessive-Compulsive Tendencies

The obsessive-compulsive personality disorder is characterized by “a pervasive pattern of preoccupation with orderliness, perfectionism, and mental and interpersonal control at the expense of flexibility, openness, and efficiency” (APA, 2000). Obsessive-compulsive persons hold very high standards for themselves and expect a similar attitude from others. Because of their perfectionist and inflexible nature, they are often reluctant to delegate tasks (Larsen & Buss, 2005).

At work, individuals with strong obsessive-compulsive tendencies can be described as ‘workaholics without warmth’ (Furnham & Taylor, 2004), as they may be overly controlled emotionally. Individuals with these traits are formal and perfectionist, and they value productivity and achievement over social attachment (De Fruyt et al., 2009). However, they may work so hard at being perfect that they are never satisfied with their output, which may result in lower productivity. In terms of team functioning, obsessive-compulsive employees may experience severe trouble working with others because of their unwillingness to delegate tasks. Finally, they can become irritated when others take their work less seriously than they do (Larsen & Buss, 2005).

Ettner and colleagues (2011) found individuals with obsessive-compulsive PD to have a higher risk for encountering trouble with a boss or coworker. It is still not clear, however, how and to what extent these results generalize to more subclinical emergences of obsessive-compulsive characteristics. Moscoso and Salgado (2004) found no significant associations between a reliable personality style, which is conceptually related to the obsessive-compulsive personality disorder, and any of the three performance outcomes (task, contextual, and overall).

Avoidant Tendencies

Finally, the avoidant personality disorder is characterized by “a pervasive pattern of social inhibition, feelings of inadequacy, extreme sensitivity to negative evaluation, and avoidance of social interaction” (APA, 2000). People with avoidant personality tendencies often consider themselves to be socially

inept or personally unappealing and avoid social interaction for fear of being ridiculed, rejected or disliked. Because avoidant persons fear criticism, they restrict their activities to avoid potential embarrassments. They specifically go great lengths to avoid situations in which others may have opportunities to criticize their performance, such as in school, at work, or in other group settings (Larsen & Buss, 2005).

Although these descriptions suggest severe problems regarding professional development, avoidant personality tendencies have also received only limited attention in organizational behavior literature. Moscoso and Salgado (2004) found a shy personality style, which was assumed to be conceptually related to the avoidant personality disorder, to correlate negatively with task and contextual performance. Finally, Khoo and Burch (2008) found the 'Cautious' scale of the HDS (2001) to be a negative predictor of transformational leadership in a sample of chief executives and senior managers.

Research Objectives and Hypotheses

A key feature of aberrant personality is that it is stable and of long duration, with onset traceable back to early adulthood (APA, 2000). A validation of FFM aberrant compounds in the work context, intended to tap aberrant personality tendencies at a subclinical level, should therefore also include a longitudinal component and young adulthood seems an appropriate life stage to test potential effects of aberrant personality on career unfolding. The present study expands upon the extant research by exploring the stability of the FFM aberrant personality tendencies in a longitudinal sample of undergraduates entering the labor market and examines their ability to predict a broad range of extrinsic (objective) and intrinsic (subjective) career outcomes. Specifically, the present study is centered around three main research questions:

- (1) Are FFM aberrant compounds stable over time?*
- (2) Are FFM aberrant compounds, developed to assess subclinical personality tendencies, valid predictors of career outcomes in a sample of college alumni?*

(3) Are FFM aberrant compounds, which are alternative combinations of FFM facets, important predictors of these outcomes when FFM general traits (i.e. Big Five traits) are also taken into account?

Stability in FFM aberrant personality tendencies. The first research question concerns the long term temporal stability of FFM aberrant compound scores. The DSM has noted that personality dysfunction may be particularly problematic in organizations, because it reflects personality traits that are enduring and long-lasting patterns of aberrant behavior, rather than a more transient or episodic emotional problem (APA, 1994). Given that the FFM aberrant compounds are linear combinations of FFM facets, it is assumed that they will show considerable stability and similarly high stability coefficients (Robins, Fraley, Roberts, & Trzesniewski, 2001). Relying on the meta-analytic results reported by Roberts and DelVecchio (2000) for this particular age group, test-retest correlations around .50, uncorrected for reliability, are to be expected.

Hypothesis 1: All FFM aberrant compounds will show stability coefficients equal or higher than .50 across a 15-year time span.

FFM aberrant personality tendencies and career outcomes. The central research question of the present study concerns the validity of FFM aberrant personality tendencies to predict work-related outcomes. We choose to incorporate a relatively broad spectrum of career outcomes as our literature overview indicates that these aberrant tendencies may have differential effects depending on the criteria that are considered. Consistent with prior research on the dispositional source of career outcomes (e.g., Judge, Higgins, Thoresen, & Barrick, 1999; Rode, Arthaud-Day, Mooney, Near, & Baldwin, 2008; Seibert & Kraimer, 2001), we include extrinsic (i.e. salary, number of subordinates, management level) as well as intrinsic (i.e. job satisfaction, career satisfaction, perceived job stress) outcomes in this study. Although certain outcomes, such as job satisfaction and perceived job stress, are typically not considered as *career* outcomes, this seems nonetheless warranted given the design of our study. Specifically, work outcomes are collected in a cohort of college alumni that

graduated and entered the labor market at about the same time. Since then, each of them has had the opportunity to accumulate career experiences and eventually to ‘gravitate’ toward jobs that fit their needs. For this cohort of alumni, levels of job satisfaction and perceived job stress 15 years after graduation can, hence, be considered as career outcomes at that specific time point; much like current salary level, which is de facto also connected with a specific job but in career literature typically considered as the result of the accumulation of various work experiences (and associated financial outcomes) over time.

Drawing on our literature overview, specific hypotheses can be formulated regarding the predictive validity of some of the FFM aberrant tendencies, and we hereby use the career success model by Judge and Kammeyer-Mueller (2007) as a guiding framework. Accordingly, there are at least two behavioral mechanisms through which personality traits may affect career outcomes. Traits are first expected to influence *individual performance* on the job (task performance, citizenship behavior, and counterproductive behavior) in a way that will lead to higher extrinsic outcomes including higher compensation, new job responsibilities, and promotions into higher organizational ranks. A second, related, mechanism concerns *social behavior*, referring to the potentially beneficial effects of building and sustaining social relationships at work or in work contexts. Finally, it is also described that traits directly shape the *subjective perception* of job characteristics, which is in turn reflected in intrinsic career outcomes. Building on these three general mechanisms, a number of specific predictions can first be made concerning the effects of Borderline, Schizotypal, and Avoidant FFM aberrant personality tendencies on career outcomes.

First, these three aberrant tendencies have in common that they negatively impact on how the individual interacts with others (*Borderline*: impulsively, angrily and/or emotionally deregulated; *Schizotypal*: odd/uncomfortably; *Avoidant*: inhibited, anxiously for criticism). Given these detrimental effects on interpersonal functioning, these three aberrant personality tendencies are expected to be negatively related to extrinsic career outcomes that reflect higher levels of interpersonal contact, such as number of subordinates under

supervision and acquired management level. Further, given the preliminary evidence that Borderline, Schizotypal and Avoidant tendencies are also negatively related to job performance (Moscoso & Salgado, 2004; Thompson et al., 2012), negative associations can also be expected with income levels. We hereby draw on research indicating that pay is indeed -at least in part- predicted by job performance (e.g., Ng & Feldman, 2010). The following hypothesis can thus be proposed:

Hypothesis 2a: The Borderline, Schizotypal, and Avoidant FFM aberrant personality tendencies will be negatively correlated with extrinsic career outcomes (i.e. number of subordinates, acquired management level, and salary).

Second, the Borderline, Schizotypal, and Avoidant aberrant personality tendencies share that they involve varying degrees of emotionality and that they are associated with negative affect (Saulsman & Page, 2004). Drawing on research that indicates a direct effect of these affective dispositions on (the perception of) job and career characteristics (e.g., Necowitz & Roznowski, 1994), these three personality tendencies can be expected to be negatively associated with intrinsic career outcomes. The following hypothesis can thus be proposed:

Hypothesis 2b: The Borderline, Schizotypal, and Avoidant FFM aberrant personality tendencies will be negatively correlated with career satisfaction and job satisfaction, and positively with perceived job stress.

For the three other aberrant personality tendencies, the hypothesized associations with different career outcomes are less equivocal. Although there is evidence suggesting that Antisocial characteristics are valued in high status jobs (e.g., Babiak & Hare, 2007; Van der Graaf, 2007), the DSM definition of this particular aberrant tendency explicitly mentions a marked inability to get along with others, which may be detrimental at work. Furthermore, subclinical antisocial traits have been described to manifest at work through an increased likelihood of counterproductive work behaviors (e.g., Wu & Lebreton, 2011). In

a similar vein, narcissism has been identified as a hallmark of many high-achieving, ambitious people (Yudofsky, 2005), but at the same time narcissists cause great emotional harm to others and also risk a greater likelihood to engage in counterproductive work behaviors (e.g., Campbell et al., 2011). Finally, the Obsessive-Compulsive personality tendency is to a large extent defined by facets of Conscientiousness, a trait that has consistently been shown to positively predict work performance (Barrick & Mount, 1991). Yet, on the other hand Ettner and colleagues (2011) found the Obsessive-Compulsive personality disorder to be among the conditions most often associated with adverse work outcomes such as experiencing problems in interactions with coworkers and bosses. Based on these conflicting indications, no a priori hypotheses are formulated regarding the effects of Antisocial, Narcissistic, and Obsessive-Compulsive FFM aberrant personality tendencies on career outcomes. These effects will therefore be examined on exploratory grounds.

Importantly, the Judge and Kammeyer-Mueller (2007) model also mentions employment characteristics (i.e. *Jobs held*) as a relevant factor to account for when examining trait-outcome associations. Research has indeed indicated that FFM general personality traits interfere in choices regarding academic major type (e.g., Lakhal, Frenette, Sévigny, & Khechine, 2012) and status and nature of employment (De Fruyt & Mervielde, 1999), and that such characteristics may influence career outcomes. In a sample of undergraduate business, MBA, and engineering school alumni, Seibert and Kraimer (2001) for instance found individuals in ‘people occupations’ to report higher salary levels, more promotions, and higher levels of career satisfaction compared to alumni occupying jobs with a less prominent interpersonal dimension.

Until now, it has not yet been examined how FFM aberrant personality tendencies might affect specific employment characteristics and how these, in turn, might relate to relevant career outcomes. A cautious approach was therefore adopted in this study to account for employment (e.g., part-time versus full-time) and job characteristics. The potential side-effect of controlling for these variables is that relevant variation in these career outcomes is cancelled out; variation that may -at least in part- also be attributable to (indirect effects

of) personality tendencies. Consider, for instance, the subclinical borderliner who chooses only to take on a part-time job because full-time employment causes him/her too much stress. For this employee, the lower income level associated with part-time employment clearly relates to his/her personality tendencies. As another example, it may well be that more narcissistic individuals select themselves and are selected into occupations with stronger interpersonal components, jobs which are generally valued higher on intrinsic and extrinsic criteria in highly educated populations (e.g., Seibert & Kraimer, 2001). Outcomes potentially associated with narcissistic characteristics, including hierarchical attainment and career satisfaction, may, hence, be partially occupation specific. At least, these examples indicate that the effects of (aberrant) personality tendencies are subtle and complex, and that labeling employment and occupational characteristics as merely ‘confounding factors’ may be an oversimplification.

In order to deal with this complexity, the validity of FFM aberrant personality tendencies for predicting career outcomes was examined both with and without taking these control variables into account. Although the inferences drawn from both sets of analyses are quite different, they can both be considered valuable. As the examples above illustrate, whereas the ‘uncontrolled’ analyses address the bottom question of whether and how aberrant personality tendencies direct people’s occupational careers and associated outcomes (e.g., *Do more narcissistic individuals gravitate toward higher extrinsically rewarded employment settings?*), controlled analyses address questions concerning the effects of aberrant tendencies on occupational functioning cancelling out differences attributable to specific employment characteristics (e.g., *Do narcissistic individuals attain higher managerial levels across different employment settings?*). Both kinds of questions are highly relevant to further validate FFM aberrant personality compounds in the work setting.

Relative importance of FFM general and FFM aberrant tendencies. A final aim of this study concerns the question whether these FFM aberrant personality tendencies are important predictors of career outcomes when FFM general traits are also taken into account. One definition of variable importance

emphasizes the incremental validity of the new measure(s). Incremental importance is valuable because it ensures that the variable(s) of interest is/are tapping unique variance in the criterion variable above and beyond that of other variables in the regression model (LeBreton, Hargis, Griepentrog, Oswald, & Ployhart, 2007; Sechrest, 1963). This incremental validity analysis is a first important step in determining whether FFM aberrant personality measures can contribute to the ‘bag of tools’ of the HR professional.

To the best of our knowledge, there is only one study that has explicitly examined whether aberrant personality traits explained relevant outcomes beyond general traits in a work related context. Specifically, Rolland and De Fruyt (2003) tested whether aberrant traits were incrementally valid in predicting negative emotions experienced at work in military personnel. Although main effects of aberrant traits were found, the incremental validity analysis revealed non-significant effects. Clearly, more research is needed to understand if and when aberrant personality tendencies contribute to the prediction of relevant work outcomes beyond general traits (see also Moscoso & Salgado, 2004). Given the relatively unprecedented though fundamental nature of this research question, this study exploratively examines whether FFM aberrant tendencies show incremental validity in the prediction of extrinsic and intrinsic career outcomes beyond FFM general traits.

Further, although I/O psychologists mostly try to avoid introducing new predictor variables that are too highly correlated with existing variables, there are some instances in which empirical overlap between existing and new predictor variables is inevitable (LeBreton et al., 2007). In the case of the present study, overlap between ‘new’ (i.e. FFM aberrant tendencies) and ‘existing’ (i.e. FFM general tendencies) predictors is inherent to the dimensional perspective on personality functioning, and moreover supported by a substantial amount of clinical literature revealing significant associations between PDs and general personality functioning. Saulsman and Page (2004), for example, meta-analytically demonstrated that each of the six PD constructs included in the present study show associations with the FFM that are meaningful and predictable given their individual distinctive features. Disorders particularly

characterized by emotional distress (i.e. Borderline, Schizotypal, and Avoidant) showed positive associations with Neuroticism. Narcissistic disorder, which is particularly characterized by gregariousness showed positive associations with Extraversion, while those particularly characterized by shyness and reclusive qualities (i.e. Schizotypal and Avoidant) show negative associations with Extraversion. Disorders particularly associated with interpersonal difficulties (i.e. Schizotypal, Antisocial, Borderline, and Narcissistic) show negative associations with Agreeableness. Finally, the Obsessive-Compulsive disorder, which is particularly characterized by orderliness, shows positive associations with Conscientiousness, in contrast to those particularly characterized by recklessness (i.e. Antisocial and Borderline), which show negative associations with Conscientiousness.

In the incremental validity analysis described above, any criterion variance predicted by both the new variable(s) and the existing set of variables is automatically ‘credited’ toward the latter. Thus, an incremental validity analysis might lead one to make incorrect or misinformed decisions about the relative efficacy of the new variable(s). It is well possible that these new variable(s) yield relatively small increments in prediction but that the overall contribution that this/these variable(s) make(s) to the R^2 is as high (or higher) than the other predictors in the model (LeBreton et al., 2007). In order to provide additional evidence for the validity of FFM aberrant personality tendencies, it is additionally explored whether these trait compounds contribute substantially to the model R^2 when taking FFM general traits into account.

Method

Design and Participants

The present study is part of a longitudinal research program on personality and career unfolding in a Flemish undergraduate alumni sample. In February-March 1994 (Time 1; T1), 934 final year college students from various faculties enrolled in this research program and completed personality questionnaires three months prior to graduation. In the spring of 2009 (Time 2; T2), a follow-up of

this sample was conducted with the main purpose of investigating college alumni career progression over this substantial and pertinent time interval.

Previous studies have used data from this research project to illustrate the importance of FFM general traits regarding initial job choice (De Fruyt & Mervielde, 1999), early career work adjustment (De Fruyt, 2002), career transitions (Wille, Beyers, & De Fruyt, 2012; Wille, De Fruyt, & Feys, 2010), and work-family conflict (Wille, De Fruyt, & Feys, 2012). The present investigation is the first to focus on the predictive validity of aberrant personality tendencies, gathered at participants' career start, for intrinsic and extrinsic work outcomes measured 15 years later.

Given the large time span between assessment points, the first step in organizing the follow-up study consisted of tracing all research participants by sending letters to all 934 home addresses that were registered 15 years ago. The letter contained a brief description and history of the overall research project, and the present study was framed within the context of a professional career follow-up organized by the educational institute they graduated from 15 years ago. Recipients of the letter were asked to provide all relevant information concerning the addressee, such as current email address, home address, and telephone number by letter (a stamped envelope was included). Four weeks later, a reminder was sent to those addresses that had not reacted on the initial letter. In total, 590 subjects (63.17%) responded to this mailing and provided a valid email address. For subjects that could not be reached with this mailing procedure, an alternative search was organized. Their names were entered in an online search engine (Google) and alternatively screened via social and professional network sites as Facebook, Netlog, Plaxo Pulse and LinkedIn. This online search traced 60 additional subjects, bringing the total number on 650 potential participants, which is 69.59% of the entire 1994 sample.

Each participant was subsequently sent an email containing further information on the research project with a request to continue participation. Three internet links were provided at the bottom of the document, each connecting with a separate survey module. Variables from all three modules were used for the present study. The first module concerned re-assessing

participants' personality and further asked about a number of demographic transitions over the past 15 years. In module 2, descriptive information on their current work situation (i.e., type of employment and sector of employment) was gathered along with a reconstruction of participants' professional career mobility over the past 15 years (see Wille et al., 2010). Finally, a third module focused on extrinsic and intrinsic career outcomes. Response rates varied over and within each of the three survey modules.

For the present study we included 247 participants (129 men and 118 women) who -in addition to valid personality reports in 1994 and 2009- also provided information on type of employment and at least one indicator of career success. Although the alumni included in this study are homogeneous in terms of education level, the sample is at the same time heterogeneous in terms of educational specialty with alumni from a broad range of college faculties representing alpha sciences (Philosophy, History, and Languages; $N = 43$), beta sciences (Industrial Engineering, Sciences, Applied Sciences, and Applied Biological Sciences; $N = 110$), and gamma sciences (Economics, Law, Political and Social Sciences, and Psychology and Educational Sciences; $N = 94$).

In order to get a sense of the type of vocations participants have pursued, O*NET's job codes (see below) were analyzed in terms of Holland's (1985, 1997) major interest fields. For each occupation, O*NET provides a two- or three-letter interest code, with the first letter indicating the primary Holland interest dimension characteristic for that occupation. Inspection of these interest codes indicates that the sample shows a strong orientation towards primarily Enterprising occupations (54.7%). Other participants occupy primarily Investigative (17.8 %), Social (14.2%), and Conventional (8.9%) occupations. Only a small minority has pursued primarily Artistic (2.8%) or Realistic (1.6%) vocations.

Measures

Personality. At both T1 and T2, participants were administered the Dutch authorized adaptation of the NEO PI-R (Costa & McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996). The NEO PI-R is a comprehensive personality

questionnaire consisting of 240 items that measure 30 specific traits (i.e. eight items per NEO PI-R facet). Internal consistency (Cronbach alpha) of these NEO PI-R facets ranged from .59 (C1: *Competence*) to .85 (N1: *Anxiety*) at T1, and from .60 (O6: *Values*) to .87 (N1: *Anxiety*; O1: *Fantasy*) at T2. In the present study, this facet level information is combined in two different ways. First, as is described in the NEO PI-R manual (Costa & McCrae, 1992), facet scores at both personality assessments were aggregated into five higher order domain level traits, intended to measure *FFM general (Big Five) traits*. A description of NEO PI-R facets and FFM general traits is provided in Appendix A. Second, NEO PI-R facet scores were used to compute six *FFM aberrant compound scores* for both measurement occasions, following the procedures outlined by Miller and colleagues (Miller et al., 2005; Miller et al., 2008). Specifically, all six FFM aberrant compounds were obtained by means of a specific linear combination of facet scores *across* FFM general traits. For example, the Schizotypal tendency is defined as a linear combination of seven facets of the NEO PI-R, i.e. N1: *Anxiety* + N4: *Self consciousness* + E1: *Warmth* (reverse-scored) + E2: *Gregariousness* (reverse-scored) + E6: *Positive emotions* (reverse-scored) + O5: *Ideas* + C2: *Order* (reverse-scored). An overview of the scoring rules for the six aberrant compounds is presented in Appendix B.

Facet level Cronbach alpha coefficients were inspected to examine the degree of internal consistency in FFM general traits and FFM aberrant compounds. For FFM general traits, alpha's ranged from .73 (Openness) to .82 (Conscientiousness) at T2, and from .67 (Openness) to .82 (Conscientiousness) at T1. Compound traits vary, by definition, in the degree to which the constituting variables are interrelated (Hough & Schneider, 1996), resulting in lower levels of internal consistency. Facet level alpha coefficients of FFM aberrant compounds in the present study ranged from .61 (Schizotypal) to .77 (Avoidant) at T2, and from .60 (Schizotypal) to .78 (Avoidant).

Finally, to test for selectivity in dropout, baseline (T1) personality scores of continuers ($N = 247$) were compared with those of the dropouts ($N = 687$). Facet level analyses indicated that continuers scored significantly higher on O5: *Ideas* ($F(1,932) = 5.47, p < .05$) and C3: *Dutifulness* ($F(1,932) = 3.88, p < .05$)

compared to dropouts, but associated effect sizes were small ($d = .17$ and $.15$ respectively). Linear combinations of FFM facets, both in terms of FFM general traits *and* in terms of FFM aberrant tendencies showed no significant mean-level differences between both groups.

Extrinsic career outcomes. Three different extrinsic career outcomes were evaluated at the Time 2 assessment: income, the number of persons under supervision, and the managerial level of their current job. These three variables have been used in other longitudinal occupational studies as markers of extrinsic career success (Judge et al., 1999). Monthly salary before taxes, management level, and number of subordinates were measured by means of twelve, five and six response categories, respectively. Based on distribution characteristics and following the guidelines by Cohen, Cohen, West and Aiken (2003), it was decided that income should be log-transformed which resulted in a measure closer to the normal distribution (*Skewness* = $-.22$ and *Kurtosis* = 1.54).

Intrinsic career outcomes. The 2009 assessment also asked participants to evaluate satisfaction with their current job as well as their entire career (spanning 15 years). *Job satisfaction* was measured using the 21-item Job Satisfaction Scale of the Career Attitudes and Strategies Inventory (CASI; Holland & Gottfredson, 1994). Example items include: ‘I love my job’, ‘My job provides me a feeling of accomplishment’, and ‘My job does not lead to anything I want’ (reverse-scored). *Career satisfaction* was assessed with the five-item Career Satisfaction Scale developed by Greenhaus, Parasuraman, and Wormley (1990). Example items are: ‘I am satisfied with the success I have achieved in my career’, ‘I am satisfied with the progress I have made towards meeting my overall career goals’, and ‘I am satisfied with the progress I have made towards meeting my goals for income’. In addition to these satisfaction measures, participants also rated *perceived job stress* in their current job on a set of 7 items (see also De Fruyt, 2002). The items of the perceived job stress scale appear in Appendix C. All satisfaction and stress items were presented as declarative statements to which respondents responded on a five-point scale ranging from *totally false* (1) to *totally true* (5).

Control variables. A set of seven control variables were included, accounting for demographic, employment, and occupation-level characteristics. *Gender* was coded 1 for men and 2 for women, and two dummy variables were used to account for differences in *educational background* (alpha, beta, and gamma sciences). Employment characteristics included *employment type* (1 = part-time and 2 = full-time) and *sector of employment* (1 = profit and 2 = non-profit sector). Finally, three occupation-level characteristics were considered that were derived from participants' job descriptions. For this purpose, participants' T2 occupations were first recoded into O*NET's job codes, using all descriptive information available on their current employment situation at that time, including employment sector, managerial level, number of subordinates, and responses on two open-ended questions asking participants to report (a) their job title and (b) a thorough description of their work content. Based on these descriptors, each respondent was assigned one O*NET job code, from which three occupational characteristics were derived. *Job complexity* was determined based on ratings of preparation requirements for each occupation provided by O*NET (see also Le et al., 2011). O*NET classifies all jobs into five "job zones" based on levels of experience, education, and training required to do the work (1 = little or no preparation needed; 5 = extensive preparation needed). The distribution of the sample across all five job zones indicates that most participants are employed in occupations that require medium (17.8%), considerable (52.6%), or extensive (23.9%) preparations. Only a small minority (5.7%) occupied jobs that only require "some" preparation (i.e., job zone 2). Besides job complexity, O*NET information was also used to assess two important aspects of job content. Two generalized work activities (GWA) were selected for this purpose, i.e. constructs that describe similarities and differences across occupations in terms of critical work activities (Morgeson & Humphrey, 2006; Peterson et al., 2001). The *information/data processing* dimension indexes the extent to which jobs involve working with information/data. Occupations such as financial analyst, architect, market analyst, and software developer typically involve many data-oriented activities. *Communicating/interacting* GWA assesses the extent to which the jobs involve working with others. In

general, occupations such as sales, community service manager, counseling psychologist, and human resources manager involve a high level of communication/interaction with other people. Research has demonstrated the reliability and validity of these GWA measures (Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1999; Peterson et al., 2001). With these GWA, we covered two of the three fundamental dimensions underlying work (i.e. *Data* and *People*) outlined by Functional Job Analysis (FJA; Fine, 1968; Fine & Cronshaw, 1999). The third dimension, i.e. *Things*, was considered less relevant for this sample of highly educated college alumni, of which only a small minority (i.e. 1.6%) had pursued Realistic vocations that principally require manipulation of things (Holland, 1985). All variable intercorrelations and internal consistencies (if applicable) are reported in Table 2.

Analytical Considerations

An important caveat in examining the validity of FFM aberrant compounds concerns the interrelatedness of various trait scales. Theoretically, FFM aberrant tendencies are conceptualized as related rather than independent clinical constructs, as illustrated by the fact that the personality disorders which they stem from are organized into three overarching clusters in the DSM-IV. Prevalence numbers have indeed indicated high levels of co-morbidity among PDs, especially among those categorized in the same cluster (e.g. the narcissistic and the antisocial PD). Further, interrelatedness of FFM aberrant compounds is empirically inevitable as they are partly the result of shared underlying facet scores, resulting in relatively high intercorrelations ($> .60$). This issue of correlated predictors imposes problems of multicollinearity, which makes it highly undesirable to examine their separate effects in a multivariate manner, such as through multiple regressions. Instead, the validity of separate FFM aberrant personality tendencies to predict career outcomes was primarily examined through partial correlations (see Table 3). To correct for the large number of comparisons, a more stringent significance level ($p < .01$) was adopted for these particular results. In order to disentangle the relative importance of each of the six correlated aberrant personality tendencies for

predicting career outcomes, relative weight analyses (Johnson, 2000; LeBreton, Binning, Adorno, & Melcher, 2004) were also performed, as is recommended by LeBreton and colleagues (2007). Relative weight analysis furnishes meaningful estimates of variable importance in the presence of multicollinearity; standardized regression weights and other traditional statistics are inadequate under this condition (Johnson & LeBreton, 2004; LeBreton et al., 2007).

Results

Preliminary Analyses

Before addressing our central research questions, we first inspected how different control variables related to the career outcomes and to the FFM aberrant personality tendencies (Table 2). Results indicate that all of the seven control variables were significantly related to at least one career outcome. Gender predicted financial and hierarchical attainment, with men reporting higher salary levels ($d = .78, p < .001$), a larger number of subordinates ($d = .51, p < .001$), and higher managerial levels ($d = .52, p < .001$) compared to women. The significant correlations between extrinsic outcomes and both dummy variables coding for educational background also indicated significant differences between participants representing alpha, beta and gamma sciences. A oneway ANOVA revealed significant between-group differences with regard to income ($F(2,229) = 11.10, p < .001$), number of subordinates ($F(2,238) = 6.67, p < .01$), and management level ($F(2,238) = 5.32, p < .001$). Post-hoc pairwise comparisons (LSD) revealed consistent results across the different career outcomes: participants representing alpha sciences reported significantly lower salary levels compared to those from beta ($d = .84, p < .001$) and gamma ($d = .54, p < .01$) sciences, had a smaller number of subordinates compared to those from beta ($d = .73, p < .001$) and gamma ($d = .66, p < .01$) sciences, and occupied lower managerial functions compared to those from beta ($d = .62, p < .01$) and gamma ($d = .53, p < .01$) sciences. We also found some effects of employment characteristics on extrinsic career outcomes. Full-time employed participants reported higher salary ($d = 1.50, p < .001$) and management ($d = .80, p < .001$) levels, more subordinates ($d = .81, p < .001$), and higher levels of

job satisfaction ($d = .41, p < .05$) compared to part-time employed individuals. In addition, higher salary levels were found for participants employed in profit sector jobs compared to those working in non-profit environments ($d = .64, p < .001$). Regarding occupation-level characteristics, results first indicate that the overall level of job complexity is negatively associated with the number of subordinates ($r = -.17, p < .01$) and positively with career satisfaction ($r = .16, p < .05$). Concerning specific work activities, Information/Data was positively related to income ($r = .18, p < .01$) and Communication/Interaction was positively related to number of subordinates ($r = .16, p < .05$) and management level ($r = .18, p < .01$).

Turning to FFM aberrant personality tendencies, the results in Table 2 first indicate relatively high cross-time stability coefficients for all six compound scores. Specifically, test-retest correlations ranged from .61 (Narcissistic) to .73 (Avoidant), indicating relatively high rank-order stability over 15 years (*Hypothesis 1*). Further, the results indicate significant gender differences in aberrant personality tendencies, with women showing stronger Avoidant tendencies at T2 ($d = .36, p < .01$) and stronger Borderline tendencies at both T2 and T1 ($d = .49$ and $.56$ respectively, $p < .001$). By contrast, men showed stronger Antisocial and Narcissistic tendencies at T2 ($d = .33, p < .05$; $d = .57, p < .001$) and at T1 ($d = .27, p < .05$; $d = .39, p < .01$). An ANOVA examining differences in aberrant personality tendencies across the three categories of educational background only revealed an effect on T1 Borderline scores ($F(2,244) = 5.60, p < .01$). Post-hoc analyses further indicated that participants from alpha sciences scored significantly higher on Borderline characteristics compared to those representing beta sciences ($d = .61, p < .01$). With regard to type of employment, we found participants working part-time at T2 to score significantly higher on T2 and T1 assessments of Borderline characteristics ($d = .59$ and $.48$ respectively, $p < .01$). In addition, one significant difference in aberrant personality tendencies was found according to employment sector: participants employed in non-profit work environments scored lower on T2 Narcissistic characteristics compared to employees in the profit sector ($d = -.35, p < .01$). Finally, regarding the occupation-level

characteristics, job complexity was found to be negatively associated with T2 Narcissistic characteristics ($r = -.14, p < .05$), and Communication/Interaction was negatively associated with T2 schizotypal ($r = -.15, p < .05$) and T2 Avoidant ($r = -.17, p < .01$) tendencies.

Partial Correlations Controlling for Gender

The hypothesized associations between FFM aberrant personality tendencies and career outcomes were first tested using partial correlations only controlling for gender. For Borderline, Schizotypal, and Avoidant characteristics, negative associations were first expected with extrinsic career outcomes (*Hypothesis 2a*). As can be seen in Table 3, income showed significant ($p < .01$) and consistent (concurrent and longitudinal) negative correlations with Avoidant (T2: $r = -.20, p < .01$; T1: $r = -.20, p < .01$) and Borderline (T2: $r = -.18, p < .01$; T1: $r = -.19, p < .01$) personality tendencies. The negative correlation with Schizotypal characteristics was only significant ($r = -.17, p < .01$) when personality was assessed at T2. In line with our expectations, we also found the number of subordinates to correlate negatively with the Schizotypal (T2: $r = -.24, p < .001$; T1: $r = -.18, p < .01$) and the Avoidant (T2: $r = -.30, p < .001$; T1: $r = -.17, p < .01$) personality tendencies. The effects of Borderline characteristics, however, were not significant. Management level, finally, was significantly and consistently correlated with the Avoidant personality tendency (T2: $r = -.28, p < .001$; T1: $r = -.17, p < .01$).

In addition to these associations with extrinsic outcomes, we also expected the Schizotypal, Avoidant and Borderline tendencies to lead to less favorable intrinsic career outcomes (*Hypothesis 2b*). As shown in Table 3, these three tendencies, measured at T2 as well as at T1, correlated significantly with job satisfaction and perceived job stress. Regarding career satisfaction, the longitudinal effects of T1 Avoidant and T1 Borderline characteristics failed to reach statistical significance ($p > .01$).

Given the lack of empirical evidence and the possibility of opposite effects, no a priori expectations were formulated with regard to the effects of Antisocial, Narcissistic, and Obsessive-Compulsive personality tendencies on

career outcomes. The correlations reported in Table 3 indicate only one significant association with intrinsic career outcomes: Obsessive-Compulsive characteristics, measured at T2, were positively associated with job satisfaction ($r = .17, p < .01$). Although no significant associations were found between these three aberrant tendencies and income levels, T2 Antisocial and T2 Narcissistic tendencies did show some significant associations with the other two extrinsic outcomes. Specifically, Antisocial characteristics were positively associated with concurrent measures of the number of subordinates ($r = .20, p < .01$) and management level ($r = .32, p < .001$). T2 Narcissistic tendency was only positively associated with management level ($r = .24, p < .001$). No significant correlations were found at $p < .01$ between the Obsessive-Compulsive tendency and any of the three extrinsic career outcomes.

Partial Correlations Taking all Controls into Account

In a next step, concurrent and longitudinal associations between FFM aberrant personality tendencies and career outcomes were re-examined, now taking all control variables into account. Inspection of the partial correlations presented in Table 3 first indicates that adding employment characteristics has a substantial effect on the strength and significance of the associations between aberrant personality tendencies and extrinsic career outcomes, and only trait compounds based on the T2 assessment still produced significant associations ($p < .01$). Specifically, T2 Schizotypal and Avoidant characteristics were still negatively associated with the number of subordinates ($r = -.19, p < .01$ and $r = -.27, p < .001$ respectively), and the Avoidant compound in particular also remained significantly correlated with management level ($r = -.24, p < .001$). The significant negative association between Borderline characteristics and income disappeared when control variables were taken into account ($r = -.12, p > .05$). T2 Antisocial characteristics remained to be associated with the number of subordinates ($r = .19, p < .01$) and management level ($r = .29, p < .001$). Finally, T2 Narcissistic characteristics remained to be correlated only with acquired management level ($r = .20, p < .01$).

In contrast, taking these control variables into account did not affect the robustness of the associations between FFM aberrant tendencies and intrinsic career outcomes. Schizotypal, Avoidant and Borderline characteristics still had relatively strong associations with satisfaction and stress measures. Finally, the Antisocial, Narcissistic and Obsessive-Compulsive tendencies remained unrelated to intrinsic career outcomes.

Relative Weight Analyses

The results of the relative weight analyses further helped to disentangle the relative importance of each of the six aberrant personality tendencies for predicting career outcomes. We first calculated the *raw relative weights* (RW) associated with each of the (j) predictors in our model and for each of the (y) dependent variables. Following LeBreton and colleagues (2007), we subsequently computed rescaled relative weights ($RW - RS$) by dividing each RW_j by the model R^2 to get the percentage of predicted criterion variance attributed to that variable. For income, for instance, we found that all control variables together accounted for 76.5 or 71.6 percent of the predicted criterion variance, depending on whether T2 versus T1 personality assessments were considered. The relative contribution of the six aberrant personality tendencies, measured at T2, varied between 2.0 (Schizotypal) and 5.4 (Avoidant) percent of the total model R^2 . These coefficients were then used to rank-order FFM aberrant personality tendencies in terms of their relative importance.

With regard to the extrinsic career outcomes, the *Avoidant* and *Antisocial* personality tendencies revealed to be the most important aberrant personality tendencies. Specifically for income and number of subordinates, Avoidant characteristics consistently emerged as the most important FFM aberrant tendency. For management level, the Antisocial compound was consistently identified as the most important aberrant tendency, followed by Avoidant characteristics.

The *Avoidant*, *Schizotypal* and *Borderline* tendencies were identified as the three most important aberrant compounds for predicting intrinsic career outcomes, depending on the time of personality assessment and the specific

outcome that is considered. For both job and career satisfaction, Avoidant characteristics emerged as the most overriding aberrant personality tendency at T2 whereas Schizotypal characteristics were most important when T1 personality was considered. Job stress was consistently best predicted by Borderline characteristics.

Relative Importance of FFM General Traits versus FFM Aberrant Tendencies

The relative importance of FFM general versus FFM aberrant personality tendencies was examined in two steps. A series of hierarchical regressions were first conducted in order to examine whether the *set* of FFM aberrant personality tendencies added significantly to the prediction of career outcomes over and above FFM general traits. All control variables were entered in a first step of the regressions, followed by the FFM general traits in a second step and finally the six FFM aberrant tendencies in a third step. Separate analyses were conducted for each of the six career outcomes and for T2 versus T1 personality assessments. Table 4 reports the percentages of additional variance explained in each step of the regression (ΔR^2).

The results first show that adding T2 Big Five traits to the prediction models resulted in a significant and substantial increase in explained variance for all concurrently measured career outcomes, with ΔR^2 estimates ranging between .04 (income; $p < .01$) and .42 (perceived job stress; $p < .001$). Big Five traits also revealed to be longitudinal predictors of all career outcomes, except management level ($\Delta R^2 = .03$, $p > .05$). Interestingly, FFM aberrant personality tendencies added significantly to the prediction of the career outcomes beyond Big Five traits, although these effects were largely restricted to personality traits assessed at T2. For income, a reversed pattern was found as the incremental validity of FFM aberrant tendencies was only significant when T1 personality traits were considered ($\Delta R^2 = .04$, $p < .05$).

In addition to these incremental validity analyses, relative weight analyses were subsequently performed in order to determine the contribution that each variable, FFM general traits and FFM aberrant personality tendencies, makes to

the R^2 , in the presence of the other (correlated) traits. The results presented in Table 5 show the percentages of the model R^2 that are accounted for by each FFM general trait or aberrant personality tendency. The three strongest contributing traits were marked in bold for each career outcome in order to evaluate the relative importance of FFM general versus aberrant personality tendencies.

With regard to the *extrinsic career outcomes*, the results in Table 5 indicate that in 5 out of 6 instances (3 career outcomes \times 2 personality assessments), the strongest contributing trait was an FFM general trait. Conscientiousness and Extraversion seem particularly important. The Antisocial tendency was revealed as the most powerful predictor for management level, at least when personality was also assessed at T2. When the three strongest contributing variables to extrinsic outcomes are considered, 10 of 18 marked coefficients refer to FFM aberrant tendencies, indicating that the prediction of extrinsic career outcomes is accounted for by FFM general as well as by FFM aberrant personality tendencies.

The results clearly indicate the relative importance of FFM aberrant personality tendencies for predicting *intrinsic career outcomes*: in 4 of the 6 instances, the strongest contributing variable, highlighted with an asterisk, was aberrant in nature (Schizotypal, Avoidant, and Borderline in particular). In the longitudinal prediction of job satisfaction and job stress, however, Neuroticism as a FFM general trait was revealed as the most powerful trait predictor. When the three strongest contributing variables -marked in bold- are considered, 10 out of 18 marked coefficients refer to FFM aberrant tendencies, indicating that the prediction of intrinsic career outcomes is also accounted for by both FFM general and FFM aberrant tendencies.

Discussion

Prior research on aberrant personality characteristics in the work context has largely been dominated by traits from the dark triad. Building on recent insights in clinical psychology/psychiatry concerning the dimensional perspective on personality dysfunction, the present study examined the validity

of six aberrant personality tendencies to predict a relatively broad range of career outcomes relevant for I/O and vocational psychologists. Given that (a) aberrant tendencies are expected to be stable and of long duration (APA, 2000), and (b) career attainment is a gradual process that unfolds over time (Judge et al., 1999), a longitudinal design was adopted spanning the first 15 years of the professional career. Over this time interval, our sample of college alumni principally evolved toward highly complex jobs, many of them with a substantial Enterprising component.

The present study was the first to demonstrate cross-time stability in FFM aberrant personality tendencies, which was a first indication for their relevance as psychological constructs. Although test-retest correlations of this size have previously been reported for FFM general traits (e.g., Roberts & DelVecchio, 2000), they are nevertheless remarkable given the often turbulent developmental stages that participants experienced during this 15 year period, which included graduating, further parental separation, establishment of serious intimate relationships, and experiencing a variety of career transitions (Arnett, 2001; Kins & Beyers, 2010; Wille et al., 2010). Further, using different analytical strategies, FFM aberrant compounds also revealed to be valid predictors of subjective and objective career outcomes. As outlined below, these findings have the potential to significantly advance our understanding of aberrant personality characteristics at work and moreover offer valuable suggestions for implementation in various aspects of HR practice.

Theoretical Contributions

Bright versus dark. The relation between ‘maladaptive’ and ‘adaptive’ (in clinical contexts) or ‘bright side’ and ‘dark side’ characteristics (in I/O contexts) is a fundamental question that goes to the heart of personality theory. Hogan and colleagues (Hogan, Curphy, & Hogan, 1994; Hogan, Hogan, & Roberts, 1996), who were among the first to call the attention of I/O psychologists on derailing tendencies of managers, proposed a conceptual distinction between bright and dark side characteristics. Specifically, they referred to FFM general traits as the behavioral traits that leaders seem to exhibit

when they are performing at their best. In contrast, dark side traits are conceptualized as those irritating dysfunctional tendencies that tend to show themselves in times of increased stress or crises (Hogan & Roberts, 2004). The present study introduces an alternative, dimensional perspective on personality dysfunction in I/O psychology. Accordingly, personality functioning is conceptualized in terms of continua and personality problems are situated toward the extremes of general FFM personality dimensions (Costa & Widiger, 2002; Widiger & Lowe, 2007).

Although this was not the focus of the present study, the results indicated that several FFM general domains assessed in 1994 predicted career outcomes 15 years later, largely confirming previous long term correlational research by Judge et al. (1999). Importantly, the results also showed that this validity further generalized to the FFM aberrant personality tendencies, as each of these trait compounds showed at least one significant association with career attainment. Two factors have to be taken into account, however, when interpreting these associations.

First, diverging findings were found depending on whether or not vocation specific variables were controlled for. These results are noteworthy, as they suggest alternative explanations for aberrant trait-effects that moreover vary across the career outcomes that are considered. The most notable finding in this regard concerned the fact that the effects of Borderline, Schizotypal, and Avoidant aberrant personality tendencies on income generally disappeared when all control variables were accounted for. As indicated earlier, however, our claim is that such findings not necessarily plead against aberrant trait-effects on career outcomes because dispositional effects may well occur in an indirect manner, as outlined in the Judge and Kammeyer-Mueller (2007) model. Consider, for example, the negative association between Borderline characteristics and income, which disappeared when all controls were taken into account. Borderline characteristics were predictive for employment type (part time versus full time), which itself was among the strongest predictors of income level. One interpretation could be that the impulsiveness and emotion deregulation associated with the Borderline tendency probably affected the

employability of individuals displaying these characteristics, resulting in a higher likelihood of part-time employment. It is, therefore, inaccurate to consider the association between Borderline characteristics and income to be merely *confounded* by employment type. Rather, one could see employment type as a kind of mediating mechanism, as specified in the career attainment model by Judge and Kammeyer-Mueller (2007). Our results thus cautiously suggest that this conceptual model may probably be extended to also include aberrant personality tendencies.

Interestingly, our results also indicated that many of the trait-outcome associations remained significant when employment characteristics were controlled for. Schizotypal, Avoidant, and Antisocial tendencies remained significantly associated with number of subordinates; Avoidant, Antisocial, and Narcissistic tendencies remained significantly associated with management level. Turning back to the conceptual model by Judge and Kammeyer-Mueller, these kinds of results suggest that -across employment settings- individuals higher on certain aberrant personality tendencies elicit certain behaviors, be it in social interactions or more performance-related, that affect hierarchical attainment. Together with the ‘uncontrolled’ associations, these results are an important step in validating FFM aberrant personality tendencies in work-related contexts. One of the next steps, hence, could be to address the specific behavioral mechanisms that link aberrant personality traits to relevant work and career outcomes (cfr. *infra*).

A second factor that influenced the associations between aberrant personality tendencies and career outcomes was the timing of the personality assessment. Consistent with previous research examining the predictive validity of traits across the life course (e.g., Judge et al., 1999), the results indicated stronger associations for concurrent compared to longitudinal analyses. Nonetheless, FFM aberrant tendencies computed on the pre-employment assessment *did* predict career outcomes 15 years later, especially the intrinsic components.

The associations between FFM aberrant personality tendencies and career outcomes further shed light on ‘side effects of dark traits’ (e.g., Judge & LePine,

2007). Mainly in line with our hypotheses, Schizotypal, Avoidant and to a lesser extent Borderline personality tendencies were negative correlates of extrinsic and intrinsic career outcomes. In general, these results converge with other studies demonstrating that most forms of aberrant personality negatively impact upon career and job variables (Ettner et al., 2011; Sansone & Sansone, 2010; Yang, Coid, & Tyrer, 2010). Two aberrant personality tendencies, however, were associated with greater financial and/or hierarchical career attainment. The associations between Antisocial characteristics and extrinsic criteria such as being employed at a higher managerial level that involves supervising more people, confirm research by Van der Graaf (2007) who showed that organizations often favor and reward traits in their managers that are associated with the Antisocial personality disorder (Babiak & Hare, 2007). In addition, we also found evidence that Narcissistic characteristics were positively associated with attained management level across employment settings. Together, these findings underscore that certain aberrant personality tendencies are not necessarily detrimental for specific criteria. Instead, in line with Judge and LePine's (2007) analysis, the present work suggests that bright traits may also have a dark side and that the dark side may have bright effects.

The results regarding the FFM Obsessive-Compulsive tendency deserve a special mention, as this revealed to be the only trait compound that had no significant associations with any of the career outcomes after all control variables were taken into account. One possible explanation therefore may lie in the fact that our outcome measures were somewhat restrained. Specifically, we only included relatively broad criteria, and perhaps more significant effects of Obsessive-Compulsive characteristics would have been found when more specific work outcomes, like the quality of interactions with coworkers, were included (e.g., Ettner et al., 2011).

Relative importance. The results of a first series of relative weights analyses, conducted in order to disentangle the relative importance of each of the six (correlated) aberrant personality tendencies, were intriguing because they indicated the FFM Avoidant tendency as the most important tendency for predicting several career outcomes. With regard to income and number of

subordinates, for instance, the FFM Avoidant tendency clearly outperformed Antisocial and Narcissistic tendencies, which have up until now received far more attention in I/O literatures. Findings like these strengthen our discourse to consider aberrant personality tendencies beyond the dark triad in the work context.

Whenever new predictor variables are introduced, it is important that they *add* something to the set of predictors that are already available. We consider it an important strength of this study that the validity of FFM aberrant tendencies could be evaluated in conjunction with FFM general traits. Moscoso and Salgado (2004), for instance, argued that additional research should examine the incremental validity of ‘maladaptive’ over ‘adaptive’ personality styles. Instead of arguing that subclinical aberrant traits “are not captured by the Big Five” (Harms et al., 2011, p. 496), a more stringent approach seems to be to directly evaluate the relative importance of more aberrant and general personality tendencies, especially when a dimensional perspective on personality functioning is adopted.

The current results in this respect first suggested that alternative combinations of FFM facets, according to FFM aberrant tendencies, predicted specific career outcomes, extrinsic and intrinsic, beyond concurrent (for number of subordinates, management level, career satisfaction, job satisfaction and job stress) and initial (for income) Big Five trait assessments. Note that both the FFM aberrant compounds and the Big Five traits are different linear combinations of the same set of 30 FFM facets. The fact that FFM aberrant tendencies demonstrated incremental validity beyond the grouping of facets into FFM general domains further speaks for their significance as useful psychological constructs, similar to other compound traits used in I/O psychology, such as integrity (Ones, Viswesvaran, & Schmidt, 1993), customer service orientation (Frei & McDaniel, 1998), employee reliability (Hogan & Hogan, 1989), and managerial potential (Gough, 1984). The joint relative weight analyses of Big Five and compound traits moreover indicated that both FFM general and FFM aberrant personality tendencies are important to adequately understand career attainment from a dispositional perspective.

Finally, besides incremental validity and relative importance, a more pragmatic approach to deciding whether or not to include additional trait-like predictors concerns the additional costs in terms of time and expense. Here is where the FFM compound methodology proves to be a very economical method, as general and aberrant tendencies can be computed on the basis of one single set of traits. This brings us to the implications for practice of the current study.

Implications For Practice

An assessment of general personality traits is usually part of a selection or a development procedure and the technique described in this study can allow I/O psychologists to explore already available data in new ways. Specifically, the compound technique suggests ways for assessors and consultants to consider information from multiple traits at the same time but in an uncomplicated, straightforward way. Too often in assessment practice, information is used and interpreted at the level of single traits, even though one has administered a comprehensive personality measure. The compound technique suggests significant combinations of (facet) traits that can be highly informative in both pre- and post-employment HR practices.

First, an assessment of aberrant personality tendencies may be useful in pre-employment practices such as employee screening and selection (De Fruyt et al., 2009; Wu & Lebreton, 2011). We do not advocate that individuals with elevated scores on any of the FFM aberrant personality tendencies are per definition to be excluded from further selection rounds. Rather, aberrant personality information should be used in the same way as general trait info can be used to guide pre-employment decisions. Drawing on a thorough inspection of the job requirements, it is to be decided which tendencies, general and aberrant, are desirable or potentially harmful. For example, although obsessive-compulsive characteristics might be more an asset than a difficulty in jobs that require extreme precision and high attention for detail (e.g., some administrative or order picking functions), this tendency might be highly detrimental for jobs that require a great deal of flexibility. As an other example, indications of elevated avoidant tendencies could be taken into account when deciding about

promotions to managerial jobs that require a great deal of interpersonal contact. Finally, for jobs in the safety industry (e.g., police or military) or for functions in physically hazardous work environments (e.g., power plants), candidates with pronounced antisocial characteristics might not be retained because of their disrespect for social norms or corporate (safety) procedures.

An important caveat in assessing aberrant personality tendencies for screening or selection purposes in applied contexts concerns its legal implications (see also Wu & Lebreton, 2011). To some, assessing aberrant personality tendencies might be seen as falling under the rubric of a medical examination designed to identify a mental disability, therefore violating the Americans with Disabilities Act (ADA) of 1990. We hope to have clearly indicated, however, that the assessment of FFM aberrant personality tendencies does not break such legal regulations. The explicit focus of the paper has been to present and validate a methodology to assess *subclinical* manifestations of personality dysfunction. Although FFM aberrant compounds have been developed in the clinical domain, they are not (substitutes for) clinical diagnoses. The facets of the FFM, as assessed by the NEO PI-R, were developed and normed on normal populations. Taking a dimensional approach to personality dysfunction allows an examination of ‘healthy’ individual differences which can be applied to an understanding of more abnormal behaviors (Claridge, 2009).

Further, it is worthwhile noting that legal issues can also be applied to argue *in favor of* an assessment of aberrant personality tendencies in the work context. The Employers’ Liability Act (1969), for instance, holds employers responsible for the health and safety of their employees while at work. The fact that some forms of personality dysfunction are potentially associated with harmful social contacts at work emphasizes the need to screen for such aberrant personality tendencies. Narcissism, for example, predicts aggression and bullying (Bushman & Baumeister, 1998) and is also likely to be linked to an overly sexualized workplace (Campbell et al., 2011). In the context of ‘negligent hiring’, referring to an employer’s failure to exercise reasonable caution when

hiring an employee, screening for aberrant personality tendencies seems a legal obligation rather than a violation.

Knowledge of aberrant personality tendencies in employees can also be of great use for post-employment HR practices. First, this may help personnel psychologists to manage and improve interpersonal relations among employees. Online support groups and a vast amount of information are available for the HR professional to help people manage interactions with personality-disturbed individuals (Brown, 2002). Yet, these resources are of little use if the aberrant personality tendency is not identified or well understood, especially since 'healthy' individuals sometimes erroneously assume the responsibility for conflict in their relationships with disordered individuals (Yudofsky, 2005). Corporate Employee Assistant Programs (EAP) personnel, who are more accustomed to dealing with problems such as fear of failure or burnout symptoms, can be trained to identify and interact appropriately with employees with personality dysfunction. To give one example, it may be helpful to inform coworkers that the avoidant symptoms displayed by a staff member do not signal a lack of interest or contempt, but rather are an expression of self-presumed inadequacy and fear of being ridiculed.

Secondly, knowledge of aberrant personality tendencies may also be used for post-employment interventions concerning coaching and development (e.g., De Fruyt et al., 2009; Judge & LePine, 2007; Wu & Lebreton, 2011). Although the findings of this study support previous research indicating stability of personality characteristics, this does not imply that individuals cannot be coached to deal with their own personality tendencies in an appropriate manner. Drawing on insights from trait-activation theory (Tett & Burnett, 2003), for instance, one strategy could be to help individuals identify and adequately manage those situational triggers that elicit dysfunctional tendencies.

Finally, one could argue that the proposed compounds are of limited practical use in selection and development assessment settings because it is difficult to determine what constitutes a significant elevation on such a compound scale for an individual (Miller et al., 2008). To make this methodology directly accessible and applicable, De Fruyt and colleagues (2009)

have recently proposed normative benchmarks to interpret FFM aberrant compound scores. Importantly, these benchmarks also take into account the different assessment contexts, i.e. development and selection, in which the methodology is being deployed (De Fruyt et al., 2009). Accordingly, individuals scoring beyond a certain cut-off above the mean are ‘flagged’ as being at risk for this particular aberrant personality tendency, indicating that they might require further assessment. These procedures can be easily implemented, especially via an electronic scoring procedure, providing immediate information for the selection psychologist or coach to further examine potential dysfunctional tendencies through, for example, a behaviorally oriented interview. The major advantage of using FFM aberrant compounds for these purposes is that this technique allows a simultaneous examination of general and aberrant personality tendencies using one and the same instrument.

Limitations and Directions for Future Research

Besides these theoretical and practical contributions, a number of limitations to this study should also be noted. First, the FFM aberrant compounds are derived from clinical personality disorder constructs that have a number of problems – as such, the FFM aberrant personality tendencies may exhibit similar problems. For example, comorbidity among personality disorders is considered a major problem of the categorical approach (Clark, 2007). Given the correlated nature of the FFM aberrant compound target constructs (i.e. personality disorders) and the number of facets they have in common, the FFM aberrant personality tendencies will also manifest substantial intercorrelations, which may pose problems in terms of their discriminant validity. It is therefore possible that a smaller number of FFM aberrant personality tendencies should be retained and used. Based on the most recent proposal for DSM-5, we already used a subsample of six FFM compounds. Future studies could address whether a more limited set of FFM aberrant personality tendencies should be retained for work applications.

One of the major contributions of our study was that we considered aberrant personality tendencies outside the scope of the dark triad, and our

results indicated that this is an important way to go because these outperformed the more established aberrant trait constructs (i.e. Narcissistic and Antisocial) in the prediction of certain work outcomes. Our conclusions in this respect are limited, however, in that the contribution relative to Machiavellianism could not be directly established. Further, we would encourage future researchers to examine the importance of FFM aberrant personality tendencies relative to dark triad traits assessed with more traditional instruments.

A third limitation concerns the fact that the compound traits are described in terms of combinations of facets of the NEO PI-R, the flagship inventory for the assessment of the FFM, and the compounds are hence bound to this inventory or other assessment tools based on this same operationalization (e.g., Structured Interview for the Five Factor Model; Trull & Widiger, 1997). Krueger and Eaton (2010) have argued in this respect to distinguish among the model and its operationalization, implying that alternative compounds will have to be suggested for other (Big Five) personality inventories.

Fourth, the present study was based exclusively on self-reports, introducing common method bias as a potential confound for some of the associations. However, the fact that we also tested personality-outcome associations longitudinally may -in part- alleviate such concerns. Another limitation concerning the use of self-reports is that some of the outcome measures might be subject to response distortion. This is particularly noteworthy in the light of the present study because such response distortion might be systematically related to some of the aberrant personality tendencies that are considered here. Narcissistic individuals, for instance, have an inflated sense of self-worth and much of their behavior is aimed at boosting this image. Clearly, this could include overrating extrinsic career outcomes such as financial and/or hierarchical attainment. According to Podsakoff and Organ (1986) response distortion is less likely to be an issue for information that is factual, likely to be in the possession of the respondent, and at least in principle verifiable. In this regard, it is interesting to compare findings regarding income and number of subordinates, which are objectively quantifiable, with findings for management level, which is more qualitatively evaluated. Our findings indeed indicate that

Narcissism, measured at T2, is more strongly related to self-reported management level than to income or number of subordinates. It can be considered a richness of the present study that a broad range of career outcomes, varying in the degree to which they are open to objectification, are considered.

Finally, one of the appealing aspects of this study is that a cohort of career starters, homogeneous in terms of educational level, could be tracked over time. With some exceptions, all college alumni evolved toward relatively high complex jobs in Enterprising-Conventional (e.g., managers) or Intellectual-Conventional (e.g., IT engineers) vocations. In order to examine the generalizability of our findings, however, future studies could (a) examine FFM aberrant personality tendencies in more diverse professional settings, and (b) examine potential interactions between such occupational characteristics and aberrant personality tendencies with regard to relevant work outcomes. In the present study, specific occupational requirements (job complexity, information/data processing, and interacting with people) were included as control variables in the substantive analyses. With the present study having provided initial evidence for the validity of FFM aberrant personality tendencies to predict relevant work outcomes, future research could focus on the precise circumstances under which (e.g., situational moderators) and the precise mechanisms through which (e.g., behavioral mediators) aberrant personality tendencies might result in beneficial or disadvantageous effects for individuals at work. Our overview of the positive and negative manifestations at work associated with each of the aberrant personality tendencies may serve as a useful framework for this purpose.

Conclusion

The current study is the first to demonstrate the predictive validity of the FFM aberrant compounds for understanding and predicting career outcomes. The results are germane to a broad group of psychologists who may be interested in the potential of aberrant personality tendencies beyond the dark triad to predict career adaptation and attainment. More specifically, the results are particularly informative for personnel psychologists who may be interested

to learn about alternative linear combinations of FFM facet level traits beyond the familiar Big Five FFM domains. The current methodology demonstrates alternative avenues for assessing and understanding aberrant personality at work, using a general trait model familiar to most psychologists. It is concluded that a better understanding of aberrant personality tendencies at work may allow managers to make better informed decisions during pre- and post-employment HR practices.

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Tables

Table 1

Key features, and positive (+) and negative (-) manifestations at work associated with aberrant personality tendencies

Tendency	Key features	Manifestations at work
Antisocial	indifferent to others; callous social attitudes; impulsive and hot-tempered; superficial charm	(+) may use extroverted charm to convey charisma and ambition (-) elevated risk of violent, dangerous and aggressive counterproductive work behavior, impulsive and risky decisions
Narcissistic	strong sense of self-importance; need to be admired; lack of insight into other people's feelings and needs; quest to dominate others	(+) charismatic appearance (+) leadership emergence (-) destructive relationships with coworkers (-) heightened risk of engagement in counterproductive work behaviors (-) over-valuation of one's capabilities
Borderline	poor self-concept; uncertainty about life roles; impulsive, unstable interpersonal relations; inappropriate anger	(-) difficulty to sustain employment (-) unpredictable interactions with coworkers and/or supervisors (-) inefficiency at work (-) low satisfaction levels
Schizotypal	unconventional/odd beliefs; disorganized thoughts and speech; socially anxious; suspicious of others	(+) acting and thinking in creative ways (-) poor interpersonal functioning (-) susceptibility to work stress
Obsessive-Compulsive	perfectionist; preoccupied with order; frequently miserly or stingy; rigid, obstinate, inflexible	(+) attention for detail (+) formal work ethic (+) strong achievement focus (+) high work involvement (-) desire for perfection may stifle productivity, hamper collaboration with coworkers, and nurture work stress
Avoidant	feelings of inadequacy; hypersensitivity to criticism; social inhibition	(-) work role functioning is limited to environments that are nonthreatening and only require minimum social interactions (-) performance is affected by poor interpersonal skills (-) low self-esteem at work

Table 2
Correlations between all study variables

	1	2	3	4	5	6	7	8	9	10
1. Gender	-									
2. Education dummy 1	.29 [†]	-								
3. Education dummy 2	-.35 [†]	-.41 [†]	-							
4. Employment type	-.37 [†]	-.12	.22 ^{**}	-						
5. Sector	.18 ^{**}	.15 [*]	-.34 [†]	-.16 [*]	-					
6. Complexity	.00	-.09	-.03	.07	.12	-				
7. Information GWA	-.09	-.21 ^{**}	-.11	.01	.08	.38 [†]	-			
8. Communicate GWA	.07	-.05	-.35 [†]	-.09	.11	.08	.49 [†]	-		
9. Schizotypal T2	.01	.15 [*]	.01	-.08	-.07	-.05	-.12	-.15 [*]	(.61)	
10. Schizotypal T1	.02	.14 [*]	.01	-.05	.05	.02	-.05	-.07	.65 [†]	(.60)
11. Avoidant T2	.18 ^{**}	.18 ^{**}	-.06	-.12	.04	-.04	-.10	-.17 ^{**}	.76 [†]	.58 [†]
12. Avoidant T1	.13 [*]	.14 [*]	.05	-.09	.07	-.03	-.08	-.11	.54 [†]	.78 [†]
13. Borderline T2	.24 [†]	.16 [*]	-.18 ^{**}	-.21 ^{**}	-.02	-.04	-.03	.02	.41 [†]	.25 [†]
14. Borderline T1	.27 [†]	.20 ^{**}	-.16 [*]	-.17 ^{**}	.10	.03	-.03	-.04	.28 [†]	.38 [†]
15. Antisocial T2	-.16 [*]	-.12	-.01	.04	-.12	-.08	.05	.12	-.20 ^{**}	-.22 ^{**}
16. Antisocial T1	-.14 [*]	-.06	-.07	.04	-.06	.02	.08	.02	-.13 [*]	-.19 ^{**}
17. Narcissistic T2	-.28 [†]	-.16 [*]	.09	.08	-.17 ^{**}	-.14 [*]	.00	.06	-.02	-.06
18. Narcissistic T1	-.19 ^{**}	-.10	-.03	.06	-.07	.01	.05	.01	.01	.04
19. Obsessive-Compulsive T2	.02	-.03	.08	.06	.06	.05	-.03	-.06	-.05	.10
20. Obsessive-Compulsive T1	.02	-.07	.07	.04	.02	.02	-.05	-.01	.04	.12
21. Neuroticism T2	.25 [†]	.18 ^{**}	-.14 [*]	-.23 [†]	-.01	-.07	-.08	-.08	.64 [†]	.41 [†]
22. Neuroticism T1	.26 [†]	.18 ^{**}	-.08	-.16 [*]	.07	-.02	-.08	-.07	.42 [†]	.59 [†]
23. Extraversion T2	-.02	-.14 [*]	-.03	.05	.04	.07	.10	.22 [†]	-.80 [†]	-.60 [†]
24. Extraversion T1	-.01	-.15 [*]	-.07	.04	-.05	.04	.09	.15 [*]	-.56 [†]	-.82 [†]
25. Openness T2	.10	.14 [*]	-.08	-.05	.02	.09	-.02	.10	.10	.05
26. Openness T1	.18 ^{**}	.18 ^{**}	-.18 ^{**}	-.10	.11	.09	.02	.10	.07	.08
27. Agreeableness T2	.16 [*]	.08	-.05	-.04	.16 [*]	.15 [*]	.03	-.02	-.15 [*]	-.08
28. Agreeableness T1	.14 [*]	.04	.04	-.03	.07	.00	-.03	.01	-.15 [*]	-.24 [†]
29. Conscientiousness T2	-.04	-.11	.14 [*]	.18 ^{**}	-.02	.11	.02	.03	-.37 [†]	-.16 [*]
30. Conscientiousness T1	-.02	-.14 [*]	.02	.09	.02	.07	.01	.06	-.15 [*]	-.17 ^{**}
31. Income	-.37 [†]	-.27 [†]	.22 ^{**}	.49 [†]	-.30 [†]	.13	.18 ^{**}	.05	-.17 ^{**}	-.16 [*]
32. Number subordinates	-.25 [†]	-.23 [†]	.12	.25 [†]	.08	-.17 ^{**}	.03	.16 [*]	-.24 [†]	-.17 ^{**}
33. Management level	-.25 [†]	-.20 ^{**}	.12	.26 [†]	-.12	-.12	.06	.18 ^{**}	-.13	-.10
34. Career satisfaction	-.09	-.01	.06	.10	.04	.16 [*]	.11	.08	-.35 [†]	-.27 [†]
35. Job satisfaction	-.06	-.04	.09	.16 [*]	.04	.07	-.02	.06	-.41 [†]	-.23 [†]
36. Stress	.08	.09	-.06	-.03	-.01	.10	.03	.01	.53 [†]	.39 [†]

Table 2 (*Continued*)

	11	12	13	14	15	16	17	18	19	20
11. Avoidant T2	(.77)									
12. Avoidant T1	.73 [†]	(.78)								
13. Borderline T2	.18**	.10	(.72)							
14. Borderline T1	.20**	.20**	.63 [†]	(.72)						
15. Antisocial T2	-.60 [†]	-.49 [†]	.37 [†]	.16*	(.73)					
16. Antisocial T1	-.43 [†]	-.62 [†]	.26 [†]	.31 [†]	.66 [†]	(.75)				
17. Narcissistic T2	-.39 [†]	-.32 [†]	.20**	.03	.86 [†]	.55 [†]	(.69)			
18. Narcissistic T1	-.25 [†]	-.38 [†]	.16*	.14*	.56 [†]	.87 [†]	.61 [†]	(.73)		
19. Obsessive-Compulsive T2	.38 [†]	.34 [†]	-.44 [†]	-.20**	-.48 [†]	-.36 [†]	-.12	-.14*	(.67)	
20. Obsessive-Compulsive T1	.34 [†]	.44 [†]	-.32 [†]	-.40 [†]	-.38 [†]	-.53 [†]	-.12	-.15*	.66 [†]	(.68)
21. Neuroticism T2	.56 [†]	.38 [†]	.86 [†]	.59 [†]	.04	.01	.00	.00	-.15*	-.08
22. Neuroticism T1	.46 [†]	.58 [†]	.53 [†]	.86 [†]	-.10	-.06	-.12	-.08	.03	-.06
23. Extraversion T2	-.86 [†]	-.62 [†]	-.06	-.08	.45 [†]	.29 [†]	.18**	.10	-.27 [†]	-.21**
24. Extraversion T1	-.61 [†]	-.86 [†]	-.04	-.06	.36 [†]	.39 [†]	.16*	.12	-.20**	-.28 [†]
25. Openness T2	-.24 [†]	-.14*	.37 [†]	.22 [†]	.13*	.09	-.10	-.04	-.63 [†]	-.40 [†]
26. Openness T1	-.15*	-.19**	.25 [†]	.35 [†]	.06	.07	-.11	-.16*	-.42 [†]	-.52 [†]
27. Agreeableness T2	.11	.11	-.30 [†]	-.16*	-.75 [†]	-.44 [†]	-.89 [†]	-.51 [†]	.01	.03
28. Agreeableness T1	.08	.13*	-.22	-.24 [†]	-.49 [†]	-.77 [†]	-.58 [†]	-.92 [†]	.06	.07
29. Conscientiousness T2	-.14*	-.04	-.51 [†]	-.29 [†]	-.25 [†]	-.16*	-.01	-.03	.77 [†]	.46 [†]
30. Conscientiousness T1	.02	-.03	-.37 [†]	-.46 [†]	-.22 [†]	-.32 [†]	-.03	-.06	.47 [†]	.78 [†]
31. Income	-.26 [†]	-.24 [†]	-.22**	-.27 [†]	.19**	.15*	.21**	.18**	.06	.11
32. Number subordinates	-.33 [†]	-.19**	-.13*	-.14*	.23 [†]	.08	.18**	.05	-.03	-.02
33. Management level	-.31 [†]	-.17**	-.02	-.06	.34 [†]	.16*	.29 [†]	.14*	-.11	-.03
34. Career satisfaction	-.34 [†]	-.17**	-.22**	-.09	.06	-.03	.00	-.11	.12	.04
35. Job satisfaction	-.36 [†]	-.17**	-.34 [†]	-.22**	-.03	-.08	-.07	-.11	.17**	.07
36. Stress	.48 [†]	.34 [†]	.52 [†]	.37 [†]	.02	-.03	.05	.02	-.03	.07

Table 2 (*Continued*)

	21	22	23	24	25	26	27	28	29	30
21. Neuroticism T2	(.80)									
22. Neuroticism T1	.66 [†]	(.81)								
23. Extraversion T2	-.37 [†]	-.29 [†]	(.76)							
24. Extraversion T1	-.25 [†]	-.35 [†]	.69 [†]	(.78)						
25. Openness T2	.10	.05	.19**	.11	(.73)					
26. Openness T1	.08	.11	.12	.21**	.65 [†]	(.67)				
27. Agreeableness T2	-.21**	-.08	.03	-.02	.18**	.15*	(.77)			
28. Agreeableness T1	-.13*	-.12	.05	.09	.08	.18**	.58 [†]	(.78)		
29. Conscientiousness T2	-.46 [†]	-.23 [†]	.15*	.12	-.24 [†]	-.17**	.06	.05	(.82)	
30. Conscientiousness T1	-.27 [†]	-.31 [†]	.05	.14*	-.17**	-.13*	.05	.09	.54 [†]	(.82)
31. Income	-.27 [†]	-.29 [†]	.19**	.22**	-.10	-.14*	-.15*	-.16*	.23**	.24 [†]
32. Number subordinates	-.23 [†]	-.16*	.31 [†]	.21**	-.07	-.07	-.06	-.01	.12	.07
33. Management level	-.14*	-.08	.26 [†]	.17**	.00	-.08	-.20**	-.12	.05	.03
34. Career satisfaction	-.27 [†]	-.14*	.33 [†]	.24 [†]	-.09	.01	.05	.15*	.27 [†]	.11
35. Job satisfaction	-.41 [†]	-.24 [†]	.33 [†]	.19**	-.06	.01	.15*	.15*	.36 [†]	.12
36. Stress	.61 [†]	.46 [†]	-.35 [†]	-.24 [†]	.02	.02	-.20**	-.15*	-.29 [†]	-.08

Table 2 (*Continued*)

	31	32	33	34	35	36
31. Income	-					
32. Number subordinates	.33 [†]	-				
33. Management level	.39 [†]	.61 [†]	-			
34. Career satisfaction	.21**	.26 [†]	.20**	(.92)		
35. Job satisfaction	.16*	.27 [†]	.23 [†]	.63 [†]	(.85)	
36. Stress	-.01	-.13*	-.08	-.39 [†]	-.51 [†]	(.87)

Note. Gender is coded (1) male and (2) female. Employment is coded (1) part-time and (2) full-time. Sector is coded (1) profit and (2) non-profit. GWA = Generalized Work Activity. T2 and T1 refer to Time 2 (2009) and Time 1 (1994) personality assessments respectively. Facet level internal consistencies of FFM general and aberrant compounds are reported on the diagonal. Due to missing data for career outcomes in particular, sample size varies between 226 and 247. * $p < .05$; ** $p < .01$; [†] $p < .001$.

Table 3

Partial correlations and relative importance of FFM aberrant tendencies

	Partial r_{yj} Controlling for gender		Partial r_{yj} All controls included		RW_j		$RW_j - RS$	
	T2	T1	T2	T1	T2	T1	T2	T1
Dependent variable = Income ($R^2 = .42/.45$ for the model including T2/T1 traits)								
Control variables	-	-	-	-	.326	.327	76.5	71.6
Schizotypal	-.17**	-.15	-.14	-.10	.008	.009	2.0	2.1
Avoidant	-.20**	-.20**	-.15	-.14	.023	.028	5.4	6.1
Borderline	-.18**	-.19**	-.12	-.16	.022	.029	5.2	6.4
Antisocial	.13	.10	.09	.07	.021	.022	5.0	4.9
Narcissistic	.12	.12	.10	.10	.012	.011	2.8	2.4
Obsessive-Compulsive	.08	.13	.09	.16	.014	.030	3.2	6.6
Dependent variable = Number of subordinates ($R^2 = .34/.26$ for the model including T2/T1 traits)								
Control variables	-	-	-	-	.197	.219	58.3	83.8
Schizotypal	-.24 [†]	-.18**	-.19**	-.16	.018	.010	5.4	4.0
Avoidant	-.30 [†]	-.17**	-.27 [†]	-.16	.051	.014	15.0	5.2
Borderline	-.07	-.08	-.02	-.03	.008	.005	2.3	1.8
Antisocial	.20**	.05	.19**	.08	.035	.007	10.3	2.6
Narcissistic	.13	.01	.10	.02	.018	.005	5.2	1.7
Obsessive-Compulsive	-.02	-.01	-.04	-.05	.011	.002	3.3	0.9
Dependent variable = Management level ($R^2 = .30/.21$ for the model including T2/T1 traits)								
Control variables	-	-	-	-	.144	.175	48.0	82.3
Schizotypal	-.13	-.10	-.09	-.05	.013	.003	4.3	1.6
Avoidant	-.28 [†]	-.17**	-.24 [†]	-.10	.044	.009	14.4	4.4
Borderline	-.04	.00	.08	.06	.006	.002	2.0	0.9
Antisocial	.32 [†]	.13	.29 [†]	.14	.057	.013	18.8	6.0
Narcissistic	.24 [†]	.10	.20**	.09	.029	.007	9.7	3.5
Obsessive-Compulsive	-.11	-.03	-.12	-.05	.008	.003	2.8	1.3
Dependent variable = Career satisfaction ($R^2 = .27/.16$ for the model including T2/T1 traits)								
Control variables	-	-	-	-	.040	.057	15.4	36.6
Schizotypal	-.35 [†]	-.27 [†]	-.34 [†]	-.28 [†]	.043	.046	16.2	29.2
Avoidant	-.33 [†]	-.16	-.32 [†]	-.17**	.081	.021	30.6	13.3
Borderline	-.20**	-.07	-.19**	-.07	.016	.003	6.1	1.8
Antisocial	.05	-.04	.07	-.03	.024	.008	9.1	5.3
Narcissistic	-.02	-.12	-.01	-.12	.017	.015	6.4	9.7
Obsessive-Compulsive	.12	.04	.11	.03	.043	.006	16.1	4.1
Dependent variable = Job satisfaction ($R^2 = .34/.14$ for the model including T2/T1 traits)								
Control variables	-	-	-	-	.035	.053	10.4	37.2
Schizotypal	-.41 [†]	-.23 [†]	-.40 [†]	-.24 [†]	.060	.023	17.8	16.0
Avoidant	-.36 [†]	-.17**	-.34 [†]	-.17**	.104	.019	30.9	13.7
Borderline	-.34 [†]	-.21**	-.31 [†]	-.20**	.042	.020	12.4	14.2
Antisocial	-.04	-.08	-.03	-.06	.025	.008	7.3	5.9
Narcissistic	-.09	-.12	-.09	-.11	.022	.012	6.5	8.8
Obsessive-Compulsive	.17**	.07	.16	.05	.050	.006	14.9	4.3

Table3 (Continued)

	Partial r_{yj} Controlling for gender		Partial r_{yj} All controls included		RW_j		$RW_j - RS$	
	T2	T1	T2	T1	T2	T1	T2	T1
Dependent variable = Job stress ($R^2 = .49/.26$ for the model including T2/T1 traits)								
Control variables	-	-	-	-	.031	.023	6.7	8.5
Schizotypal	.53 [†]	.39 [†]	.53 [†]	.39 [†]	.109	.067	22.1	26.3
Avoidant	.47 [†]	.34 [†]	.48 [†]	.35 [†]	.130	.046	26.5	18.1
Borderline	.52 [†]	.36 [†]	.52 [†]	.36 [†]	.164	.093	33.5	36.2
Antisocial	.03	-.02	.04	-.03	.027	.010	5.6	3.7
Narcissistic	.07	.04	.09	.04	.009	.002	1.9	0.9
Obsessive-Compulsive	-.03	.07	-.03	.08	.019	.016	3.8	6.1

Note. Partial r_{yj} = partial correlations between dependent (y) and independent (j) variables taking the control variables into account; RW_j = raw relative weight estimates associated with each of the predictor variables; rescaled relative weight estimates ($RW_j - RS$) indicate the percentage of the model R^2 that is accounted for by predictor (j). Raw and rescaled relative weights of the control variables were summed. ** $p < .01$; [†] $p < .001$.

Table 4

Incremental validities (ΔR^2) obtained from hierarchal regression models including controls (Step 1), FFM general traits (Step 2), and FFM aberrant compounds (Step 3) to predict career outcomes

Career outcomes	Control variables	FFM general tendencies		FFM aberrant tendencies ^a	
		T2	T1	T2	T1
Income	.37 [†]	.04 ^{**}	.07 [†]	.01	.04 [*]
Number of subordinates	.23 [†]	.07 ^{**}	.04 [*]	.08 [†]	.01
Management level	.18 [†]	.06 ^{**}	.03	.08 [†]	.01
Career satisfaction	.05	.15 [†]	.08 [†]	.08 [†]	.03
Job satisfaction	.06	.22 [†]	.07 ^{**}	.07 ^{**}	.04
Job stress	.03	.42 [†]	.23 [†]	.07 ^{**}	.02

Note. ^a Separate analyses were conducted for T2 FFM aberrant tendencies (predicting career outcomes beyond control variables and T2 general traits) and T1 FFM aberrant tendencies (predicting career outcomes beyond control variables and T1 general traits). * $p < .05$; ** $p < .01$; [†] $p < .001$.

Table 5

Rescaled relative weights ($RW_j - RS$) of FFM general and FFM aberrant personality tendencies for predicting career outcomes

	Extrinsic outcomes						Intrinsic outcomes					
	Income		Number of subordinates		Management level		Career satisfaction		Job satisfaction		Job stress	
	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1
<i>Total model R^2</i>	.43	.48	.38	.28	.31	.22	.28	.16	.35	.17	.51	.27
<i>Rescaled relative weights</i>												
Control variables	72.4	64.7	50.5	76.6	44.0	74.7	14.2	34.2	8.4	30.2	6.7	7.7
General tendencies												
Neuroticism	3.2	3.8	3.2	1.5	1.6	0.7	5.0	3.4	11.2	9.7*	19.2	25.0*
Extraversion	3.0	5.1*	9.4*	7.9*	7.9	6.3*	14.3	12.7	11.2	9.1	7.9	6.5
Openness	0.9	1.4	2.2	1.7	0.6	2.1	3.9	1.0	2.3	3.1	1.5	1.1
Agreeableness	2.3	3.6	3.8	0.8	5.4	2.9	2.0	6.4	2.8	3.4	2.3	4.2
Conscientiousness	4.0*	4.9	1.7	0.7	1.8	0.4	7.4	2.2	9.8	3.6	4.8	1.5
Aberrant tendencies												
Schizotypal	1.5	2.2	3.7	2.9	3.7	2.2	9.4	17.2*	9.5	8.4	13.7	16.7
Avoidant	2.6	2.9	8.1	3.6	8.5	3.7	20.5*	7.7	18.0*	7.8	15.5	10.8
Borderline	3.4	4.1	2.0	1.4	1.7	0.9	3.8	1.7	7.0	8.8	19.5*	19.3
Antisocial	3.0	2.7	8.7	1.4	14.4*	3.4	6.6	4.2	5.6	4.0	3.9	2.9
Narcissistic	2.0	2.1	4.3	0.9	7.3	2.1	5.0	5.9	5.3	4.7	2.0	2.3
Obsessive-Compulsive	1.8	2.5	2.4	0.7	2.8	0.9	8.1	3.3	9.0	7.3	3.1	2.0

Note. $RW_j - RS$ reflects the percentage of predicted criterion variance attributed to each trait, taking all control variables into account. Relative weights of these controls are summed. For each career outcome, the three highest coefficients are indicated in bold. The single best trait predictor is indicated by an asterisk (*). Rescaled relative weights of the control variables are summed.

Appendix A

NEO PI-R traits	High scorers...
Neuroticism	...are more likely to experience feelings as anxiety, anger, guilt, and depression.
<i>N1: Anxiety</i>	...are apprehensive, fearful, prone to worry, nervous, and tense.
<i>N2: Angry hostility</i>	...are hot-tempered, angry, and frustrated.
<i>N3: Depression</i>	...are prone to feelings of guilt, sadness, hopelessness and loneliness.
<i>N4: Self consciousness</i>	...are uncomfortable around others and sensitive to ridicule.
<i>N5: Impulsiveness</i>	...are unable to resist cravings, hasty, sarcastic and self-centered.
<i>N6: Vulnerability</i>	...are easily rattled, panicked, and unable to deal with stress.
Extraversion	...tend to enjoy human interactions and to be talkative, assertive, and gregarious.
<i>E1: Warmth</i>	...are characterized as being outgoing, talkative and affectionate.
<i>E2: Gregariousness</i>	...are convivial, have many friends, and seek social contact.
<i>E3: Assertiveness</i>	...are dominant, forceful, and socially ascendant.
<i>E4: Activity</i>	...are described as being energetic, fast-paced and vigorous.
<i>E5: Excitement seeking</i>	...crave excitement and stimulation.
<i>E6: Positive emotions</i>	...are seen as cheerful, high-spirited, joyful, and optimistic.
Openness to experience	...are intellectually curious, appreciative of art, and sensitive to beauty.
<i>O1: Fantasy</i>	...have a vivid imagination and an active fantasy life.
<i>O2: Aesthetics</i>	...have a deep appreciation of art and beauty.
<i>O3: Feelings</i>	...experience deeper and more differentiated emotional states.
<i>O4: Actions</i>	...prefer novelty and variety to familiarity and routine.
<i>O5: Ideas</i>	...enjoy both philosophical arguments and brain-teasers.
<i>O6: Values</i>	...are seen as tolerant, broad-minded, nonconforming, and open-minded.
Agreeableness	...are generally considerate, friendly, generous, and helpful.
<i>A1: Trust</i>	...have a disposition to believe that others are honest and well intentioned.
<i>A2: Straightforwardness</i>	...are characterized as being direct, frank, candid, and ingenuous.
<i>A3: Altruism</i>	...have an active concern for others' welfare.
<i>A4: Compliance</i>	...tend to defer to others, to inhibit aggression, and to forgive and forget.
<i>A5: Modesty</i>	...are humble although they are not necessarily lacking in self-confidence.
<i>A6: Tendermindedness</i>	...moved by others' needs and emphasize the human side of social policies.
Conscientiousness	...are generally hard working, reliable, careful and deliberate.
<i>C1: Competence</i>	...feel well prepared to deal with life.
<i>C2: Order</i>	...are neat, tidy and well organized.
<i>C3: Dutifulness</i>	...adhere strictly to their ethical principles and moral obligations.
<i>C4: Achievement striving</i>	...have high aspiration levels and work hard to achieve their goals.
<i>C5: Self discipline</i>	...have the ability to motivate themselves to get the job done.
<i>C6: Deliberation</i>	...are cautious and deliberate.

Appendix B

Aberrant trait pattern	Scoring the Five-Factor Model aberrant personality tendency
Schizotypal	$N1 + N4 + E1(r) + E2(r) + E6(r) + O5 + C2(r)$
Avoidant	$N1 + N4 + N5(r) + N6 + A5 + E2(r) + E3(r) + E5(r) + E6(r) + O4(r)$
Borderline	$N1 + N2 + N3 + N5 + N6 + O3 + O4 + A4(r) + C6(r)$
Antisocial	$N1(r) + N2 + N4(r) + N5 + E3 + E4 + E5 + O4 + A1(r) + A2(r) + A3(r) + A4(r) + A5(r) + A6(r) + C3(r) + C5(r) + C6(r)$
Narcissistic	$N2 + N4(r) + E1(r) + E3 + E5 + O3(r) + O4 + A1(r) + A2(r) + A3(r) + A4(r) + A5(r) + A6(r)$
Obsessive-Compulsive	$N1 + N5(r) + E5(r) + O3(r) + O4(r) + O5(r) + O6(r) + C1 + C2 + C3 + C4 + C5 + C6$

(r) indicates that the facet must be reverse scored (i.e., (facet x * -1) +32))

Appendix C

Job Stress Scale items

I often feel under pressure at work.

I experience a good balance between professional and family life. (R)

Recently, everything concerning my job takes great pains.

Sometimes I am not able to face the next work day.

My job demands too much from me.

Once I have finished my job, I can easily relax. (R)

My job makes me tense most of the time.

Note. (R) indicates that the item was reverse-scored.

Chapter 4

Maturation of work attitudes: Correlated change with dispositions and reciprocal effects over 15 years¹

Abstract

As employees grow older, do their attitudes regarding work change over time? Can such long-term changes be understood from a dispositional perspective? The present study addressed these fundamental questions by tracking 504 young professionals' work attitudes (i.e. job satisfaction and work involvement) and personal dispositions (i.e. Big Five traits) over the first 15 years of their professional career. We specifically investigated whether trait changes drive peoples' changing attitudes, a mechanism we called maturation of work attitudes. Latent change models first indicated significant associations between traits and attitudes at the beginning of the career, and mean-level changes in Big Five traits (i.e. increases in Agreeableness and Conscientiousness, and decreases in Neuroticism) in the direction of functional maturity. Although no significant mean-level changes in work attitudes were obtained, results regarding correlated change indicated that variability in attitude change was related to variability in trait change, and that this indeed signaled a maturational process. Finally, reciprocal effect estimates highlighted bi-directional relations between dispositions and attitudes. It is discussed how these results (a) provide a better understanding of potential age effects on work-related attitudes and (b) imply a revision of the traditional dispositional approach to attitudes.

¹ Wille, B., De Fruyt, F., & Beyers, W. (2012). Maturation of work attitudes: Correlated change with dispositions and reciprocal effects over 15 years. *Manuscript under revision*.

Introduction

Work attitudes have recently been described as one of the oldest, most popular, and most influential areas of inquiry in the Organizational Behavior (OB) literature (Judge & Kammeyer-Mueller, 2012). One notable reason for this, is that they are traditionally conceived as predictors of relevant behaviors (e.g., the theory of planned behavior; Ajzen, 1991). The association between employee satisfaction and in-role performance, for instance, is among the most frequently studied phenomena in applied psychology (Brief & Weiss, 2002). Similarly, a central question in OB attitude literature is whether indicators of involvement in work are predictive for extra-role behaviors, such as organizational citizenship behaviors (Diefendorff, Brown, Kamin, & Lord, 2002; Judge & Kammeyer-Mueller, 2012; Organ & Ryan, 1995).

Given their prominence in the literature, studies have also aimed at uncovering the antecedents of work attitudes, and increased attention is being devoted in this line of research to their dispositional source (e.g., Judge & Larsen, 2001; Staw & Cohen-Charash, 2005). Early researchers such as Staw and Ross (1985) and Steel and Rentsch (1997) found work attitudes to be relatively stable over time, and used such findings to argue for the existence of a dispositional basis. More recently, further evidence for this dispositional approach has been provided by studies directly demonstrating cross-sectional and longitudinal associations between prominent dispositional models, including the Five-Factor Model of personality (FFM; McCrae & Costa, 1987), and the most prominent work attitudes, including satisfaction and involvement (Bowling, Beehr, & Lepisto, 2006; Bruk-Lee, Khoury, Nixon, Goh, & Spector, 2009; Judge, Heller, & Mount, 2002). Overall, it is now grounded to say that work-related attitudes, covering “*the evaluation or personal importance of work-related targets*” (Riketta, 2008, p. 472), are -at least partially- dispositionally based (Judge & Kammeyer-Mueller, 2012), and various theoretical frameworks have been suggested (see for instance Motowidlo, 1996).

Further, prompted by the changing age profile of the global work force, researchers have also become increasingly interested in whether employees’ attitudes change as they grow older. Knowledge about age-attitudes

relationships can improve our understanding of differences between younger and older workers in terms of productivity and/or work role engagement (Ng & Feldman, 2010). Some research indeed indicates that age relates positively to a number of work attitudes (Bernal, Snyder, & McDaniel, 1998; Ng & Feldman, 2010; Rhodes, 1983), suggesting that older employees generally tend, for example, to be more satisfied with their jobs and involved in their work compared to younger employees. Relatively little research, however, has compared work attitudes within the same individuals at different and widely-separated points in time to determine if this apparent pattern of increase can be detected *within* individuals as they get older and acquire more work experience. Moreover, the fundamental question of why work attitudes might be inclined to increase over time remains largely unresolved (Ng & Feldman, 2010).

The present study is designed to address these gaps in the literature, and reports on the results of two surveys of the same employees conducted 15 years apart in which changes in work attitudes might be attributable to changes in personal dispositions. Specifically, the primary purpose of the present study is to test whether and how changes in personality traits during adulthood predict employees' changes in two important work-related attitudes, namely job satisfaction and work involvement. Given the well-established dispositional source of attitudes, this mechanism of *correlated change between traits and attitudes* seems plausible, and has recently been put forward as a promising mechanism to account for age-attitudes relations (Ng & Feldman, 2010, p. 705). Drawing on the established Maturity Principle of personality trait change during adulthood (Caspi, Roberts, & Shiner, 2005; Roberts & Wood, 2006), we refer to this process as maturation of work attitudes.

Personality Maturation in Adulthood

The central idea in this paper is that changes in personal dispositions across adulthood can be useful for understanding concurrent changes in work-related attitudes over the same stage of time. Although various dispositional models are eligible, we think the FFM is, to date, most appropriate to examine how dispositional changes are associated with changes in work attitudes. First,

the FFM has the advantage of being the most popular and widely investigated personality taxonomy, whose traits have proven their relevance to many criteria in OB, including job attitudes, job performance, leadership, and work motivation (Judge, Heller, & Klinger, 2008). Second, FFM traits are relevant to affect-driven attitudes such as job satisfaction (e.g., Judge et al., 2002) as well as to attitudes that tap into the relative importance of work to individuals and that are more value-driven (e.g., Judge & Ilies, 2002). Finally and most importantly, given their central position in the personality literature, the long-term change trajectories of Big Five traits have extensively been documented (Roberts et al., 2006), allowing specific hypotheses concerning the effects of trait changes on attitude change.

Specifically, research in the personality development domain has now convincingly demonstrated that people display clear patterns of mean-level changes in Big Five traits across the life course, with the preponderance of change during adulthood occurring between the ages of 20 and 40 years (Roberts & Wood, 2006). Studies have particularly indicated normative increases in Agreeableness and Conscientiousness, and decreases in Neuroticism (or increases in Emotional Stability) (Lucas & Donnellan, 2011; Roberts, Walton, & Viechtbauer, 2006; Srivastava, John, Gosling, & Potter, 2003), and these age differences are now widely evidenced across most industrialized countries (Soto, John, Gosling, & Potter, 2011).

Theoretically, the trait changes described above point to increasing psychological maturity over the period from young to middle adulthood (Caspi et al., 2005; Roberts & Wood, 2006). As indicated by Caspi and colleagues (2005), two distinct definitions of maturation prevail in developmental theories. The first, humanistic definition, equates maturity with self-actualization and personal growth, and the underlying process includes becoming less defensive and rigid and more creative and open to feelings. The data, however, tend not to support this developmental progression; people do not grow increasingly open to experience toward old age; after young adulthood, they actually exhibit declines on Openness-related traits (e.g., Small, Hertzog, Hultsch, & Dixon, 2003). The second, functional approach to maturity focuses on the capacity to become a

productive and involved contributor to society. From an observer's perspective, functional maturity concerns the degree to which a person is liked, admired, and respected in his or her community, and this is due to three broad but indispensable characteristics (Hogan & Roberts, 2004). First, they are rewarding to deal with because they praise, support and encourage others and they maintain a positive mood. Second, well-liked people are consistent, which means that others know what to expect when they deal with them. And third, well-liked people can contribute something to their groups (e.g., as teachers, entertainers, or wise counselors). Translated into the terminology of the FFM, a mature person would be agreeable (supportive and warm), emotionally stable (consistent and positive), and conscientious (honoring commitments and playing by the rules) (Caspi et al., 2005; Hogan & Roberts, 2004; Roberts & Wood, 2006). Considering the empirical findings cited above, most people indeed appear to become more functionally mature with age, and those who develop the cardinal traits of psychological maturity earliest tend to be more effective in the tasks of social development (Caspi et al., 2005; Roberts & Wood, 2006).

Research Model and Hypotheses

Knowing that (a) work attitudes have a well-established dispositional source, and (b) that these personal dispositions continue to change across adulthood in the direction of functional maturity, the logical question now arises whether and how changes in these traits predict concurrent changes in work-related attitudes. Ng and Feldman (2010) recently suggested that increases in levels of Agreeableness and Conscientiousness over one's life course might provide an explanation for why age would be associated with more favorable attitudes concerning work (p. 705). The present study is the first to empirically challenge this idea of correlated change between dispositions and work-related attitudes using a longitudinal research design that spans the first 15 years of the professional career. This general research question, which is modeled in the middle part of Figure 1 (dotted lines), involves three testable conditions (i.e. concurrent associations, trait and attitude change, and correlated change).

Concurrent associations (Path A). The idea of maturation effects in work attitudes first requires the attitudes under study to have a significant dispositional basis. In the present study, this is tested by examining the associations between Big Five personality traits and work attitudes, both measured at the very beginning of the professional career. For job satisfaction, this mainly involves a replication of prior research examining its dispositional source (e.g., Judge et al., 2002). However, re-examining these static associations between Big Five traits and job satisfaction is necessary as they may differ depending on specific study features such as sample characteristics or specificity in measurement instruments. Establishing these concurrent associations is, hence, an imperative first step as they will form the basis for more innovative hypotheses concerning correlated change (cfr. *infra*).

For four of the five Big Five traits, grounded expectations can be generated regarding their associations with job satisfaction. Individuals high on *Neuroticism* are described as angry, embarrassed, anxious, hostile, depressed, worried, and nervous (Costa & McCrae, 1992). These characteristics are associated with a general tendency to perceive situations -including those at work- as less satisfying. In contrast, individuals high on *Extraversion* are more optimistic and fun-loving in nature (Costa & McCrae, 1992). They have more friends and spend more time in social situations than do introverts and, because of their social facility, are likely to find interpersonal interactions (such as those that occur at work) more rewarding (Watson & Clark, 1997). Agreeable individuals have a greater motivation to achieve interpersonal intimacy (McCrae & Costa, 1991), and it has specifically been argued that individuals higher on *Agreeableness* are more motivated to get along with others in a pleasant, satisfying work relationship (Organ & Lingl, 1995). In the same line, Organ and Lingl (1995) argued that higher *Conscientiousness* is associated with a greater likelihood of obtaining satisfying work rewards (formal and informal), resulting in higher job satisfaction. Finally, characteristics associated with *Openness to Experience*, such as being imaginative, curious, and broadminded (Costa & McCrae, 1992) have no prominent theoretical association with job satisfaction, and empirical research has generally failed to find a replicable association.

Taken together, the following hypothesis can be formulated regarding the static associations between Big Five traits and job satisfaction at the beginning of the career:

Hypothesis 1: Levels of job satisfaction at the beginning of the career are expected to be positively associated with initial levels of Extraversion, Agreeableness and Conscientiousness. Conversely, a negative association is expected with initial scores on Neuroticism. The association with Openness to Experience is examined on exploratory grounds.

There are considerable indications that Conscientiousness, Extraversion and Openness to Experience should positively relate to work involvement. Individuals who score high on *Conscientiousness* have a strong sense of duty towards every role they engage in including the work role (Organ & Lingl, 1995), and Diefendorff, Brown, Kamin and Lord (2002) reported positive correlations between Conscientiousness and job involvement and work centrality. Similarly, *Extraversion* has been shown to be positively related to work performance motivation (Judge & Ilies, 2002). Hence, extraverts are more likely to possess the need to occupy a central position in their work environment so they can satisfy their ambitious and domineering tendencies. Finally, individuals high on *Openness to Experience* may tend to report higher levels of work involvement, as work can serve as an arena to entertain their curiosity, their appetite for exploring new perspectives, and their tendency to develop genuine interests for any activities that they engage in. This is supported by empirical research that reports a positive relationship between Openness and work drive (Lounsbury, Sundstrom, Loveland, & Gibson, 2003).

For Neuroticism and Agreeableness, research findings suggest a negative association with work involvement. First, given their lack of confidence and optimism, individuals high on *Neuroticism* are less likely to develop ambitions regarding their careers and to set performance and career goals accordingly. Research has, for example, demonstrated a negative association between Neuroticism and work performance motivation (Judge & Ilies, 2002). With regard to *Agreeableness*, research has identified a significant negative

relationship with the objective accomplishments over the course of one's career (e.g., Judge, Higgins, Thoresen, & Barrick, 1999). In this regard, it has been argued that, because of their altruism and modesty, individuals high on Agreeableness prioritize relationships with others over work and career success. Hence, they should also be less likely to report high levels of involvement in their work. Taken together, the following hypothesis can be formulated regarding the static associations between Big Five traits and work involvement at the beginning of the career:

Hypothesis 2: Levels of work involvement at the beginning of the career are expected to be positively associated with initial levels of Extraversion, Openness to Experience and Conscientiousness. Conversely, a negative association is expected with initial scores on Neuroticism and Agreeableness.

Personality trait and attitude changes (Paths B and C). The idea that functional maturation in personal dispositions triggers changes in work attitudes further requires dispositions, here Big Five personality traits, to change over time (*Path B*). Consistent with the findings on personality trait change cited above, the following hypothesis can be formulated:

Hypothesis 3: During the 15-year period from young to middle adulthood, we expect individuals to increase in scores on Agreeableness and Conscientiousness, and to decrease in scores on Neuroticism.

Note that for Openness to Experience and Extraversion the change patterns during this specific stage of life are less univocal (Roberts et al., 2006). Therefore, change in Openness and Extraversion will be examined on exploratory grounds.

Although recent studies have started to investigate changes in work attitudes (e.g., Boswell, Shipp, Payne, & Culbertson, 2009; Vandenberghe, Panaccio, Bentein, Mignonac, & Roussel, 2011), to date no prior research has examined within person changes across a time span that is sufficiently large to observe maturation effects. To the extent that the significant positive

correlations between age and job attitudes reported previously (Ng & Feldman, 2010) indicate true within-person changes, the following hypothesis can be formulated regarding long-term attitude change (*Path C*):

Hypothesis 4: Job satisfaction and work involvement are expected to increase over the first fifteen years of the professional career.

Correlated change between traits and attitudes (Path D). Finally and perhaps most importantly, maturation of work attitudes requires trait changes to be associated with changes in work related attitudes. Recent findings in aging and personality literatures have provided strong evidence for the existence of interindividual differences in trait change (Allemand, Zimprich, & Martin, 2008; Branje, Van Lieshout, & Gerris, 2007; Hudson, Roberts, & Lodi-Smith, 2012; Small et al., 2003). Apparently, not everyone demonstrates the change patterns described above to the same extent, or even in the same direction. Instead, there is significant and substantial variation in trait change across individuals, and demonstrating that these interindividual differences in personality change are related to interindividual differences in attitude change offers a strong test of what can be called maturation of work attitudes.

How should this pattern of correlated change between dispositions and attitudes look like? The most logical expectation is that attitudes change under the influence of those traits that constitute their dispositional source. It is, hence, most logical to expect the patterns of correlated change to mirror the static associations between traits and attitudes. This specifically means that (a) correlated change is restricted to those traits and attitudes that also showed significant static correlations at the beginning of the career, and (b) that the sign of correlated change is in concordance with the sign of the static correlation. If, for example, Conscientiousness is positively related to early career work involvement, than increases in Conscientiousness should be related to increases in work involvement. Conversely, if Neuroticism is negatively related to job satisfaction, than decreases in Neuroticism should be related to increases in job satisfaction. Based on this principle, the following hypothesis is proposed:

Hypothesis 5: The pattern of correlated change between traits and attitudes will mirror the static correlations at the beginning of the career.

Reciprocal relations (Paths E and F). So far in this paper, we have implicitly assumed that correlations between changes in traits and changes in attitudes are indicative of an underlying process (i.e. maturation of work attitudes) that is elicited by trait change, and not vice versa. This is conceptually consistent with the traditional perspective in the OB literature of traits as independent variables, influencing relevant outcomes such as work performance (e.g., Neal, Yeo, Koy, & Xiao, 2012) or attitudes (e.g., Heller, Judge, & Watson, 2002). Empirically, however, findings regarding correlated change remain essentially correlational, and, hence, inferences regarding the direction of influence should be made with caution. Moreover, there is now increasing evidence that personality development is -at least partially- influenced by our social environment, including our experiences at work (Hudson et al., 2012; Roberts, Caspi, & Moffitt, 2003). This is incorporated in neo-socioanalytic perspectives on personality (Roberts & Wood, 2006; Roberts, Wood, & Smith, 2005), which now acknowledge that personality trait development and work-related experiences are in constant transaction. In order to address this issue of bi-directionality and to obtain some directional information, our research model also contains the prospective effects of personality trait levels on subsequent change in work attitudes (*Path E*) as well as the effects of initial work attitudes on personality trait change (*Path F*) (Beyers & Goossens, 2008; Hudson et al., 2012). If, for instance, we should only find trait effects on change in attitudes and no reciprocal effects, then this would support any inferences about the pattern of correlated change being mainly induced at the dispositional side. The existence of reciprocal effects, on the contrary, would indicate that patterns of correlated change between traits and attitudes are best interpreted as a bidirectional processes. This translates into the following research question:

Research question: Is there any evidence for bi-directionality in the longitudinal associations between Big Five personality traits and work attitudes across the first 15 year of the professional career?

Method

Design and Participants

To examine these research questions and hypotheses, data are used from a longitudinal research program on personality development and work-related experiences in a Flemish college alumni sample (De Fruyt, 2002; De Fruyt & Mervielde, 1999; Wille, De Fruyt, & Feys, 2010, 2012). For the present study, assessments of personal dispositions and work attitudes at the very beginning of the professional career are related to measurements of the same variables assessed 15 years later. This longitudinal design allows us to examine both cross-sectional relationships between the variables, as well as change in the variables over time.

In 1994 (T1), a large sample of 934 final year college students from various disciplines enrolled in this longitudinal research program by filling out extensive personality questionnaires three months prior to graduation (for a thorough description of the sample, see De Fruyt & Mervielde, 1999). One year later (1995), a first follow-up was conducted, focusing on initial work experiences (including work attitudes) in a subsample of 612 college alumni. For the purpose of the present study, these initial personality and attitude assessments are considered as (Time 1; T1) measures reflecting scores at the beginning of the professional career. In the spring of 2009 (Time 2; T2), exactly 15 years after the first assessment, a second follow-up of the sample was organized to re-assess participants' personality traits and work attitudes. Data were collected through an online survey conducted in the context of a college alumni project (for a thorough description of the procedures that were followed, see Wille, De Fruyt, & De Clercq, in press). Although previous studies have used data from this longitudinal research project to document the predictive validity of personality traits for career trajectories (Wille, Beyers, & De Fruyt, 2012; Wille et al., 2010) and outcomes (Wille et al., in press; Wille, De Fruyt, et al., 2012), the present study is unique in that it examined correlated changes and reciprocal effects between traits and attitudes over the 15-year time interval.

The issue of dropout is inherent to longitudinal studies, especially when time intervals are large. Data could be included in this study from 504 (280

males and 224 females) college alumni who completed at least one of both personality assessments (1994 or 2009) *and* at least one of both work attitude measures (1995 or 2009). Each of these 504 participants provided valid and complete personality assessments at T1, so we could examine if and to what extent this subsample differs from the original sample of 934 in terms of baseline personality traits. Independent sample t-tests indicated that “continuers” ($n = 504$) scored significantly lower than “dropouts” ($n = 430$) on T1 Neuroticism, ($t(932) = 2.96, p < .01$), and significantly higher on T1 Conscientiousness ($t(932) = -4.00, p < .001$). Associated effect sizes indicate small to medium differences between both subsamples for these traits ($d = .19$ and $-.26$ respectively). No significant differences were observed between both samples for the other baseline personality traits. Further, of the 934 participants that provided personality reports at T1, a subsample of 381 also reported on their work attitudes at the beginning of their career. Non-respondents ($n = 553$) either dropped out of the study or were not yet employed at the time of the assessment, thus also unable to report on work attitudes. Each of these 381 participants were included in the subsample of 504 that was used for the present study. Again, it was checked whether and how these 381 “continuers” differ from the “dropouts” ($n = 553$) in terms of baseline personality traits. We found continuers to score significantly higher on Conscientiousness ($t(932) = -4.24, p < .001, d = -.29$) and lower on Neuroticism ($t(932) = 3.32, p < .01, d = .22$) compared to dropouts. In addition, continuers also scored significantly higher on Extraversion ($t(932) = -2.58, p < .05, d = -.17$) and lower on Openness to experience ($t(932) = 2.30, p < .05, d = .15$). Together, these results indicate that the selected sample of 504 participants differs to some extent from the original sample in terms of baseline personality traits, although selectivity in dropout was generally modest. The mean age of the 504 included participants was 22.44 ($SD = 1.73$) at T1 and 37.60 ($SD = 1.71$) at T2.

Measures

Personal dispositions. At both measurement occasions, participants were administered the Dutch authorized adaptation of the NEO PI-R (Costa &

McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996) to measure Big Five personality traits on a five-point scale. The NEO PI-R is a comprehensive personality questionnaire, measuring five global and 30 more specific traits (six facets for each of the Big Five domains).

Work attitudes. The Dutch translation of the Career Attitudes and Strategies Inventory (CASI; De Fruyt, 2002; Holland & Gottfredson, 1994) was used to measure work attitudes at T1 and T2. The CASI provides an assessment of an individual's views and strategies concerning his or her career by means of nine scales (i.e. Job Satisfaction, Work Involvement, Skill Development, Dominant Style, Career Worries, Interpersonal Abuse, Family Commitment, Risk Taking, and Geographical Barriers). For the purpose of the present study, the two CASI-scales were selected that measure work attitudes common in the OB literature. The *Job Satisfaction scale* contains 21 items which assess contentment with one's current occupation. Example items include 'My job provides a feeling of accomplishment' and 'I am bored with my job' (reverse-scored). The *Work Involvement scale* consists of 12 items which assess an employee's level of devotion to his or her work, with high scores indicating greater commitment. Example items include 'Work is the major part of my life' and 'I don't like to be away from my job for more than a few days at a time'. All items were presented as declarative statements to which participants responded on a five-point scale ranging from *totally false* (1) to *totally true* (5). Internal consistencies (Cronbach alpha), intercorrelations and sample sizes are reported in Table 1. Pairwise sample sizes indicate a large amount of missing values, with only 125 out of 504 (= 24.8%) complete cases. The way these missings are handled is discussed in the statistical analyses section below.

Statistical Analyses

Latent Change Models (LCMs; McArdle & Nesselroade, 1994) were first used to model change in personality traits and work attitudes separately over time. These longitudinal factor models illustrated here in Figure 1 consist of a relatively standard specification of factors at two or more occasions of measurement (Hertzog & Nesselroade, 2003). For each variable, occasion-

specific factors are first specified using a set of observed indicators. The model typically assumes that the same configuration of relationships between observed variables and latent variables exists at both points in time. For the present study, latent variables were constructed at each time point to represent individuals' personality and attitude scores. Latent work attitude variables (lower half of Figure 1) were created by parceling the CASI items within each attitude scale. Parcels tend to be more reliable and more normally distributed compared to single items and are thus better at meeting the assumptions of maximum likelihood estimation (Allemand, Zimprich, & Hertzog, 2007; Jackson et al., 2009). Additionally, parcels reduce the number of estimated parameters and, therefore, reduce the complexity of the second order latent change model, resulting in better model fit. Selecting the three highest loading items from a factor analysis created three parcels. These three items anchored each of the three parcels. The remaining items were distributed into each parcel by adding the fourth highest loading to the first parcel, the fifth highest to the second parcel, and so on until all the items were allocated (Little, Cunningham, Shahar, & Widaman, 2002). For the latent personality factors (upper half of Figure 1), NEO PI-R facet scores (6 per Big Five domain) were used as observed indicator variables.

The latent change model was then used to restructure the occasion-specific factors in terms of latent level and change factors. To that end, each latent variable is extended by a fixed-1 regression coefficient to its corresponding level factor, and each latent variable at the second occasion of measurement is used to define a latent change variable. The residual variance of the occasion-specific factor is fixed to zero.

The chief advantage of latent change analysis over the more frequently used autoregressive models is that initial level and change are directly estimated as latent variables, with associated latent variable means and variances. Rejecting the null hypothesis of zero variance indicates that there are reliable individual differences in trait or attitude change between both measurement occasions (Hertzog & Nesselroade, 2003). Another attractive feature of these LCMs is that they can be used in multivariate structural models in which change

in one variable is related to change in another, enabling the study of correlated change (Allemand et al., 2008; Beyers & Goossens, 2008; Hertzog, Dixon, Hultsch, & MacDonald, 2003; Hudson et al., 2012). Finally, LCMs are tolerant of missing data, thereby allowing researchers to use more of the available data, rather than only complete data. In the present study, missings in our sample of 504 college alumni almost exclusively reflected wave nonresponse (Schafer & Graham, 2002). At T1, personality and attitude data were gathered with a 1-year time interval in between; and survey participation at T2 was allowed even if participants had not completed the initial attitude-assessment.

Schafer and Graham (2002) recommend the use of Maximum Likelihood (ML) estimation procedures that take into account all the available data for each participant, so that missing information can then be partially recovered from earlier or later waves (see also Schafer, 1997). To justify the use of ML estimation, however, the data should be missing (completely) at random (MCAR), which can be tested using Little's (1988) multivariate test implemented in the SPSS Missing Value Analysis module.

When applied to the observed indicator scores (i.e. attitude parcels and personality facets) of the 504 participants included in this study, Little's test revealed missingness to be completely at random ($\chi^2 = 220.57$, $df = 204$, $p > .05$), showing that the probability of nonresponse (or dropout) in this subsample is unrelated to any of the assessed study variables. This allowed us to conduct the LCM-analyses on the entire sample of 504 participants, using the Full Information Maximum Likelihood (FIML; Schafer & Graham, 2002) approach to deal with these missings. FIML is a pragmatic missing data estimation approach for structural equation modeling which has been shown to produce unbiased parameter estimates and standard errors under MCAR. This procedure was preferred over alternatives such as those using only complete case data or data imputation (e.g., expectation maximization), both of which can lead to biased estimates (Wothke, 2000). Specifically, this approach better represents the entire sample rather than just the subsample of alumni who have no missing data while still providing appropriate tests of statistical significance that reflect the amount of missing data for each variable. Note that although we argued a

priory for the superiority of the FIML approach, these results were very similar to unreported results based on complete cases only, further substantiating the randomness of missings. For FIML analyses, LISREL (Jöreskog & Sörbom, 2004) provides only the root mean square error of approximation (*RMSEA*) to evaluate goodness of fit. The main focus in the present study is on the evaluation of parameter estimates.

Latent change analyses were done in three steps. First, a series of seven univariate LCMs were conducted for each of the focal variables (five personality traits and two work attitudes) separately in order to evaluate important parameter estimates including latent factor means and variances. Next, a total of ten multivariate structural equation models (two attitudes x five traits) were tested to simultaneously estimate the latent correlations between levels at T1 of personality and work attitudes (Path A in Figure 1), the simultaneous latent change between personality and work attitudes (Path D in Figure 1), as well as the prospective relations between levels at T1 and change over time (Paths E and F in Figure 1). All latent variable analyses were conducted using LISREL8.72 (Jöreskog & Sörbom, 2004).

Results

Latent Changes in Dispositions and Attitudes

As can be seen in Table 2, the LCMs for each of the seven focal variables produced good to acceptable fit indices, with *RMSEAs* varying from .03 to .08 (Browne & Cudeck, 1993). The results further reveal a number of important basic characteristics of the latent changes in personal dispositions and work attitudes over the 15-year interval. In accordance with our expectations, significant mean-level increases in Conscientiousness ($M = .26, p < .001$) and Agreeableness ($M = .08, p < .01$) were observed, whereas participants on average decreased in Neuroticism ($M = -.30, p < .001$). A significant mean-level decrease in Openness to Experience over time was also found ($M = -.19, p < .001$). Finally, the mean change in Extraversion was nonsignificant ($M = -.05, p > .05$). Turning to the work attitudes, our results indicated no significant mean changes across 15 years, although there was a general *tendency* for individuals

to increase in job satisfaction and work involvement ($M = .07$ and $.10$ respectively, $p > .05$). In addition to these mean-level changes, Table 2 also shows significant variances (s^2) in the latent change parameters associated with each of the personality traits and work attitudes, indicating significant interindividual differences in change. Finally, the negative correlations between level and change factors indicate that higher scores on trait and attitude levels at the beginning of the career are associated with smaller increases (for Agreeableness, Conscientiousness, job satisfaction, and work involvement) or larger decreases (for Neuroticism, Extraversion, and Openness) over the next 15 years.

Previous research has demonstrated systematic differences between men and women in terms of both personal dispositions (e.g., McCrae & Terracciano, 2005) and work attitudes (Lyness & Thompson, 2000). In the latent change analyses, we also explored whether and how gender related to levels and changes in personality traits and attitudes. With regard to the initial levels, we found women to score significantly higher than men on Neuroticism ($r = .26$, $p < .001$), Extraversion ($r = .13$, $p < .05$), Openness ($r = .25$, $p < .001$) and Agreeableness ($r = .27$, $p < .001$), whereas men scored significantly higher on Conscientiousness ($r = -.12$, $p < .05$) and work involvement ($r = -.20$, $p < .01$). Further, two significant gender differences were observed with regard to the latent change parameters. Women demonstrated stronger increases in Agreeableness ($r = .16$, $p < .05$) compared to men and men in turn showed stronger increases in work involvement ($r = -.21$, $p < .01$) compared to women. Overall, these standardized estimates indicate small to medium effects sizes. Nonetheless, gender effects were controlled for in all multivariate structural equation models. This was accomplished by adding gender into the model as an exogenous variable that simultaneously predicted personality level and change *and* attitude level and change.

Associations between Dispositions and Attitudes over Time

The results of ten multivariate structural equation models, examining the associations between dispositions and attitudes over time, are reported in Table

3. These combined LCMs yielded good to acceptable model fits, with *RMSEA* varying from .04 to .07. Consistent with our expectations, a number of significant relationships were first found between initial disposition levels and work attitudes at the beginning of the career (see columns “ $D \leftrightarrow A$ ”). As expected, job satisfaction levels were positively associated with initial levels of Extraversion ($r = .14, p < .05$), Agreeableness ($r = .19, p < .01$) and Conscientiousness ($r = .24, p < .001$), and negatively with initial Neuroticism ($r = -.22, p < .001$). For early career work involvement, only the positive association with initial Conscientiousness ($r = .28, p < .001$) and the negative association with initial Agreeableness ($r = -.14, p < .05$) were significant.

These structural equation models further provided substantial evidence for correlated change between traits and attitudes, particularly with regard to job satisfaction (see columns “ $\Delta \leftrightarrow \Delta$ ”). The results specifically demonstrated that changes in job satisfaction were negatively associated with changes in Neuroticism ($r = -.30, p < .001$) and positively with changes in Extraversion ($r = .22, p < .001$) and Conscientiousness ($r = .29, p < .001$). Stronger increases in job satisfaction were, thus, associated with stronger decreases in Neuroticism and stronger increases in Extraversion and Conscientiousness. Change in work involvement was only significantly correlated with change in Agreeableness ($r = -.19, p < .01$), indicating that stronger increases in Agreeableness were associated with smaller increases in work involvement. Note that these patterns of correlated change between personal dispositions and attitudes largely mirrored the pattern of static level associations between both, as hypothesized. Of the six level-associations that were identified, four also resulted in significant correlations between the change factors; correlations that were, moreover, in the expected direction. Nonetheless, for two trait-attitude combinations, the pattern of correlated change diverged from the established static correlations. First, although early career job satisfaction was positively associated with levels of Agreeableness, no significant correlation between these change factors was found ($r = .01, p > .05$). Similarly, although early career work involvement was positively associated with levels of Conscientiousness, change in

Conscientiousness was not significantly related to change in work involvement ($r = .08, p > .05$).

Inspection of the reciprocal effects in the multivariate structural equation models first indicates that for three of the four instances of correlated change, more evidence was found for traits affecting change in attitudes (columns “ $D \rightarrow \Delta A$ ”) than vice versa (columns “ $A \rightarrow \Delta D$ ”). Increases in job satisfaction were positively predicted by initial levels of Extraversion ($\beta = .16, p < .01$) and Agreeableness ($\beta = .13, p < .05$), and negatively predicted by initial levels of Neuroticism ($\beta = -.16, p < .01$). Increases in work involvement were negatively predicted by initial levels of Agreeableness ($\beta = -.16, p < .01$) and Openness ($\beta = -.15, p < .05$). Importantly, however, we found a stronger effect of early career job satisfaction on subsequent change in Agreeableness than vice versa ($\beta = .24, p < .001$ vs. $\beta = .13, p < .05$), indicating that reverse effects (i.e. from attitude levels on change in dispositions) could not be ruled out entirely.

Discussion

Reviews of the literature have indicated that age-related differences exist for some of the most prominently studied work-related attitudes, including job satisfaction and indicators of work involvement (Ng & Feldman, 2010). However, at this time there is limited knowledge as to why these differences exist. Do these age-attitude correlations truly reflect intraindividual changes; and, if so, can these changes be better understood in terms of underlying psychological developmental processes? The main reasons for this lack of understanding stem from the fact that issues regarding aging effects on attitudes have almost exclusively been examined indirectly, that is by relying on cross-sectional associations between attitudes and chronological age. Although there are general life-span theories, including perspectives on personality maturation (e.g., Roberts & Wood, 2006), that can account for (at least some) within individual changes in attitudes, there is a lack of innovative studies that examine and explain intraindividual changes in work attitudes and its antecedents across longer periods of time (Schalk, van der Heijden, de Lange, & van Veldhoven, 2011). The present study was designed to address these gaps in the literature.

We first attempted to replicate the dispositional source of both work attitudes as reflected in the static associations at the beginning of the career. Associations between Big Five traits and job satisfaction were entirely in line with what had been demonstrated by previous research (e.g., Judge et al., 2002). For work involvement, two of the five hypothesized associations with Big Five traits revealed to be significant. Highly agreeable individuals, demonstrating high levels of altruism and modesty, also reported lower levels of work involvement. Highly conscientious individuals, on the other hand, characterized by strong ambition and perseverance, indicate higher levels of work involvement.

Next, we inspected the within-individual changes of dispositions and attitudes over the 15-year time interval. With regard to Big Five traits, LCMs clearly demonstrated normative changes in accordance with the literature on personality development (e.g., Roberts & Wood, 2006). As individuals grow older, they become more emotionally stable (decrease in Neuroticism), milder (increase in Agreeableness), and more conscientious. On average, we also found participants in our sample to decrease in Openness to Experience during the transition from young to middle adulthood, whereas this decline has typically been observed later in adulthood in previous studies (Roberts & Mroczek, 2008).

It has remained an unanswered question up until now if the previously reported associations between age and job attitudes (e.g., Ng & Feldman, 2010) reflect true within-person changes. When examined at the mean-level, our results however failed to indicate normative changes in work attitudes. Although we identified an expected tendency in our employee sample to become more satisfied and involved in their work, this failed to reach statistical significance. Importantly, the latent change analyses also indicated significant variation *between* individual employees with regard to intraindividual changes, which can nullify or attenuate changes at the mean-level. For dispositions as well as work attitudes, such variation indicates that not everyone follows these normative changes to the same extent, or even in the same direction. This finding moreover opened the door for examining patterns of correlated change between traits and

attitudes. Consistent with what we expected, most of the level associations between traits and attitudes came back when looking at the correlations between change factors.

Although we found ample evidence that changes in attitudes correlated with changes in dispositions, this finding is nonetheless correlational and subject to a number of limitations. Chief among these is that we cannot infer the direction of the effects between change factors. For example, do employees increase in job satisfaction due to their tendency to become more emotionally stable over time; or is it the increase in job satisfaction that generalizes to people's dispositional make-up and that consequently drives them toward greater emotional stability? To further clarify these patterns of correlated change, we also examined the prospective effects of initial personality levels on changes in attitudes and vice versa. Most evidence was found for traits influencing subsequent change in attitudes. Increases in job satisfaction were predicted by initial levels of Neuroticism, Extraversion and Agreeableness. These findings are consistent with earlier theorizing about the role that employee dispositions play in the development of work attitudes. Specifically, individuals with pleasant dispositions are expected to seek out, be sensitive to, and remember the positive aspects of their work environment (Bowling et al., 2006). Despite the fact that Openness has been shown to be positively related to work drive (Lounsbury et al., 2003), our results indicate that individuals high on Openness, who are characterized by broad interests (also outside the work domain), have smaller increases in work involvement compared to people low on Openness. Finally, our results also show that highly agreeable individuals, who tend to prioritize relationships with others over attaining work and career success (e.g., Judge et al., 1999), demonstrated smaller increases in this work attitude over time. Note that of the ten trait \times attitude combinations, we only found one significant effect of attitude-levels (i.e. job satisfaction) on trait changes (i.e. Agreeableness). This directional information is an important indication that maturation of work attitudes is dispositionally induced, although reciprocity cannot be fully excluded.

Implications for Theory and Research

In essence, the present study re-visited the dispositional perspective on work attitudes, a topic that has received a lot of attention in the OB literature over the past decade (see for instance Staw & Cohen-Charash, 2005). To date, empirical evidence for the dispositional source of work attitudes has been derived from two categories of studies (Judge & Larsen, 2001). In a first, indirect series of studies a dispositional basis of work attitudes has been derived from findings on the long-term stability of attitudes (e.g., Staw, Bell, & Clausen, 1986; Staw & Ross, 1985; Steel & Rentsch, 1997). A second, more direct series of studies argued for a dispositional basis of work attitudes by actually measuring personal dispositions and testing cross-sectional and preferably prospective associations with important work-related attitudes, such as job satisfaction and work involvement (e.g., Bowling et al., 2006; Judge, Heller, & Klinger, 2008). The present study took this direct approach a step further and introduced the issue of change into this line of research and thinking. In essence, our results demonstrated that attitudinal instability not necessarily pleads against the dispositional perspective on work-related attitudes, as change in dispositions and change in attitudes can be related.

Moreover, we used such findings to shed a light on potential age effects on work attitudes. Psychological aging has been proposed as one of the factors causing age-related differences in work attitudes in early (e.g., Rhodes, 1983) and more recent reviews (e.g., Ng & Feldman, 2010) of this topic. The theoretical contributions of the present study in this regard are twofold. First, our study indicates how age and its effect on work attitudes can be better understood psychologically. We specifically conceptualized psychological aging as (functional) maturation of personality traits, a principle that has been extensively documented in the current personality literature and that moreover can be traced back to prominent psychological theory (Hogan & Roberts, 2004). Freud described maturity in terms of the capacity to love and to work and argued that increasing levels of self-acceptance and self-control make this possible. G. H. Mead defined maturity in terms of the ability to interact with a wide range of people and to be socially appropriate without being supervised. As Roberts and

colleagues (Caspi et al., 2005; Hogan & Roberts, 2004; Roberts & Wood, 2006) summarized, this functional perspective on maturity aligns with the observed tendency of people to increase in Agreeableness, Conscientiousness, Emotional Stability, and certain aspects of Extraversion across young to middle adulthood, normative changes that were also established in the present study.

Given the well-known dispositional source of work attitudes, we hypothesized that this principle of personality maturation would also be reflected in the long-term changes in work attitudes, a principle we labeled *maturation of work attitudes*. Our results indicated that, at least for job satisfaction, this indeed seems to be the case. As individuals became more optimistic and emotionally consistent (increases in Extraversion and decreases in Neuroticism) and acquired a more responsible and reliable mind set (increases in Conscientiousness), they simultaneously increased in job satisfaction. For work involvement, however, at first sight our findings did not entirely match with this idea of functional maturity. We specifically found that stronger increases in Agreeableness were associated with smaller increases (or even decreases) in work involvement, which might be seen as contrary to the idea of a “successful contributor to society” as advocated in the functional perspective on maturity. One important nuance, however, is that functional maturity is defined in terms of successful investment in work *and* non-work (e.g., romantic) domains, and that our measure of work involvement taps into the trade-off between both. Higher scores on items such as “*My work is more important to me than my nonwork life*”, “*Work is the major part of my life*”, and “*My work comes before my family or partner*” may not only signal high levels of devotion to career, but also “unsuccessful” or restrained investment in other important life domains, such as family life. Conversely, individuals scoring lower on these items indicate or at least pursue a better (i.e. more successful) balance between work and nonwork life domains. From this perspective, our finding that stronger increases in Agreeableness are associated with smaller increases in work involvement (as we assessed it), can be considered consistent with the idea of functional maturity after all. As individuals evolve from a competitive toward a

more accommodating interpersonal mindset, work also becomes less preoccupying in their lives.

Another theoretical contribution of this study pertains to the fact that we also found evidence for work experiences (i.e. job satisfaction) to influence change in personal dispositions (i.e. Agreeableness). Although personal dispositions are typically conceptualized as stable traits by organizational researchers, personality theorists are paying increasing attention to the way that traits change over time through their interaction with life experiences (Roberts & Mroczek, 2008; Roberts & Wood, 2006). One of the central ideas in the neo-socioanalytic theory of personality development is that investment in social institutions, including establishing a successful and satisfying career, is one of the driving mechanisms of personality development (Lodi-Smith & Roberts, 2007). Further evidence for this contextual perspective on personality has also been provided by Wu and Griffin (2012) who demonstrated reciprocal associations between job satisfaction and core self-evaluations. Together, these findings suggest that theory in organizational research would benefit from an alternative perspective on personality in which traits are more considered as open and dynamic systems that can be influenced at any age in response to and together with environmental experiences. This Plasticity Principle (see Roberts, 1997) complies more with these kinds of research results than the traditional definition of traits as invariant or essentially “fixed” seems to do.

Finally, we extended the idea of changes in personality traits underlying changes in work attitudes by acknowledging *interindividual differences in long-term changes*. Over the past 10 years, a growing number of researchers have placed the concept of individual differences in change -a cornerstone of lifespan-developmental theory (Baltes & Nesselrode, 1973)- front and center in the study of personality development (Mroczek & Spiro, 2003; Roberts, 1997). This new perspective holds that personality change (and stability) is an individual-differences variable and that a complete understanding of personality development is only possible if individual differences in trait-change are examined alongside more traditional indices of development. The results of the present study show that this perspective is important in enhancing our

theoretical understanding of long-term changes in work attitudes. While we could not find significant mean-level increases in satisfaction and involvement, within-individual change varied substantially between individuals; variation that was also related to variation in trait change.

Implications for Practice

Where our study differs from prior research that examined change in work attitudes (e.g., Boswell et al., 2009), is that it focused on changes in the long-term. We believe that it is valuable for organizations to know about such processes. Data from the Retirement History Survey, for example, show remarkable stability in the prevalence of long-term employment in the United States (Stevens, 2008). In 1969, the average tenure for men in the job they held for the longest period during their careers was 21.9 years. In 2002, the comparable figure was 21.4 years. Many employees stay faithful to their organization and vice versa. As such, for many employees their organization is a place where they spend a great deal of time in their life; it is a place where they work, live, and mature. For practitioners, the key message of the present study would be that change happens. Maturity entails movement toward some ideal endpoint, and it remains an open question when that point is reached. In the present study, changes in personal dispositions in the direction of greater maturity were observed between the ages of 22 and 37 years, and other research suggests that traits continue to change later in adulthood even up until old age (Allemand, Zimprich, & Martin, 2008). This implies that personality traits are not necessarily destiny, although they can cause significant problems if left unevaluated and unmodified (Hogan & Roberts, 2004).

How can organizations and HR practitioners use our findings? First, trait effects on change in attitudes are relevant for programs of career planning and career coaching. Knowing, for example, that employees who score high on Openness at the beginning of the career may gradually develop lower levels of work involvement relative to low scorers may be useful knowledge when outlining individual career paths. Probably, these individuals may not be looking for career trajectories characterized by steep increases in corporate

responsibilities, as opposed to for instance individuals lower on Agreeableness. We would encourage personnel managers to discuss these options during career planning programs organized at the start of the career. As another example, we found that individuals initially high on Neuroticism demonstrated more negative changes in job satisfaction over the course of the next 15 years. This suggests that monitoring more neurotic employees' work experiences at intermediate coaching sessions may be important in managing their morale and satisfaction levels.

The reverse mechanism, i.e. the potential for work experiences to influence personal dispositions also holds important practical implications for organizations. In addition to the traditional dispositional perspective that it is appropriate to select employees with valuable personality traits (e.g., Judge, 2009), these kinds of results support the potential to cultivate employees' dispositions by enhancing positive work experiences. It may be important, for instance, for organizations to identify employees experiencing negative attitudes or emotions at work, as this might pervade their dispositional make-up. Together with other recent work (Wu & Griffin, 2012), this study informs personnel practitioners about the potential malleability of important personal dispositions (i.e. Big Five traits and CSE) in conjunction with and in response to work experiences. We therefore propose tracking and monitoring employees' dispositions, needs, expectations and work experiences at intermediate time points, for example in the context of career coaching programs. Hereby, we would argue for an idiographic (instead of nomothetic) approach: just as all employees are unique individuals, they also demonstrate distinctive change patterns across the life course, including vocational life. When the focus is on work attitudes, a valuable approach may be to conduct needs assessments that address observed differences among individuals and develop interventions based on characteristics identified through this process. This evidence-based strategy is a proven way to deal with individual differences rather than relying on unsubstantiated generalizations about entire groups of employees based on age groups (Costanza, Badger, Fraser, & Severt, in press).

Limitations and Future Research

Although our cross-lagged panel design provided a strong methodology to investigate correlated change between personal dispositions and work-related attitudes, it also has some limitations. First, although latent change analysis is a powerful technique to model change in two-wave panel designs (Hertzog & Nesselroade, 2003; McArdle & Nesselroade, 1994), it is also limited in that it implicitly assumes linear change between both measurement occasions. Three-wave studies, enabling latent growth curve analysis, would also allow the inspection of nonlinear patterns in trait and attitude change. Second, the availability of more than one repeated measurement of traits and attitudes would have allowed more grounded inferences regarding the precise reciprocal effects between both sets of variables (Ferrer & McArdle, 2003).

A major contribution of the present study is that it was the first to explicitly test one specific theoretical mechanism underlying long-term changes in work attitudes, i.e. personality maturation. This study was limited in that no “external mechanisms” were investigated, such as environmental changes over time. It is common knowledge that job characteristics can also affect a broad range of employee attitudes including satisfaction and involvement (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Moreover, as employees grow older and progress through their careers, their jobs may be characterized by a greater degree of autonomy, skill variety, and task significance; objective job characteristics that are positively related to such work-related attitudes (Fried & Ferris, 1987). However, although we acknowledge the possibility that long-term changes in attitudes can also be caused –in part– by changes in situational characteristics, this does not imply that our results concerning the correlated change between attitudes and dispositions are spurious. Objective job characteristics (e.g., autonomy, variety, significance), or changes therein, may cause work attitudes to change, but their capability to induce trait change is far less supported. Sutin and Costa (2010), for example, examined the reciprocal relations between Big Five traits and these objective features and found none of the job characteristics to predict change in personality. This strengthens our conclusion that correlated change between dispositions and attitudes indeed

reflects true intraindividual maturation effects. We encourage future research to continue investigating long-term changes in work attitudes, hereby testing alternative explanatory mechanisms, including situational perspectives. Hereby, we would like to stress that dispositional and situational effects should not be seen as competing hypotheses, as both dispositional and situational factors can have substantial effects simultaneously on (change in) work-related attitudes. As Gerhart (2005) put it: “*the constraint and competing explanations ideas should be put to rest*” (p. 94).

Finally, it has to be noted that the two focal constructs (attitudes and traits) in this study were assessed using self-reports only, which may have induced common method bias. The fact that we used a longitudinal design, however, alleviates such concerns (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As indicated in the method-section, there was a one-year lag between the measurements of initial personality and attitudes. Only at Time 2, these focal constructs were assessed completely concurrently, but these intercorrelations were not used directly when testing any study hypotheses because T2-ratings were reformulated as latent change factors over 15 years.

Conclusion

In order to more accurately test potential theoretical mechanisms regarding change, it is essential to examine actual change in variables of interest by means of longitudinal research designs. This has, however, proven to be a daunting task for organizational researchers in the domain of aging. Ng and Feldman (2008), for instance, denoted that it may not be realistic to plan on a 20-year study of intraindividual changes given the pressures of academic publishing (p. 405). The present study addressed this gap in the literature by examining intraindividual maturation of employees’ attitudes and dispositions across 15 years. It is concluded that longitudinal designs are challenging to carry out, but that they also open the door for innovative progressions in this field of research. In essence, this entails a revision of the dispositional approach to work attitudes, acknowledging that dispositions continue to develop over the lifespan,

and that this maturational process influences and is influenced by work-related experiences.

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Tables

Table 1

Correlations between all study variables at both measurement occasions (T1 and T2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Gender	-														
	-														
2.Neu (T1)	.25 [†]	.92													
	(504)	(504)													
3.Ext (T1)	.03	-.30 [†]	.89												
	(504)	(504)	(504)												
4.Ope (T1)	.18 [†]	.12 ^{**}	.21 [†]	.87											
	(504)	(504)	(504)	(504)											
5.Agr (T1)	.17 [†]	-.13 ^{**}	.07	.06	.90										
	(504)	(504)	(504)	(504)	(504)										
6.Con (T1)	-.09 [*]	-.45 [†]	.17 [†]	-.18 [†]	.16 [†]	.91									
	(504)	(504)	(504)	(504)	(504)	(504)									
7.Neu (T2)	.22 [†]	.66 [†]	-.24 [†]	.06	-.17 ^{**}	-.29 [†]	.93								
	(293)	(293)	(293)	(293)	(293)	(293)	(293)								
8.Ext (T2)	.02	-.23 [†]	.67 [†]	.12 [*]	.04	.02	-.31 [†]	.90							
	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)							
9.Ope (T2)	.09	.06	.09	.63 [†]	.04	-.20 ^{**}	.11	.23 ^{***}	.89						
	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)						
10.Agr (T2)	.19 ^{**}	-.05	-.03	.11	.59 [†]	.04	-.19 ^{**}	.04	.17 ^{**}	.90					
	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)					
11.Con (T2)	-.06	-.25 [†]	.13 [*]	-.13 [*]	.03	.53 [†]	-.45 [†]	.14 [*]	-.23 [†]	.01	.91				
	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)	(293)				
12.JS (T1)	.05	-.21 [†]	.10	.00	.17 ^{**}	.19 [†]	-.17 [*]	.09	-.01	.27 ^{**}	.12	.91			
	(381)	(381)	(381)	(381)	(381)	(381)	(173)	(173)	(173)	(173)	(173)	(381)			
13.WI (T1)	-.07	-.02	.01	-.03	-.10	.24 [†]	-.01	-.06	-.03	.02	.13	.30 [†]	.77		
	(381)	(381)	(381)	(381)	(381)	(381)	(173)	(173)	(173)	(173)	(173)	(381)	(381)		
14.JS (T2)	-.07	-.24 [†]	.20 ^{**}	.00	.17 ^{**}	.11	-.42 [†]	.35 ^{***}	-.08	.15 [*]	.36 [†]	.22 [*]	.04	.92	
	(248)	(248)	(248)	(248)	(248)	(248)	(245)	(245)	(245)	(245)	(245)	(125)	(125)	(248)	
15.WI (T2)	-.17 ^{**}	.01	-.08	-.16 [*]	-.20 ^{**}	.13 [*]	.00	.01	-.12	-.23 [†]	.14 [*]	-.04	.32 [†]	.25 [†]	.82
	(248)	(248)	(248)	(248)	(248)	(248)	(245)	(245)	(245)	(245)	(245)	(125)	(125)	(248)	(248)

Note. Gender is coded 0 for men and 1 for women. Neu = Neuroticism; Ext = Extraversion; Ope = Openness to Experience; Agr = Agreeableness; Con = Conscientiousness; JS = Job Satisfaction; WI = Work Involvement. (T1) indicates that the variables are assessed at Time 1; (T2) indicates that the variables are assessed at Time 2. Pairwise sample sizes are indicated between parentheses. Internal consistencies (Cronbach alpha) are reported on the diagonal. * $p < .05$; ** $p < .01$; † $p < .001$.

Table 2

Summary statistics of Latent Change Models (LCMs) for dispositions and work attitudes

LCMs	Model fit	Latent Level		Latent Change		Level-Change
	<i>RMSEA</i>	<i>M</i>	<i>s</i> ²	<i>M</i>	<i>s</i> ²	<i>r</i>
<i>Dispositions</i>						
Neuroticism	.05	3.07	.34 [†]	-.30 [†]	.21 [†]	-.39 [†]
Extraversion	.08	3.54	.13 [†]	-.05	.09 [†]	-.37 [†]
Openness	.05	3.59	.15 [†]	-.19 [†]	.10 [†]	-.33 ^{**}
Agreeableness	.07	3.46	.12 [†]	.08 ^{**}	.09 [†]	-.49 [†]
Conscientiousness	.08	3.63	.08 [†]	.26 [†]	.07 [†]	-.48 [†]
<i>Work Attitudes</i>						
Job Satisfaction	.04	3.53	.50 [†]	.07	.65 [†]	-.68 [†]
Work Involvement	.03	2.41	.24 [†]	.10	.33 [†]	-.52 [†]

Note. ^{**} $p < .01$; [†] $p < .001$.

Table 3

Static associations, correlated change and reciprocal effects between Dispositions (D) and Attitudes (A)

Dispositions	Job Satisfaction				Work Involvement			
	D↔A	D→ΔA	A→ΔD	Δ↔Δ	D↔A	D→ΔA	A→ΔD	Δ↔Δ
Neuroticism	-.22 [†]	-.16 ^{**}	-.05	-.30 [†]	.04	.07	.04	-.02
Extraversion	.14 [*]	.16 ^{**}	-.02	.22 [†]	-.02	-.08	-.04	.08
Openness	.00	-.03	-.10	-.07	-.05	-.15 [*]	-.03	-.02
Agreeableness	.19 ^{**}	.13 [*]	.24 [†]	.01	-.14 [*]	-.16 ^{**}	.12	-.19 ^{**}
Conscientiousness	.24 [†]	.08	.05	.29 [†]	.28 [†]	.02	-.06	.08

Note. D↔A = the concurrent associations between initial disposition and attitude levels; D→ΔA = the prospective effect of initial disposition levels on change in attitudes; A→ΔD = the effect of initial attitude levels on change in dispositions; Δ↔Δ = correlated change between dispositions and attitudes. Gender is included as a control variable in these analyses. Standardized estimates are reported. * $p < .05$; ** $p < .01$; † $p < .001$.

Figure

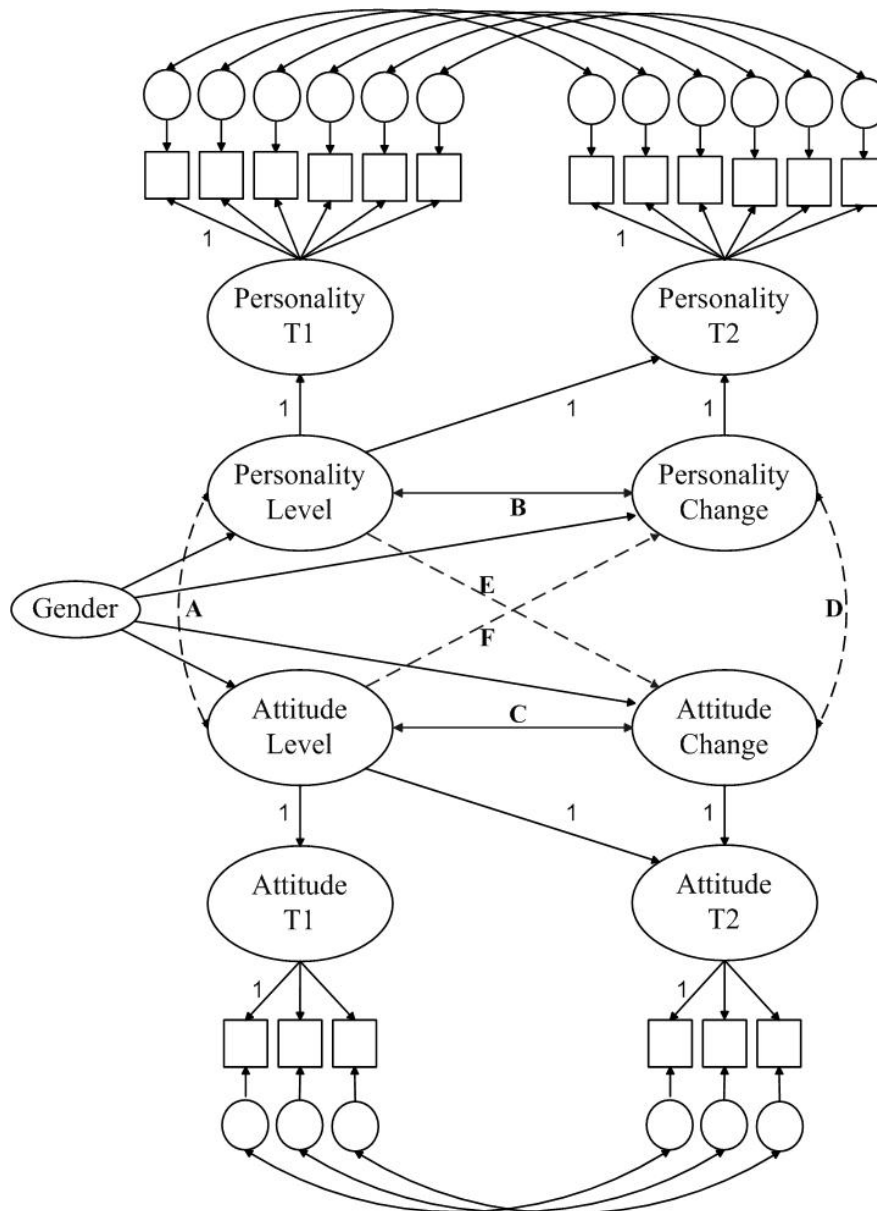


Figure 1. Representation of the multivariate structural equation model containing (a) the latent change models for personality traits (upper part) and work attitudes (lower part), and (b) the structural associations between both (dotted lines). Three item parcels (boxes) define the occasion-specific latent attitude variables (“Attitude T1” and “Attitude T2”). Fixed 1 regression coefficients define the Attitude Level and Attitude Change latent variables, which are allowed to co-vary. Factor loadings for the three attitude item parcels are constrained equal over time. Correlated residuals of the three scales across time are needed to obtain unbiased estimates of variance in Attitude change. For the Big Five personality traits, six facet scales instead of three item parcels were used to define the latent variables. Gender was included as a control variable in all multivariate models.

Chapter 5

Vocational interests and Big Five traits as predictors of job instability¹

Abstract

Although empirical research on this topic is scarce, personality traits and vocational interests have repeatedly been named as potential individual level predictors of job change. Using a long-term cohort study ($N = 291$), we examined RIASEC interest profiles and Big Five personality scores at the beginning of the professional career as predictors of subsequent job changes, both internal as well as external, over the next 15 years. Overall, results provide additional evidence for an individual difference perspective on job instability, although our findings vary across instability variables. Consistent with previous research, external job changes in particular related to individual differences. Specifically, scores on Investigative, Artistic, Enterprising and Conventional scales showed to be the most important interest related predictors. With regard to Big Five personality traits, strongest associations were found with Agreeableness and Openness. In addition, facet level analyses proved to be useful to further clarify linkages between personality and job instability.

¹ Wille, B., De Fruyt, F., & Feys, M. (2010). Vocational interests and Big Five traits as predictors of job instability. *Journal of Vocational Behavior*, 76, 547-558.

Introduction

Over the past decades, research on job change widened its focus and demonstrated some interesting evolutions. First, there was a growing interest in patterns of job mobility over a period of time, expanding the study of single turnover behaviors. Consequently, the conceptualization of job change now surpasses mere turnover behavior and is frequently labeled as job mobility, or patterns of intra- and inter-organizational transitions over the course of a person's work life (Hall, 1996; Sullivan, 1999). In addition to this broader conceptualization, there was also a shift in the way job change was valued. Specifically, the notion of job changes being intrinsically inefficient was abandoned. At the macroeconomic level, economists pointed out that job stability is not necessarily always a good thing as it can disable companies to restructure their workforce in times of structural change. Moreover, at the individual level, job change can be an opportunity to accumulate different work experiences and accordingly increase personal performance and market value. In fact, a solid body of research has shown that job shopping early in the career can be highly beneficial, resulting in greater wage gains than staying put with one employer (Bartel & Borjas, 1981).

Clearly, these evolutions in job stability research are the product of a number of factual changes in the labor market. Perhaps most perceptible are changes at the employer's side. As organizational lay-offs and restructuring are becoming more and more common now (Littler, Wiesner, & Dunford, 2003), it is not surprising that employers today no longer promote the idea of lifelong job security as a realistic employment goal. At the same time, longitudinal studies in American as well as European employees' samples have shown that organizational commitment is declining over time (Bentein, Vandenberg, Vandenberghe, & Stinglhamber, 2005; Vandenberg & Self, 1993) and career researchers have identified a transition from organizational to boundaryless or Protean careers. These labor market evolutions are further illustrated by evidence suggesting that job instability has markedly increased over the past decades (Bernhardt, Morris, Handcock, & Scott, 1999; White, Hill, Mills, & Smeaton, 2004).

As job insecurity is becoming a salient aspect in many employees' work experiences, research on this topic is necessary to help us understand how individual careers unfold. The aim of the present study is to gain further insight in possible individual level determinants of job instability. In previous research, job instability has been studied from very different viewpoints. In general, two main perspectives can be distinguished (Feldman & Ng, 2007). A *structural perspective* suggests structural factors in the labor market as the main determinants of employees' mobility. Accordingly, job mobility is considered to be mainly vacancy-driven (e.g., DiPrete, De Graaf, Luijkx, Tahlin, & Blossfeld, 1997). Although important, it is not likely that these structural factors account for all variation in job mobility. After all, even in times of severe economic recession, when job vacancies are limited, employees can still be motivated to pursue job mobility options. It is clear that individuals have different preferences toward job mobility, and the possible risks or uncertainties that come with it. In an *individual difference perspective*, it is theorized that one's career is, in part, governed by internal attributes like personality traits and vocational interests (Ng, Sorensen, Eby, & Feldman, 2007). Although this perspective seems intuitively logical and although explicit hypotheses have been formulated (e.g., Ng et al., 2007), empirical research on the relationships between these individual difference variables and job mobility is scarce and characterized by some important limitations. First, there has been much more research on intentions to move and attitudes toward moving than on actual change behavior (Ng, Eby, Sorensen, & Feldman, 2005). Second, very few studies have examined individual differences in actual job moves over a longer period of time. Third, although theoretically considered relevant, no studies have empirically investigated longitudinal relationships between vocational interests and the frequency of actual job changes. Therefore, the aim of this study is to further expand research on job instability considered from an individual difference perspective. Using a prospective longitudinal design, both vocational interests and personality traits measured at the beginning of the career are examined as potential predictors of job instability throughout the first 15 years of the professional career, further referred to as the first career stage.

Job Instability, Internal Mobility, and External Mobility

To date, multiple types and taxonomies of job mobility exist (e.g., Nicholson & West, 1998). In this study, the focus is on the frequency of career transitions -both intra- and inter-organizational- during the first 15 years of a person's work life. As such, *job instability* in this study refers to the aggregate of three different types of moving behaviors: (1) moving to a different job within the same organization, (2) moving to the same type of job with a different organization, and (3) moving to a different type of job with a different organization. In addition, we also differentiated between internal and external mobility behaviors. *Internal mobility* refers to any substantial change in work responsibilities, hierarchical level, or title within an organization. This includes internal promotions, transfers and demotions. *External mobility* refers to any change of employing firm.

Finally, our conceptualization of job instability does not differentiate between voluntary and involuntary moving behaviors. The focus in this study is on the validity of vocational interests and personality traits in the prediction of job instability during the first 15 years of the professional career. The individual difference perspective primarily suggests that dispositional attributes affect a person's preferences for and subsequent (voluntary) behaviors associated with job mobility. However, there is evidence that individual difference variables, like personality traits, can also affect vocational life indirectly or employer-driven rather than employee-driven (De Fruyt & Mervielde, 1999). In addition, it is often very hard to determine whether and to which extent job changes are entirely voluntary. For example, employees can anticipate employer dismissal decisions by means of job change. Furthermore, job changes are often the result of joint decision-making between employer and employee (e.g., internal job changes as part of career management programs) or between an employer and his/her partner (e.g., the decision to drop out of work to take care of the children). Probably, individual difference variables like personality traits and vocational interests affect these kinds of change decisions as well; processes which can't be tapped when only unambiguous and clear-cut voluntary job change decisions are considered.

Vocational Interests and Job Instability

Since its origin, Holland's RIASEC theory of vocational personalities has been widely applied to vocational life (Holland, 1997). In career research, the idea of 'congruence', which states that "*people find environments reinforcing and satisfying when environmental patterns resemble their personality patterns*" (Holland, 1985, p. 53) has received most attention. Numerous studies (e.g., Assouline & Meir, 1987) have found congruence to be positively associated with job satisfaction, stability, and success.

The aim of the present study is to investigate the validity of vocational interest profiles measured at the very beginning of the career for the prediction of job instability throughout the first career stage. Holland's (1985) descriptions of the six vocational personalities do not explicitly deal with the frequency of job changes. However, these descriptions do contain some cues on the desirability and likelihood of job instability for each of the six interest types (see also Feldman & Ng, 2007).

The *Enterprising type* prefers activities that entail the manipulation of others to attain organizational goals. This type values controlling others, the opportunity to be free of control, and being ambitious. (S)he would find holding a position of power most gratifying (Holland, 1997). This ambition and need to control others could motivate Enterprising types to engage in job changes throughout the first career stage.

The *Investigative type* prefers activities that entail the observational, symbolic, systematic, and creative investigation of physical, biological, and cultural phenomena. (S)he has a wide range of interests, is open to new ideas and experiences and dislikes repetitive activities (Holland, 1997). In addition, as they show substantial similarities with individuals high on Openness to Experience, it can be expected that individuals with Investigative interests are also more likely to welcome job opportunities. Their curious and experiential nature could motivate Investigative types to engage in job change behaviors throughout the first career stage.

The *Artistic type* prefers ambiguous, free, unsystematized activities that entail the manipulation of physical, verbal, or human materials to create art

forms or products. (S)he values personal characteristics such as being imaginative and courageous but not being obedient, logical, or responsible (Holland, 1997). Hence, their continuous pursuit of self-expression and perhaps impulsive nature could encourage them to engage in job change behaviors throughout the first career stage.

Hypothesis 1: Individuals with higher Enterprising, Investigative and Artistic career interests at the beginning of their professional careers will experience more job instability throughout the first career stage.

The *Conventional type* prefers activities that entail the explicit, ordered, systematic manipulation of data and has an aversion to ambiguous, free, exploratory, or unsystematized activities (Holland, 1997). People scoring high on Conventional interests prefer working on familiar tasks and in familiar surroundings. So, the obedient, dutiful and conservative nature of Conventional workers may discourage them to engage in job change behaviors throughout the first career stage.

Hypothesis 2: Individuals with higher Conventional career interests at the beginning of their professional careers will experience less job instability throughout the first career stage.

The *Social type* prefers activities that entail the manipulation of others to inform, train, develop, cure, or enlighten. These individuals further dislike explicit, ordered, systematic activities involving materials, tools, or machines. Contrary to the Social type, the *Realistic type* prefers activities involving the manipulation of things (objects, tools, machines and animals) and has an aversion to educational or therapeutic activities (Holland, 1997). For both vocational personality types, original descriptions of vocational preferences and adhered life goals and values do not provide explicit or implicit cues about the probability of job change behaviors. Therefore, no specific relations between

Realistic and Social interest scores on the one hand and frequency of job changes on the other are expected.

Hypothesis 3: Scores on Realistic and Social interest scales at the beginning of a professional career will be unrelated to job instability experienced throughout the first career stage.

Besides scores on the six interest scales, Holland's (1985) theory also provides secondary constructs (i.e. congruence, identity, coherence, consistency, differentiation, and commonness) to further interpret a vocational interest profile. In the present study, we focus on consistency and differentiation of interest profiles measured at the beginning of the career as predictors of subsequent job instability.

An interest profile is consistent in terms of RIASEC theory if the theoretical types most resembled are closely related or adjacent according to the hexagon (e.g., IA, SE). Although evidence is scarce and findings are mixed, high consistency is generally considered as positive and expected to be related to stability in work history (Holland, 1985; Reardon & Lenz, 1998). Therefore, in our study, we expect people with higher levels of interest profile consistency at the beginning of the career to experience less job instability throughout the first career stage.

The construct of differentiation is concerned with the range of scores in the whole interest profile and was originally created to capture what clinicians mean by a well-defined profile (Holland, 1985). A person who closely resembles one theoretical interest type and no other is highly differentiated, whereas a person who resembles all six RIASEC types to an equal degree is undifferentiated. Overall, the construct of differentiation has received less research attention compared to some of the theory's other assumptions. With regard to career stability, existing research mainly focused on student samples (e.g., Holland, 1968; Taylor, Kelso, Longthorp, & Pattison, 1980) and generally showed that high differentiation groups of students made more stable vocational choices than those of the low differentiation groups. Based on these preliminary findings, we also expect people with higher levels of interest profile

differentiation at the beginning of the career to experience less job instability throughout the first career stage.

Hypothesis 4: Higher levels of interest profile consistency and differentiation at the beginning of a professional career will be related to lower levels of job instability experienced throughout the first career stage.

Big Five Traits and Job Instability

Personality research has a long tradition in the study of vocational behavior. The idea that personality is meaningfully related to the kinds of careers people choose and how they perform in those careers is essential in most person-environment fit approaches to career choice and adjustment (e.g., Dawis & Lofquist's Theory of Work Adjustment, 1984). To date, the Five-Factor Model of personality (McCrae & Costa, 1987) can be considered as the most accepted personality taxonomy in the study of organizational behavior. Big Five personality measures have repeatedly been studied in relation to work and career related behaviors or outcomes (e.g., De Fruyt & Mervielde, 1999; Seibert & Kraimer, 2001). Previous studies that examined Big Five traits in relation to job change behavior mainly focused on turnover only at one point in time (Barrick & Mount, 1996). To our knowledge, Van Vianen, Feij, Krausz, and Taris (2003) were the first to study Big Five personality traits in relation to job changes over a longer period of time. Contrary to their hypotheses, they did not find any evidence for the validity of Big Five traits in the prediction of voluntary job changes. In the present study, the focus is on job instability during the first 15 years of the professional career, with no differentiation between voluntary and involuntary change behaviors. Based on the conceptual meaning of the Big Five traits, specific hypotheses concerning their relation to job instability can be formulated.

Agreeableness concerns the kinds of social interactions an individual prefers, from compassion to toughmindedness. People scoring low on this dimension typically value self-interest over getting along with others. Because of their egocentric and competitive nature, we expect people with lower levels

of Agreeableness at the beginning of the career to experience more job instability throughout the first career stage.

Hypothesis 5: Lower levels of Agreeableness at the beginning of a professional career will be related to higher levels of job instability experienced throughout the first career stage.

Extraversion can be summarized as the quantity and intensity of energy directed outwards into the social world. People scoring high on Extraversion like to seek new experiences and excitement (Watson & Clark, 1992). In addition, previous research (Vinson, Connelly, & Ones, 2007) found some Extraversion related traits (an activity scale and an outgoing scale) to be positively related to organization switching. Therefore, we expect people with higher levels of Extraversion at the beginning of the career to experience more job instability throughout the first career stage.

Openness to Experience refers to the active seeking and appreciation of experiences for personal benefit. As job changes allow one to seek more new experiences, we also expect people with higher levels of Openness at the beginning of the career to experience more job instability throughout the first career stage.

Hypothesis 6: Higher levels of Extraversion and Openness to Experience at the beginning of a professional career will be related to higher levels of job instability experienced throughout the first career stage.

Conscientiousness is the degree of organization, persistence, control and motivation in goal directed behavior. Within this trait, a distinction is often made between two major dimensions, achievement orientation and dependability, which complicate potential relationships with job instability. On the one hand, Conscientiousness comprises features as Competence (C1) and Achievement Striving (C4), which could lead to increased desire and opportunities for (upward) mobility. Crockett (1962) for example found that

people who reported a stronger achievement motive had greater upward mobility in their career. On the other hand, Conscientiousness also holds characteristics as Dutifulness (C3) and Deliberation (C6), which could be inhibiting factors for job changes. Because of these opposite facet level processes, which could neutralize each other at the domain level, we do not expect to find a significant relation between Conscientiousness at the beginning of the career and job instability throughout the first career stage.

Emotional Stability deals with people's susceptibility to psychological distress. As people low on Emotional Stability demonstrate nervousness and Anxiety (N1), they may not be seen as desirable candidates for (upward) mobility (Ng et al., 2005). Similarly, high levels of Self Consciousness or social anxiety (N4) could hinder people scoring low on Emotional Stability to consider or actively pursue job change opportunities. Conversely, high levels of Angry Hostility (N2) and/or Impulsiveness (N5) could increase the likelihood of job change. For example, Caspi, Elder, and Bem (1987) studied the lives of individuals over thirty years and found that ill-tempered adults, displaying hostility and moodiness, led more erratic work lives with a greater number of employers irrespective of their intelligence, socioeconomic status, and educational level. As for Conscientiousness, we expect opposite facet level processes to neutralize each other at the domain level, resulting in non significant relations between Emotional Stability at the beginning of the career and job instability throughout the first career stage.

Hypothesis 7: Domain level scores on Conscientiousness and Emotional Stability at the beginning of a professional career will be unrelated to job instability experienced throughout the first career stage.

In personality psychology, divergent ideas exist on the question whether it is best to use broadly defined personality traits or narrowly defined traits for the prediction of certain outcomes. This has come to be referred to as the 'bandwidth-fidelity dilemma'. With regard to the Big Five dimensions of personality, it has been argued that these are characterized by great bandwidth

(Briggs, 1989; Hogan, 1995) and some researchers (e.g., Ackerman, 1990; Hough, 1992; Tett, Jackson, Rothstein, & Reddon, 1994) have used the bandwidth-fidelity dilemma to argue against the use of broad personality variables. Their criticism is that too much information is lost when data are aggregated to the level of the Big Five, and they argue for a greater focus on more specific traits in organizational behavior. Likewise, Judge, Klinger, Simon and Yang (2008) note that specific traits like impulsivity and hostility have been extensively studied in psychology, except in organizational behavior research where they are virtually non-existent. Therefore, from an exploratory perspective, this study also examines facet level associations between Big Five traits and job instability during the first career stage.

Method

Design and Participants

The present study is part of an ongoing longitudinal research program on personality development and work related experiences in a Flemish alumni sample. In February-March 1994 (Time 1), three months before graduating, 934 college students from various faculties enrolled in this study, completing personality and interest inventories. One year later (1995, Time 2), a first follow-up was organized, focusing on their current educational or occupational situations at that time (see De Fruyt & Mervielde, 1999). In 2009 (Time 3), exactly 15 years after the first study, a second follow-up of the 1994-sample was conducted. As the sample was last contacted in 1995, the first step for this follow-up consisted of tracing all research participants. Letters were sent to all 934 home addresses as reported 15 years ago asking to pass on any data that could help us to reach the addressee. Four weeks later, a reminder was sent to those addresses that had not responded to the initial letter. In sum, 590 subjects (63.17%) responded to this mailing and provided us with a valid email address. For subjects that could not be reached with this mailing procedure, an alternative search was organized. Their names were entered in an online search engine (Google) and alternatively looked up via social and professional network sites (e.g., LinkedIn). Through this online search, 60 additional subjects were traced,

bringing the total number on 650 potential participants, 69.59% of the entire 1994 sample.

Each of these potential participants were subsequently sent an email containing further information on the research project and the request to participate. Subjects that were interested in the study could find three internet links at the bottom of the document, each link leading to a separate module of the entire survey. For the purpose of this study, only the second module, which deals with participants' professional careers over the past 15 years, is considered. In sum, 291 (156 males and 135 females) of the 650 participants (44.77%) completed this second module.

To test for attrition effects, we compared baseline interest and personality scores of those who participated in this follow-up to the scores of those who dropped out. With regard to T1 vocational interest scores, no mean differences were found between continuers and drop outs. Similarly, no selectivity effects were found for interest profile differentiation and consistency. With regard to Big Five personality traits, no differences were found between continuers and drop outs at the domain level. However, at the facet level, we found that continuers had higher average scores ($p < .01$) on Ideas (O5).

Measures

Personality. At Time 1, the Big Five personality traits and their facets were assessed using the Dutch authorized adaptation of the NEO-PI-R (Costa & McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996). The NEO-PI-R is a comprehensive personality questionnaire, measuring five global and 30 more specific traits. For the entire 1994 sample ($N = 934$), the NEO-PI-R yielded excellent Cronbach alpha coefficients on the domain level, that is, for Neuroticism $\alpha = .92$, Extraversion $\alpha = .90$, Openness $\alpha = .88$, Agreeableness $\alpha = .90$, and for Conscientiousness $\alpha = .92$. For the NEO-PI-R facets, reliabilities ranged from .61 (O6: Values) to .84 (N1: Anxiety, E3: Assertiveness, O1: Fantasy).

Vocational interests. Vocational interests at Time 1 were assessed using a Dutch authorized adaptation (BZO95; Hogerheijde, Van Amstel, De Fruyt, &

Mervielde, 1995) of the Self-Directed Search (SDS), originally developed by Holland (1979). Cronbach alpha coefficients for the composite RIASEC scales in the initial 1994 sample ($N = 934$) are .94 (Realistic), .90 (Investigative), .90 (Artistic), .90 (Social), .92 (Enterprising), and .90 (Conventional). In addition to RIASEC scale scores, we also computed differentiation and consistency of T1 interest profiles. For differentiation, the Iachan index (Holland, 1979) was used as this method is generally believed to be more a more comprehensive measure compared to the original method of subtracting the lowest interest score from the highest (Alvi, Khan, & Kirkwood, 1990). The degree of consistency in interest profiles was calculated using Strahan's (1987) C1 index, which uses the top three Holland codes.

Job instability. The second module of our 2009 online follow-up aimed at describing participants' professional careers over the past 15 years (from September 1994 until April 2009) in a standardized manner. For this purpose, they were asked to break this career stage down into successive time intervals according to job and/or organizational changes. Each space of time had to be specified with a starting and ending date and covered at least three months. In addition, these intervals had to be coded according to the following categories: (1) first job, (2) new job with a new employer or becoming self-employed, (3) same job with a new employer, (4) new job with the same employer (promotion, demotion, rotation), (5) career interruption (sickness, training, pregnancy, other), (6) same job as before career interruption and (7) job-seeking. *Job instability* is operationalized as the total frequency of changing behaviors, within and across employers (categories 2, 3, and 4). *Internal mobility* is operationalized as the frequency of job changes within the same employer (category 4); *external mobility* is the frequency of changing behaviors beyond the boundaries of a current employer (categories 2 and 3). Table 1 gives an overview of the descriptive statistics of all job instability variables.

Demographics. *Gender* was used as a control variable as previous research has shown that it can be related to career mobility (Van Vianen & Fischer, 2002). We did not control for years of employment and level of education because of the homogeneity of the sample with regard to these

variables: For each of the participants, the first 15 years of their careers is considered, and all participants were highly educated.

Results

Correlations

Table 2 displays the means, standard deviations, and intercorrelations among gender, the Big Five personality traits, RIASEC interest scales, secondary interest constructs, and job instability variables. Gender significantly correlated with three of the five personality traits, with women showing lower scores on Emotional Stability ($r = -.21, p < .01$), and higher scores on Openness to Experience ($r = .13, p < .05$) and Agreeableness ($r = .17, p < .01$). In addition, all six RIASEC interest scales showed significant correlations with gender, indicating higher scores for women on Artistic ($r = .24, p < .01$) and Social ($r = .25, p < .01$) interests, and higher scores for men on Realistic ($r = -.32, p < .01$), Investigative ($r = -.22, p < .01$), Enterprising ($r = -.14, p < .05$), and Conventional ($r = -.14, p < .05$) interests. Finally, gender significantly correlated with job instability, indicating less instability for women than for men ($r = -.13, p < .05$).

Vocational Interests and Job Instability

To further examine the associations between the vocational interests and job instability, Poisson regression analyses were performed for job instability, internal mobility and external mobility separately (see Table 3). This type of regression analysis is a special case of the Generalized Linear Model which uses a log transformation to adjust for the skewness of the data distribution. Poisson regression is especially relevant for the analysis of count data, which reflect the number of occurrences of a behavior in a fixed period of time (e.g., number of job or organizational changes). Each time, gender was entered in the first step as a control variable, followed by the RIASEC interest scales in the second step, and the secondary interest constructs in the final step.

Results show that gender was significantly associated with job instability ($\chi^2 = 6.416, p < .05$) and external mobility ($\chi^2 = 4.127, p < .05$), with women

showing fewer job changes than men. For internal mobility, adding gender as a control variable did not significantly increase model fit ($\chi^2 = 2.308, p > .05$).

In the second step, RIASEC vocational interest scales were entered in our prediction model. Results show that this increased model fit for overall job instability ($\Delta\chi^2 = 24.467, p < .01$) as well as for internal mobility ($\Delta\chi^2 = 14.447, p < .05$) as for external mobility ($\Delta\chi^2 = 36.137, p < .01$). With regard to overall job instability, results partially confirmed our first hypothesis as we only found a significant positive association with Enterprising interest scores. In addition, the negative relation between job instability and Conventional interest scores confirmed our second hypothesis. Finally, in accordance with our third hypothesis, no significant associations were found between job instability and Realistic or Social interest scores.

When only internal job mobility was considered, only two significant associations were found. First, our results show a positive association between Realistic interest scores and internal mobility. In addition, higher scores on the Enterprising interest scale were also related to more frequent internal job changes.

Most significant associations were found between interest scales and external mobility. Specifically, we found a positive association with Investigative, Artistic and Enterprising interests. In addition, higher scores on the Conventional interest scale were related to less frequent external job changes.

In the final step of our Poisson regression analyses, we entered interest profile differentiation and consistency as potential predictors of job instability, internal mobility and external mobility respectively. Contrary to our expectations (Hypothesis 4), we did not find any significant associations between the frequency of job changes and these secondary interest constructs.

Big Five Domains and Job Instability

A second series of Poisson regression analyses were performed to further examine the associations between the Big Five personality traits and job instability, internal mobility, and external mobility. Again, gender was each time

entered in the first step as a control variable, followed by the Big Five domain scores in the second step (see Table 4).

The results show that adding the Big Five traits to our prediction model resulted in a significant gain in the prediction of job instability ($\Delta\chi^2 = 11.54, p < .05$). As expected, a significant negative association was found with Agreeableness (Hypothesis 5) and no significant domain level associations were found with Emotional Stability and Conscientiousness (Hypothesis 7). Finally, contrary to our expectations, we did not find a significant association between job instability and Extraversion, or between job instability and Openness to Experience (Hypothesis 6).

When differentiating between external and internal mobility, significant increase in model fit was only found for external job changes ($\Delta\chi^2 = 15.859, p < .01$). Specifically, external mobility was positively related with Openness to Experience and negatively with Agreeableness. For internal mobility, the addition of Big Five traits did not result in a significantly better model fit ($\Delta\chi^2 = 8.892, p > .05$).

Big Five Facets and Job Instability

Associations between NEO-PI-R facets and job instability were examined using partial correlations controlling for gender (see Table 5). At the domain level, Agreeableness showed to be the most important personality predictor for overall job instability. Facet level associations depict that Modesty (A5) is the only Agreeableness related trait that is significantly correlated with job instability ($r = -.13, p < .05$). Stronger facet level associations were found with Excitement Seeking (E5; $r = .16, p < .05$) and Impulsiveness (N5; $r = .18, p < .01$). Finally, job instability was also significantly related to Angry Hostility (N2; $r = .14, p < .05$), Openness to Actions (O4; $r = .14, p < .05$), Openness to Ideas (O5; $r = .14, p < .05$), and Deliberation (C6; $r = -.14, p < .05$).

With regard to internal mobility, domain level personality traits did not significantly improve the fit of our prediction model. Likewise, we only found modest evidence for predictive validity at the facet level as only two personality

facets are significantly correlated with internal mobility: Excitement Seeking (E5; $r = .20, p < .01$) and Warmth (E1; $r = .14, p < .05$).

External mobility was significantly predicted by Agreeableness (negative association) and Openness to Experience (positive association). At the facet level also, most significant correlations were found with Agreeableness related traits: Altruism (A3; $r = - .19, p < .01$), Modesty (A5; $r = - .18, p < .01$), Compliance (A4; $r = - .15, p < .05$) and Tendermindedness (A6; $r = - .13, p < .05$). The association between Openness to Experience and external mobility is reflected in the positive correlation with Ideas (O5; $r = .15, p < .05$). Finally, the strongest facet level associations with external mobility were found for Angry Hostility (N2; $r = .20, p < .01$) and Dutifulness (C3; $r = - .20, p < .01$).

Discussion

Vocational Interests and Job Instability

Many researchers have theorized that individuals' specific career interests also affect job mobility and/or embeddedness (e.g., Lent, Brown, & Gail, 1994; Oleski & Subich, 1996). To our knowledge, this study was the first to empirically test longitudinal associations between vocational interests and job instability, using Holland's (1985) typology as this model is most commonly adopted and validated in the careers literature (Prediger, 2000).

First, we used a series of Poisson regression analyses to examine the effect of all RIASEC interest scales together while controlling for gender. Consistent with our expectations, we found a significant positive association between Enterprising interests and job instability. In addition, this positive association remained significant when only internal or external job changes were considered. Professional ambition and a need to control others could be one of the driving mechanisms behind these associations. Similarly, Chan, Rounds and Drasgow (2000) found a positive relation between Enterprising interests and the motivation to lead. However, our results do not offer a definite test of this explanation as we did not distinguish between upward, downward or lateral job changes.

As *Conventional types* prefer working on familiar tasks and in familiar surroundings, we hypothesized that Conventional career interests should be negatively related to job instability. Indeed, we found that individuals scoring higher on the Conventional interest scale reported less overall and external moving behaviors. As Douce and Hansen (1990) note, Conventional career interests reflect a preference for routine and predictability in jobs which could explain lower levels of job instability, especially external job changes. Because of the curious and experiential nature of *Investigative* and *Artistic types*, we expected a positive relation between these vocational interest scales and job instability. However, this was only confirmed when only external job changes were considered. Finally, as expected, we did not find any significant relations between overall job instability on the one hand and *Realistic* and *Social interests* on the other. However, although there are no clear reasons to believe that Realistic individuals will exhibit certain types of job mobility (Ng et al., 2007), our results did indicate a significant positive relationship between Realistic interest scores and internal mobility.

In addition to RIASEC interest scales, we also tested the validity of Holland's (1985) secondary interest constructs of differentiation and consistency in the prediction of job instability. Although they are often considered valuable from a practical point of view, these concepts have produced mixed evidence in past research on career stability (Holland, 1997). Consistent with Holland's (1985) original assumptions, we expected lower levels of differentiation and lower levels of consistency at the beginning of the professional career to be related to higher levels of career instability during the subsequent 15 years of employment. However, the results show that adding differentiation and consistency to our prediction model did not significantly improve model fit for job instability, internal mobility and external mobility. These findings could be explained by the conceptualization of career instability that was used. In this study, job instability was operationalized as the frequency of job changes over the past 15 years, irrespective of any intrinsic aspects of job changes. Previous studies that looked at consistency and differentiation of vocational interests as predictors of career instability primarily focused on the nature of job change

rather than on its frequency. In that perspective, frequent changes within the same domain also indicate stability, whereas a single shift toward a totally different domain can be interpreted as instability.

Big Five Personality Traits and Job Instability

Past research on personality and job change mainly focused on the prediction of turnover intentions or single turnover behaviors. Present study attempted to expand this line of research in two ways. First, job change is considered over a period of time, resulting in a measure of job instability during the first 15 years of the professional career. Second, a longitudinal design was used in which personality measured at the beginning of the career was used as a predictor of subsequent job change behaviors. This prospective design is particularly interesting given the growing evidence that personality, throughout adulthood, can develop under the influence of work related experiences (e.g., Roberts, Caspi, & Moffitt, 2003).

Consistent with our hypothesis, we found a significant negative relation between Agreeableness and overall job instability. In addition, people scoring low on Agreeableness also changed employers more frequently. This negative association between Agreeableness and external mobility can be interpreted in several ways. From an employee's perspective, voluntarily changing organizations can be considered as a difficult decision. Employees leaving their organization may be perceived as rejecting their teammates and letting down their employer. It could be that individuals scoring high on Agreeableness are more sensitive for these uncomfortable consequences and value social peace and good relations over personal ambition, resulting in less mobility behaviors. Individuals scoring low on Agreeableness, on the other hand, care much less about interpersonal feelings or relationships and experience less difficulties with the loss effects that accompany organization switching. From an employer's perspective, it could be argued that employees high on Agreeableness are very much valued because of their positive contributions on team performance (e.g., Peeters, Van Tuijl, Rutte, & Reymen, 2006), and therefore are tied to the organization. Individuals low on Agreeableness, on the other hand, can be

difficult to handle within groups or organizations and are therefore less retained by employers.

Contrary to our expectations, Extraversion and Openness to Experience were not significantly associated with job instability. However, at least for Openness, we did find a significant relation when only external job changes were considered. This association is evident knowing that individuals high on Openness are characterized by being imaginative, being independent-minded, having wide interests, being non-conformist, being innovative, being complex, and being change oriented (John & Srivastava, 1999). In addition, Vinson et al. (2007) also found higher scores on Openness related traits to be correlated with more frequent organization switching. Finally, consistent with our expectations, we did not find any significant domain level associations between any of our job instability variables on the one hand and Emotional Stability and Conscientiousness on the other.

In addition to the Big Five personality domains, we also explored the relations between the frequency of job changes and the NEO-PI-R facets, controlling for gender. This enabled us to examine the idea that some Big Five traits (e.g., Emotional Stability, Conscientiousness and Extraversion) are perhaps too broad to be related to job change behaviors.

For Emotional Stability, we expected Anxiety and Self Consciousness to cancel out the instability promoting effects of Angry Hostility and Impulsiveness. Although we did not explicitly test this buffering hypothesis, results do show some indications in this direction. Clearly, Angry Hostility and Impulsiveness are positively related to job instability, whereas for Anxiety and Self Consciousness the trend is towards a negative association. Similarly, for Conscientiousness, we expected opposite facet level effects of Competence and Achievement Striving on the one hand, and Dutifulness and Deliberation on the other. Results clearly support the negative effects of Dutifulness and Deliberation, especially with regard to external mobility. For Competence and Achievement Striving, near zero correlations were obtained.

Contrary to our expectations, we did not find a significant domain level association between job instability and Extraversion. Nevertheless, facet level

analyses did indicate some aspects of Extraversion to be significantly related to job instability. Consistent with our domain level expectations, we found a positive association between Sensation Seeking and overall job instability. However, the need for environmental stimulation was only related with the frequency of internal job changes. Similarly, we found a significant positive association between Warmth and internal mobility. Warm people genuinely like people and easily form close attachments to others, which indeed could be a prerequisite for internal job changes. Finally, no Extraversion related traits were related to employer switching.

Besides explaining insignificant domain level relations, a facet level approach can also offer a more detailed understanding of established domain level effects. For example, with regard to Agreeableness, facet level analyses show negative associations with Altruism (i.e. active concern with the welfare of others), Compliance (i.e. response to interpersonal conflict), Modesty (i.e. tendency to play down on own achievements), and Tendermindedness (i.e. attitudes of sympathy for others). In this light, from a personality point of view, to some degree switching employers has an egocentric basis. This idea is further sustained by the significant negative relation between external mobility and Dutifulness (i.e. emphasis placed on importance of fulfilling moral obligations).

The present study is not free of limitations. First, our dependent variables (job mobility, internal mobility, and external mobility) do not distinguish between voluntary or involuntary mobility behaviors. The psychological processes underlying these two types of job instability can be very different, meaning that our results could differ if voluntary and involuntary mobility were studied separately. However, the purpose of this study was to examine the broader picture of stability and change during the first 15 years of a professional career from an individual difference perspective. Often, it is far from clear whether or not job changes are voluntary or not as in many cases they are the result of a joint-decision making process. In addition, this distinction is further complicated by the fact that people can proactively anticipate employer decisions. Nevertheless, the results of our study demonstrate that individual difference variables, like vocational interests and personality traits measured at

the beginning of the professional career, can to some extent predict subsequent job instability over the next 15 years.

Second, we did not examine the direction of changing behaviors (upward, downward or lateral). Some researchers (e.g., Feldman & Ng, 2007) formulate specific hypotheses about personality traits, vocational interests, and direction of job change. However, we feel that -in present labor market characterized by less clear-cut jobs, more diffuse responsibilities, and hierarchical organizational structures fading away- the direction of job change in terms of ‘upward, downward or lateral’ is often obscure and in many cases actually irrelevant.

Conclusions

Using a prospective longitudinal design, this study examined the predictive validity of personality and vocational interests, measured at the very beginning of the professional career, for subsequent job mobility behaviors over the next 15 years. Overall, we found additional empirical evidence for an individual difference perspective on job mobility.

To our knowledge, this study was the first to empirically test the longitudinal predictive validity of vocational interests for job mobility behaviors over a long period of time. Indeed, our results show that RIASEC interest scores, measured at the beginning of the career, are to some extent related to subsequent job instability. Conversely, interest profile differentiation and consistency did not significantly predict the frequency of job changes over the next 15 years.

With regard to the Big Five personality traits, our results are consistent with previous research showing only modest evidence for validity in the prediction of mobility behaviors. Interestingly, we found the strongest association between job instability and Agreeableness, which is often the “forgotten trait” in the study of organizational behavior. In addition, the possibility to look at facet level relationships between personality and job change variables proved to be useful to ameliorate our understanding of certain domain level relations. Further, this facet level approach also illustrates how

some Big Five traits (e.g., Emotional Stability and Conscientiousness) are perhaps too broad to study individual differences in job instability.

Consistent with previous research, we also differentiated between internal and external moving behaviors. Overall, our research findings suggest that the individual difference perspective is less useful for the study of internal job mobility. Indeed it makes sense that other factors, like organizational characteristics, are more important in the prediction of internal job rotations than personality or vocational interests.

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Tables

Table 1

Descriptive statistics of the job instability variables

Variables	<i>M</i>	<i>SD</i>	Min	Max
New job with a new employer / self-employed	1.56	1.47	0	7
Same job with a new employer	0.34	0.80	0	7
Internal mobility ^a	1.34	1.53	0	8
External mobility ^b	1.90	1.68	0	7
Job instability ^c	3.25	1.99	0	9

Note. ^a Internal mobility refers to moving to a different job within the same company. ^b External mobility refers to any change in employer operationalized as the aggregate of the first two categories. ^c Job instability refers to any type of job change, operationalized as the aggregate of internal and external mobility.

Table 2

Means, standard deviations and correlations

	M	SD	1	2	3	4	5	6	7	8
1. Gender ^a	-	-	-							
2. Emotional Stability	136.20	20.77	-.21**	1						
3. Extraversion	136.20	20.05	-.01	.35**	1					
4. Openness	170.94	16.71	.13*	-.11	.19**	1				
5. Agreeableness	164.78	19.18	.17**	.13*	.08	.11	1			
6. Conscientiousness	167.24	17.62	.04	.36**	.16**	-.09	.12*	1		
7. Realistic	35.49	12.75	-.32**	.10	.06	-.06	-.06	.07	1	
8. Investigative	42.13	12.02	-.22**	.10	-.04	.08	.00	.10	.42**	1
9. Artistic	35.77	12.83	.24**	-.19**	.14*	.59**	.01	-.16**	.08	.05
10. Social	45.11	12.22	.25**	-.01	.41**	.28**	.33**	.08	-.04	.10
11. Enterprising	41.95	14.62	-.14*	.29**	.51**	.01	-.21**	.32**	.21**	.18**
12. Conventional	36.04	12.86	-.14*	.16*	.06	-.17**	.05	.46**	.33**	.27**
13. Differentiation	6.44	3.17	.04	-.01	-.09	-.15*	-.05	-.03	-.24**	-.11
14. Consistency	6.44	2.91	-.01	.00	-.02	.05	.02	-.05	-.15**	-.30**
15. Job instability	3.25	1.99	-.13*	.00	.12	.15*	-.13*	-.06	.10	.09
16. Internal mobility	1.34	1.53	-.07	.07	.17**	.01	.02	-.02	.08	-.03
17. External mobility	2.90	1.68	-.10	-.07	-.01	.17**	-.16**	-.06	.04	.14*

Table 2 (Continued)

	9	10	11	12	13	14	15	16	17
9. Artistic	1								
10. Social	.44**	1							
11. Enterprising	.17**	.35**	1						
12. Conventional	-.06	.14*	.52**	1					
13. Differentiation	-.19**	.04	-.15**	-.23**	1				
14. Consistency	.02	.06	-.00	-.07	.15*	1			
15. Job instability	.07	.01	.15**	-.07	-.01	-.04	1		
16. Internal mobility	-.04	.04	.11	.03	.00	.01	.57**	1	
17. External mobility	.12*	-.02	.08	-.12*	-.01	-.05	.66**	-.24**	1

Note. **p < .01, *p < .05; ^a 1 = male, 2 = female.

Table 3

Poisson regression analyses with interests as predictors of job instability, internal mobility and external mobility

	Job instability			Internal mobility			External mobility		
	χ^2	$\Delta\chi^2$	<i>b</i>	χ^2	$\Delta\chi^2$	<i>b</i>	χ^2	$\Delta\chi^2$	<i>b</i>
Step 1: <i>Control variable</i>	6.416*	--		2.308	--		4.127*	--	
Gender			-.130			-.09			-.15
Step 2 : <i>RIASEC interests</i>	30.883**	24.467**		16.755*	14.447*		40.264**	36.137**	
Realistic			.003			.01*			-.002
Investigative			.003			-.01			.012**
Artistic			.002			-.01			.010**
Social			-.002			.01			-.008
Enterprising			.011**			.01*			.012**
Conventional			-.012**			-.01			-.017**
Step 3 : <i>Secondary constructs</i>	31.083	0.200		16.875	0.120		40.338	0.074	
Differentiation			.003			.00			.003
Consistency			-.005			-.01			-.003

Note. B-coefficients concern the full model in which all independent variables were entered simultaneously. ** $p < .01$, * $p < .05$

Table 4

Poisson regression analyses with Big Five traits as predictors of job instability, internal mobility and external mobility

		Job instability			Internal mobility			External mobility		
		χ^2	$\Delta\chi^2$	<i>b</i>	χ^2	$\Delta\chi^2$	<i>b</i>	χ^2	$\Delta\chi^2$	<i>b</i>
Step 1:	<i>Control variable</i>	6.416*	--		2.308	--		4.127*	--	
	Gender			-.144			-.166			-.125
Step 2 :	<i>Big Five traits</i>	17.956**	11.54*		11.820	8.892		19.986**	15.859**	
	Emotional Stability			-.002			-.002			-.002
	Extraversion			.004			.009**			.000
	Openness			.004			.001			.006*
	Agreeableness			-.004*			.002			-.007**
	Conscientiousness			-.002			-.001			-.003

Note. B-coefficients concern the full model in which all independent variables were entered simultaneously. ** $p < .01$, * $p < .05$

Table 5
Partial correlations controlling for gender

NEO-PI-R Facet	Job instability	Internal mobility	External mobility
N1: Anxiety	-.02	-.06	.04
N2: Angry Hostility	.14*	-.04	.20**
N3: Depression	.08	.03	.07
N4: Self Consciousness	-.07	-.03	-.05
N5: Impulsiveness	.18**	.10	.12
N6: Vulnerability to Stress	.03	-.07	.10
E1: Warmth	.03	.14*	-.10
E2: Gregariousness	.04	.08	-.04
E3: Assertiveness	.13	.07	.09
E4: Activity	.09	.09	.01
E5: Excitement Seeking	.16*	.20**	-.01
E6: Positive Emotion	-.01	.07	-.08
O1: Fantasy	.10	.01	.10
O2: Aesthetics	.03	.01	.03
O3: Feelings	.10	.06	.06
O4: Actions	.14*	.08	.09
O5: Ideas	.14*	.02	.15*
O6: Values	.03	.01	.03
A1: Trust	-.04	.02	-.07
A2: Straightforwardness	-.10	-.01	-.11
A3: Altruism	-.07	.11	-.19**
A4: Compliance	-.11	.03	-.15*
A5: Modesty	-.13*	.02	-.18**
A6: Tendermindedness	-.12	-.01	-.13*
C1: Competence	.02	-.03	.05
C2: Order	-.08	.02	-.11
C3: Dutifulness	-.07	.12	-.20**
C4: Achievement Striving	.02	-.03	.05
C5: Self Discipline	-.11	-.04	-.09
C6: Deliberation	-.14*	-.03	-.14*

Note. ** $p < .01$, * $p < .05$, two-tailed.

Chapter 6

A transactional approach to person-environment fit: Reciprocal relations between personality development and career role growth across young to middle adulthood¹

Abstract

In order to enhance our understanding of person-environment transactions, the present longitudinal cohort study examined the dynamic interactions between career role development and personality development over a time interval of 15 years. A sample of college alumni ($N = 260$) provided self-reports on Big Five traits three months prior to graduation and 15 years later when their career had unfolded. In addition, detailed descriptions of their career role trajectories over this time interval were obtained. Results first indicated significant positive associations between personality trait levels and initial career role engagement: Extraversion predicted Presenter, Director, Inspirator and Guide roles; Conscientiousness predicted Expert role; Agreeableness predicted Guide role; and Openness to experience predicted Presenter role. Further, initial trait levels were found to predict subsequent changes in career role engagement, and the strength of these associations varied according to career stage (first versus second half of the time interval). Finally, change in career roles over time was associated with change in at least one personality trait, except Openness to experience. The study provides insights into the largely unstudied question of how career identities grow and how this relates to personality development during young adulthood.

¹ Wille, B., Beyers, W., & De Fruyt, F. (in press). 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*.

Introduction

The construct of person-environment (PE) fit is considered a cornerstone in the field of vocational psychology (Savickas, 2000), and is rooted in trait and factor theory. Accordingly, choosing an occupation involves trying to match an individual to a job so that their needs will be met and their job performance will be satisfactory (Sharf, 1992). Whereas the application of PE fit in trait and factor theory relied heavily on the measurement of individual traits and (static) matching processes with environmental requirements, more contemporary perspectives on PE fit have introduced the concept of *dynamic reciprocity* (Rounds & Tracey, 1990). This indicates an ongoing concept of adjustment as environments are influenced by individuals and individuals are influenced by environments. “*The P × E fit perspective explicitly assumes that people and environments change continually in ongoing adjustment*” (Chartrand, 1991, p. 521). This significant concept addresses some of the important criticisms that have been leveled at trait and factor theory (Patton & McMahon, 1999). Most importantly, the advantage of this dynamic perspective on PE fit over static trait and factor theory is that it offers a way for understanding the *career development process*.

Looking at PE fit research, however, very little effort has been done over the past decades in order to gain insight into dynamic reciprocity. Instead, studies addressing PE fit typically adopt a static approach in which fit or congruence is related to career outcomes assessed at the same or a later point in time (Ishitani, 2010). Although there are some studies that have adopted a more dynamic approach by incorporating *change* (e.g., Donohue, 2006; Oleski & Subich, 1996), these are severely restricted in that they only consider environmental change (i.e. job mobility) as a way to enhance fit.

The present study aims to contribute to research on PE fit by focusing on the reciprocal relations between P and E characteristics. Drawing on current perspectives from personality psychology regarding trait development and using a recently developed career roles model to conceptualize career development, the present study presents a comprehensive test of *person-environment*

transactions in a longitudinal sample of working adults spanning the first 15 years of the professional career.

Neo-Socioanalytic Perspectives on Trait Development

Five-Factor Model (FFM) personality traits (McCrae & Costa, 1987) are used in the present study to conceptualize the P component of PE transactions. These traits have been successfully related to different aspects of vocational behavior, including work environment preferences (Larson, Rottinghaus, & Borgen, 2002), nature of employment (e.g., De Fruyt & Mervielde, 1999), and career path characteristics (e.g., Wille, De Fruyt, & Feys, 2010). Further, from a developmental perspective, compelling evidence has accumulated over the past decade indicating that change in personality traits is possible at all ages across the life course, with the preponderance of change occurring in young adulthood (Roberts, Robins, Caspi, & Trzesniewski, 2003). Normative developmental changes, such as the tendency of people to become more agreeable, conscientious, emotionally stable and socially dominant have been observed across birth cohorts, national cultures, and using both longitudinal and cross-sectional research designs (Roberts, Walton, & Viechtbauer, 2006).

Interestingly, research has also indicated meaningful interindividual differences in personality development (Roberts, Caspi, & Moffitt, 2003), indicating that not all people follow these normative tendencies to the same extent, or even in the same direction. This has led to the hypothesis that life experiences, including those at work, play a significant role in personality trait change. Within the neo-socioanalytic model of personality (Roberts & Wood, 2006), personality traits and occupational experiences are in constant transaction across the life span. The present study corroborates this reciprocal hypothesis by exploring (a) the role that personality plays in shaping individuals' careers and (b) the impact of individuals' careers on personality development.

Career Roles as Units of Analysis

While former theoretical approaches of careers (e.g., Super's well-established career model; 1980) assumed largely fixed and normative career stages, more recent work describes a career as a dynamic and interactive process

of continuous learning (Hall & Mirvis, 1995). Hence, the notion of development has become more central in career theory, and this is elaborated in developmental contextual approaches such as the life-span developmental contextual theory of career development formulated by Vondracek and colleagues (Vondracek & Kawasaki, 1995; Vondracek, Lerner, & Schulenberg, 1986). Central in this theory is the notion of dynamic interaction, in relation to both development in general and vocational development in particular, that captures the way in which contexts and persons interact, influence, and transform one another.

From this new tradition, Hoekstra (2011) introduced the Career Roles Model (CRM) as an interesting new theoretical framework to understand career development in terms of emerging career role identity. Accordingly, the essential issue for understanding the nature and development of individual careers concerns the underlying roles. Broadly defined, roles and role labels serve a communicative purpose to capture a complex mixture of tasks, goals, values, norms, and expectations concerning a position in some social context (Ashforth, 2001). In the case of work roles, this context is work and Hoekstra (2011) uses the concept *career roles* to describe “*those enduring aspects of work roles that the person identifies with and is identified with*” (p. 5). According to the CRM, career roles are thus to be considered as the building blocks of individual careers, and a taxonomy is provided that distinguishes between six roles (Maker, Expert, Presenter, Guide, Director, and Inspirator) that are valid and potentially attainable in most jobs with some employee autonomy (Hoekstra, 2011).

Career Role Development

Beyond the identification of career roles as the building blocks of individual careers, the CRM also outlines a detailed perspective on career development. Accordingly, career development is the gradual and interactive acquisition of a repertoire of career roles over time. It is a gradual process, as career development spans the entire work life; it is interactive, as career development is the result of two simultaneous forces. On the one hand, individuals select certain

roles based on their personal preferences and competencies (i.e., role taking); on the other, people are driven toward certain roles as a result of environmental demands and expectations (i.e., role pressure). Over the years, roles and commitments are selectively strengthened, while at the same time people keep adapting to external pressures and changes by innovating and negotiating their roles. Career development is, thus, to be understood as processes of *identity construction* in the work life (Hoekstra, 2011). The result of this process is an emerging career identity, which is to be considered as a continually updated internalization of career roles and associated commitments and aspirations.

Based on these general outlines, we believe there are two important reasons why the CRM is particularly appealing to study PE transactions. First, the model explicitly acknowledges the role the individual plays in shaping his or her career. This is true for the content of career development as well as for shape. Specifically, the individual is expected to pursue a career that fits his or her personal constellation. Furthermore, while some individuals prefer their role repertory to remain stable and unchanged during long periods of time, others are more engaged in exploring new roads and allow their career identity to continually grow and change. A second reason to argue for the CRM in the context of PE transactions refers to its underlying processes. The CRM explicitly refers to the process of identity development to describe career development. This is appealing, as it has been argued that role identities may offer a way to understand how life experiences, including those at work, and general personality traits interact over time (Wood & Roberts, 2006).

P-E Transactions: Attraction-Selection-Transformation-Manipulation-Attrition

Drawing on Schneider's Attraction-Selection-Attrition framework (ASA; Schneider, 1987), Roberts (2006) introduced an elaborated Attraction-Selection-Transformation-Manipulation-Attrition (ASTMA) model that allows for a thorough understanding of person-environment transactions in the work context. The processes described by the ASTMA model form the basis of the hypotheses examined in the present study.

Attraction and selection. The first two mechanisms described by the ASTMA model deal with the employment process itself. On the one hand, *Attraction* refers to the process by which people are attracted to work environments that fit with their personality. *Selection* refers to the fact that people are also selected into and oriented towards specific work environments that are supposed to be compatible with their personal characteristics.

Role engagement, according to the CRM, is supposed to result from two simultaneous forces, i.e. role taking and role pressure, that closely align with both mechanisms described above. Role taking describes the process through which individual employees are attracted to specific career roles, and Hoekstra (2011) hereby draws on socioanalytic personality theory (Hogan & Roberts, 2000) to classify the principal motives that drive people to certain work environments. The second process, role pressure, is generally described as a counterforce that represents the demands and expectations from the environment (Hoekstra, 2011). Employees are selectively mobilized to ensure organizational stability, which entails selecting and orienting employees' with the primary purpose of continued membership. Employers have well-defined expectations about an individual's role in the organization and about the competencies that are required to succeed. Evidence for the role that personal characteristics play in these processes of role taking (attraction) and role pressure (selection) comes from research demonstrating the validity of personal dispositions (e.g., personality traits and vocational interests) to predict status and nature of employment (De Fruyt & Mervielde, 1999).

Although no prior research has examined the associations between personality traits and actual career role engagement, a number of expectations can be formulated based on the content of each of the six roles. In the present study, these mechanisms of attraction and selection are examined by associating participants' Big Five personality traits, measured at the very beginning of the professional career, to their initial levels of role engagement early in the career.

Engagement in both the roles of Maker and Expert is assumed to be driven by goals regarding personal mastery and success, and a strong emphasis in these roles is put on independent individual production (Hoekstra, 2011). In

terms of personality characteristics, these role descriptions most closely align with the Conscientiousness domain, which has also been labeled as the ‘Will to achieve’ (Digman & Inouye, 1986). Therefore, Conscientiousness scores at the beginning of the career are expected to be positively associated with early career engagement in the Maker and Expert roles (*Hypothesis 1a*).

The Presenter and Guide roles both emphasize the social interactions with others (Hoekstra, 2011). As Agreeableness and Extraversion are considered to be particularly relevant in the context of interpersonal behavior (Wiggins & Broughton, 1985), these traits can be expected to relate to engagement in these roles. In the Presenter role, social interactions are typically used with the primary purpose of convincing and influencing others. Clearly, these interactions require an energetic and dominant position, and therefore it is expected that Extraversion scores at the beginning of the career are positively related to early career engagement in the Presenter role (*Hypothesis 1b*). On the other hand, the Guide role focuses on connecting with and committing to others, interactions which require stronger empathic competencies. Therefore, Agreeableness scores at the beginning of the career are expected to be positively associated with early career engagement in the Guide role (*Hypothesis 1c*).

Finally, the roles of Director and Inspirator share their focus on the collective development of groups and organizations (Hoekstra, 2011). Whether it is with the purpose of realizing long term goals (Director role) or to initiate strategic change (Inspirator role), it can be assumed that both roles have a high decision latitude in common. As research has demonstrated that the degree of decision making opportunities at work correlates positively with Extraversion (e.g., Grant & Langan-Fox, 2006), it is expected that Extraversion scores at the beginning of the career are positively associated with early career engagement in Director and Inspirator roles (*Hypothesis 1d*).

Attrition and manipulation. The ASTMA model further describes two ways by which individuals can actively shape their work environment. First, it is argued that people can decide to leave their work environment, a mechanism referred to as *Attrition* (Schneider, Smith, Taylor, & Fleenor, 1998). In addition, *Manipulation* refers to the idea that individuals consciously as well as

unconsciously may attempt to modify their organizational experiences in order to maximize fit (Roberts, 2006). This is in line with the idea of job crafting which suggests that individuals can affect their day-to-day work experience by altering the tasks they do, organizing their work differently, or by changing the nature of the relationships they maintain with others (Wrzesniewski & Dutton, 2001).

According to the CRM, career development is day-to-day micro development, expressed in the gradual strengthening, weakening, and change of certain roles (Hoekstra, 2011). In the present study, individuals' attempts to shape their work environment are studied by examining the degree of stability and change in career role engagement, over and within jobs, across the first fifteen years of the professional career. Based on prior research documenting the long-term stability of work environments (e.g., Sutin & Costa, 2010) we first expect to find moderate levels of rank order stability in role engagement across the entire time interval (*Hypothesis 2*).

In addition, more specific expectations can be formulated about the effects of personality scores at the beginning of the career and subsequent *change* in career role engagement. A recurrent assumption in person-environment theories is that individuals shape their work environment, whether it is by changing employers or by modifying job content, in the pursuit of a better fit. Sutin and Costa (2010), for example, found that individuals high on Emotional Stability had jobs characterized by higher levels of decision latitude, and that emotionally stable individuals actively shaped their jobs over the next 10 years to include even more decision making latitude. The findings suggested that as individuals progress through their careers in midlife, they mold their everyday experiences on the job to fit their personality. Consistent with these findings, we expect the concurrent associations between traits and role engagement at the beginning of the career to be reflected in the pattern of trait effects on change in career role engagement (*Hypothesis 3*). For example, if we succeed in finding a positive association between Agreeableness and initial levels of Guide role engagement at the beginning of the career, then we also expect individuals high on

Agreeableness to increase in Guide role engagement throughout the next 15 years of their career.

Transformation. Finally, the ASTMA model also allows for people to change themselves in response to occupational experiences, a process referred to as *Transformation* (Roberts, 2006). This is undoubtedly the most innovative aspect of the ASTMA model, and draws on the growing body of literature demonstrating some effects of occupational experiences on personality trait development (for an overview of these studies, see Roberts 2006). While several studies have demonstrated the effect of work role *quality* (i.e., satisfaction) on personality trait change (e.g., Scollon & Diener, 2006), research on the effects of work role *content* is still scarce and the established empirical evidence remains modest (Sutin & Costa, 2010).

In the present study, we address the issue of transformation by examining the associations between individual differences in personality trait change and career role engagement. Prior theorizing about these effects (Roberts & Caspi, 2003) has proposed the corresponive principle as a testable hypothesis to examine transformation mechanisms (*Hypothesis 4*). Accordingly, the predominant effects of work experience on changes in personality traits will be on those traits that predict the specific work experience. Consistent with earlier research on reciprocal effects between personality traits and work experiences (e.g., Roberts et al., 2003), the corresponive hypothesis is tested in the present study by examining whether the personality traits that predict career role engagement are the same traits that change in response to these same career roles. It is expected that patterns of predictive relationships between traits and career roles, reflected in the static, concurrent correlations, will be mirrored in the relationships between changes in traits and changes in career roles. For example, if early career engagement in the Guide role is, in part, predicted by higher levels of Agreeableness, then Agreeableness will be the disposition most likely to change in response to increasing Guide role engagement over time.

Method

Participants

To test these hypotheses, data are used from a longitudinal research project on personality development, labor market entrance, and career unfolding in a large sample of Flemish college alumni with measurement occasions in 1994, 1995, 2009, and 2010 (De Fruyt & Mervielde, 1999; Wille et al., 2010). Specifically, data are used from a subsample of 260 participants (137 males and 123 females) who provided personality data in 1994 (T1) and 2009 (T2), and who also provided a complete overview of their career unfolding across the 15-year time interval between both assessment points. Participants' mean age was 22.8 years ($SD = 1.07$) at T1 and 37.9 years ($SD = 1.07$) at T2. Although all participants in this study were highly educated, there was substantial heterogeneity in terms of their vocational preferences. Specifically, the alumni included in this study represented various college and university faculties, including Philosophy, History and Languages ($n = 44$), Law ($N = 27$), Industrial engineering ($N = 58$), Sciences ($N = 19$), Applied Sciences ($N = 33$), Economics ($N = 22$), Psychology and Educational Sciences ($N = 30$), Applied Biological Sciences ($N = 6$), and Political and Social Sciences ($N = 21$). We examined the participants' job titles to get a picture of the type of work they typically fulfilled at T2. There was a large variety of jobs, with occupations ranging from fashion designer to academic professor. The mean number of working hours per week was 41.08 ($SD = 10.77$).

The issue of dropout is inherent to longitudinal studies, especially when time intervals are large. Originally, 934 final year college students participated in the current alumni research project. To test for selectivity in dropout at T2, continuers ($N = 260$) were compared to dropouts ($N = 674$) with regard to their personality scores at T1. The results however showed no significant mean differences between both groups in terms of Big Five scores, $F(5, 928) = 1.45, p > .05$.

Instruments

Personality (T1 and T2). At both T1 and T2, FFM personality traits were assessed using the Dutch adaptation of the NEO-PI-R (Costa & McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996). The Dutch Revised NEO Inventory is a faithful translation of the NEO-PI-R, with a factor structure and psychometric properties closely resembling the normative US Inventory (De Fruyt & Mervielde, 1997). For the present study, internal consistencies of FFM domain scores (T1/T2) were .91/.92 for Neuroticism, .90/.90 for Extraversion, .86/.88 for Openness, .91/.90 for Agreeableness, and .90/.91 for Conscientiousness.

Career role development (T2). Using an interactive web application, semi-standardized reports of participants' career role trajectories (from September 1994 until April 2009) were obtained in two stages. First, they were asked to break this career stage down into successive time intervals according to job and/or organizational changes (for a thorough overview of this methodology, see Wille et al., 2010). In brief, each time unit had to be specified with a starting and ending date and covered at least three months. Respondents were asked to classify each interval as a particular work (e.g., new job with a new employer) or non-work (e.g., career interruption due to sickness) stage, and were invited to report complementary descriptive information (e.g., job titles). In a second phase of the online questionnaire, participants were given an overview of their entire career trajectory as entered in the first stage, and were subsequently asked to score each of the work stages in terms of the importance of each of the six career roles. For this purpose, they were presented a shortened version of the Dutch Career Roles Questionnaire (CRQ; Hoekstra, 2011) to evaluate each work stage. A shortened version was used in order to reduce the testing load for the respondents, given the presumed relatively large number of career changes across these 15 years for some individuals. The questionnaire consisted of 18 items; three items for each of the six career roles, with each item describing an illustrative example of functioning in one career role (see Appendix A). Respondents were asked to indicate on a 7-point scale how well the statement described the role they typically had in their work during that specific work

stage. For the non-work stages, scores on the CRQ were automatically fixed at zero.

In this manner, respondents provided a highly personalized overview of their career role engagement with the total number of work-related career phases as well as the length of these phases varying across and within individuals. This dataset was subsequently reorganized toward a time structured dataset with career role scores for each individual on a pre-defined number of measurement occasions. First, the 15-year time interval (from September 1994 until April 2009) was subdivided into 29 semesters, and each respondent was given career role scores for each semester based on their personal trajectories. When necessary, career role scores of 2 individual career stages were averaged to retain a single semester score. Career interruptions were treated as missing values for the semesters they spanned, using the Full Information Maximum Likelihood approach (*FIML*; Schafer & Graham, 2002) available in Lisrel 8.7 (Jöreskog & Sörbom, 2004). Finally, the number of measurement occasions was further reduced by averaging career role scores across five (only for the first measurement occasion) or four semesters, resulting in seven career stages and accompanying measurement points for each respondent (T1 = September 1994 – February 1997; T2 = March 1997 – February 1999; T3 = March 1999 – February 2001; T4 = March 2001 – February 2003; T5 = March 2003 – February 2005; T6 = March 2005 – February 2007; T7 = March 2007 – February 2009). Compared to other solutions (six or eight measurement points), seven measurement points proved to be the best balance between data reduction and information loss. Exploratory (EFA) and confirmatory (CFA) factor analyses were conducted in order to establish the construct validity of the shortened career roles instrument, using CRQ data that described participants' initial work-related experiences (i.e. first jobs). This enabled us to test the construct validity in the largest sample available. An EFA (principal component analysis and varimax rotation) first indicated that a six-factor solution accounted for 78.6 percent of the variance. Factor loadings indicated that all items loaded primarily and substantially ($> .60$) on their intended factor. Although some items, particularly those from the inspirator-domain, also demonstrated cross-

loadings, these did not exceed .40. Next, a CFA on the shortened CRQ, specifying a measurement model with all items loading on their intended factor, indicated good to acceptable fit indices (normed $\chi^2 = 2.98$, $CFI = .93$, $RMSEA = .07$, $SRMR = .06$). Together, these results provide strong evidence for the construct validity of the shortened CRQ. Internal consistencies of the six career roles, averaged across the seven measurement occasions, were .75 (Director), .82 (Inspirator), .82 (Presenter), .88 (Guide), .81 (Maker), and .93 (Expert).

Statistical Analyses

Preliminary analyses. First, a series of preliminary analyses were performed to explore general indicators of personality trait and career role development. Mean-level stability of observed scores was examined using repeated measures ANOVAs and associated standardized mean differences (d effect sizes). In addition, test-retest correlations were computed to assess the level of relative stability in traits and roles across time.

Latent variable analyses. Latent Change Models (LCMs; McArdle & Nesselroade, 1994) were used to model absolute change in Big Five traits over the two measurements of personality across the 15-year interval. The major advantage of LCMs is that initial level and change are directly estimated as latent variables for each personality factor. This makes it possible to estimate the variance of the latent change factor as a parameter. Rejecting the null hypothesis of zero variance indicates that there are reliable interindividual differences in change. Another attractive feature of these LCMs is that they can also be used in structural models in which change in one variable is related to change in another (Hertzog, Dixon, Hultsch, & MacDonald, 2003). In order to avoid overall model complexity, we trimmed down the number of observed indicators by combining the items of two personality facets into one parcel set. For example, for Neuroticism, the items of N1 Anxiety and N2 Angry Hostility were merged into one parcel, like the items of N3 Depression and N4 Self-Consciousness, and the items of N5 Impulsiveness and N6 Vulnerability. In this manner, each of the Big Five traits was modeled longitudinally with three observed indicators defining the associated latent variables.

The availability of more than three measurements of career role engagement allowed us to apply Latent Growth Curve Models (LGMs; Bollen & Curran, 2006) to examine career development over time. LGMs can address two issues of particular interest for the present study: description of trajectories in career role engagement over time and identification of interindividual variation in the rate of change in career roles.

Finally, having identified the appropriate ways to model personality and career role development separately, we subsequently combined both techniques in a series of 30 (five traits \times six roles) multivariate structural equation models to examine the transactions between both developmental patterns. Correlations of particular interest include the correlations between initial trait levels and subsequent career role slopes which indicate individuals' attempts to shape their work environment. Furthermore, patterns of correlated change (i.e., correlations between trait change factors and career role slopes) illustrate how individuals change in relation to changing career roles. All latent variable analyses were conducted using Lisrel 8.7 (Jöreskog & Sörbom, 2004).

Results

Trait Development

General patterns of personality trait change over the 15 year time interval were first examined at the level of the observed variables. With regard to rank-order stability, the results indicated moderate to high levels of continuity with test-retest correlations equal to .56 for Agreeableness and Conscientiousness, .63 for Openness, .65 for Neuroticism, and .67 for Extraversion. All test-retest correlations were significant at $p < .001$. Regarding mean-level change, the results demonstrated significant decreases in Neuroticism ($d = -.47, p < .001$) and Openness ($d = -.37, p < .001$) between 1994 and 2009. On the other hand, participants significantly increased in Conscientiousness ($d = .46, p < .001$) and Agreeableness ($d = .12, p < .05$). No significant mean-level change was found for Extraversion ($d = -.06, p > .05$).

In a second step, individual level personality trait change was examined using LCMs (see Table 1). These models fitted the data well ($RMSEA < .08$;

Browne & Cudeck, 1993), except for Conscientiousness ($RMSEA = .10$). Nonetheless, comparative fit indices indicated excellent model fits (NFI , $NNFI$, and $CFI > .95$) for all traits, including Conscientiousness.

Of particular interest in these LCMs are the variances associated with the latent change factors, addressing the issue of interindividual differences in personality change. As shown in Table 1, the results showed significant levels of interindividual differences in trait change for each of the Big Five traits. The negative correlations between initial level and change further indicated that individuals who were initially higher on the personality dimensions exhibited greater decreases (or smaller increases for Neuroticism, Openness, and Extraversion) across the follow-up period.

Career Role Development

Parallel to the Big Five trait analyses, developmental patterns in career role engagement were initially examined at the level of the observed variables. First, and consistent with our expectations (*Hypothesis 2*), career roles showed moderate to high levels of rank order stability over the entire 15-year interval. Test-retest correlations were .38 (Expert), .45 (Director), .47 (Inspirator), .48 (Guide), .51 (Maker), .62 (Presenter). All test-retest correlations were significant at $p < .001$.

A series of repeated measures ANOVAs were conducted to assess the level of mean-level change in career role engagement between two successive career stages and across the entire time interval (see Table 2). Standardized mean differences first indicated significant increases in each of the six career roles over the 15-year interval ($d_{1,7}$ varied between .54 and 1.32, $p < .001$). Further, inspection of the effect sizes associated with career role change between two successive time intervals ($d_{t,t+1}$) suggested nonlinear growth in career roles over time, with stronger increases from T1 to T4 compared to the marginal increments from T4 to T7.

Next, individual level career role change was further analyzed using a latent variable approach. Considering the nonlinear trend in career role growth, piecewise growth models (e.g., Bollen & Curran, 2006) were established to

model change in each of the career roles over the 15-year interval (see Figure 1). Piecewise trajectory modeling is meant “to approximate the nonlinear function through the use of two or more linear piecewise splines” (Bollen & Curran, 2006, p. 103). For this purpose, time was coded in a way that expressed piecewise linear change, placing the origin of the time scale (i.e., 0) at the fourth measurement occasion, namely the point at which the steeper increases in each of the career roles changed to less pronounced growth. The slope loadings associated with T1 through T3 (i.e., -3, -2, and -1) indicate the assumed linear growth during the first career stage. Similarly, the slope loadings after T4 (i.e., 1, 2, and 3) define linear growth in career roles during the second stage. These piecewise LGMs fitted the data very well, with RMSEA fit indices varying between .00 and .03.

A summary of these piecewise LGMs is given in Table 3. Inspection of the slope means indeed indicated stronger increases in role engagement during the first compared to the second career half. In addition, mean increases in the Expert and Maker role failed to reach significance during the second career stage. Significant slope variances furthermore indicated interindividual differences in role change during both career stages. The positive correlations between initial slopes and intercepts illustrated that stronger increases in role engagement during the first career stage were associated with higher levels in these roles at T4. On the contrary, the negative correlations between career role levels at T4 and subsequent role changes suggested smaller increases in roles for those scoring higher on these roles at T4. Finally, the negative correlation between both slopes indicated that, except for the Expert role, larger increases in role engagement during the first career stage were associated with smaller increases in these roles during the second stage.

Relations between Traits and Initial Career Role Engagement

Associations between personality and career role engagement were first addressed by examining the concurrent correlations between T1 Big Five traits and retrospective evaluations of career role engagement during the first career stage. The pattern of correlations largely supported our hypotheses on attraction

and selection effects. For Conscientiousness, one significant association was found: as expected (*Hypothesis 1a*), Conscientiousness scores at the beginning of the career were positively related to initial engagement in the Expert role ($r = .13, p < .05$). The expected association between Conscientiousness and engagement in the Maker role could not be confirmed ($r = .08, p > .05$). In line with our expectations, individuals initially scoring higher on Extraversion reported stronger early career engagement in the Presenter (*Hypothesis 1b*; $r = .19, p < .01$), Director (*Hypothesis 1d*; $r = .16, p < .05$) and Inspirator (*Hypothesis 1d*; $r = .19, p < .01$) roles. No significant correlations were found between initial Extraversion and Expert ($r = .03, p > .05$) and Maker ($r = .06, p > .05$) roles.

Finally, one significant association was found for Agreeableness. Consistent with our expectations (*Hypothesis 1c*), individuals initially scoring higher on Agreeableness also reported stronger engagement in the Guide role during the first career stage ($r = .17, p < .01$).

Two significant correlations were found that were not a priori expected. Higher Openness scores at the beginning of the career were associated with stronger engagement in the Presenter role ($r = .17, p < .01$) and scores on Extraversion correlated with initial Guide role engagement ($r = .25, p < .01$). Finally, no significant associations were found between initial levels of Neuroticism and early career role engagement.

Trait Effects on Career Role Development

Longitudinal associations between personality traits and career roles were examined using latent variable models that combined trait LCMs and role LGMs (see Figure 2). These models produced acceptable model fits, with RMSEA indices varying between .03 and .08.

Trait effects on career role development were examined by testing the structural associations between trait levels (representing personality scores at the beginning of the career) on the one hand and career role Slope 1 (representing role change between T1 and T3), role intercept (representing the level of career role engagement at T4), and Slope 2 (representing role change between T5 and

T7) on the other. Building on prior research addressing personality effects on the work environment, we expected the concurrent associations between traits and roles at the beginning of the career to be reflected in trait effects on career role change (*Hypothesis 3*). Based on the significant concurrent associations between traits and roles at the beginning of the career, trait effects on role development were thus expected for Extraversion, Openness, Agreeableness, and Conscientiousness. The results of these analyses are shown in columns two to six of Table 4 (“Level”).

For Extraversion, it was expected that higher trait levels at the beginning of the career were associated with stronger increases in the Presenter, Guide, Director, and Inspirator roles. The results, however, showed no significant associations between level of Extraversion and change in Presenter, Director, and Inspirator roles during both career stages. For the Guide role, we found a significant negative association between Extraversion level and role change during the first career stage ($r = -.15, p < .05$). Extraverts showed smaller increases in this role, whereas more introverted people had stronger increases. Nonetheless, extraverts still scored significantly higher on the Guide role at T4 ($r = .15, p < .05$). Similarly, the results showed that level of Extraversion remained a significant predictor of Presenter ($r = .13, p < .05$), Director ($r = .14, p < .05$) and Inspirator ($r = .21, p < .01$) role scores at T4.

Based on the concurrent association at the career start, we further expected the level of Openness to be associated with change in Presenter role engagement. The results showed that individuals initially scoring higher on Openness did not show stronger increases in the Presenter role during the first ($r = -.01, p > .05$) or the second ($r = .05, p > .05$) career stage, but nevertheless maintained to score higher on this role at T4 compared to individuals initially lower on Openness ($r = .14, p < .05$). Unexpectedly, individuals scoring higher on Openness showed stronger increases in the Expert role ($r = .13, p < .05$), although this effect only reached significance for role change during the second career stage. Similarly, we found a positive effect of initial Openness scores on increases in Maker role during this second career stage ($r = .17, p < .05$).

For Agreeableness, we hypothesized that individuals scoring high on this trait at the beginning of the career would show stronger increases in the Guide role over time. The results, however, did not show significant trait effects on Guide role slopes during the first ($r = -.01, p > .05$) or the second ($r = -.07, p > .05$) career stage, although higher scores on Agreeableness at the beginning of the career were still associated with higher scores on the Guide role at T4 ($r = .19, p < .01$). Unexpectedly, we also found that individuals initially scoring higher on Agreeableness showed stronger increases in the Director role during the first career stage ($r = .15, p < .05$).

Individuals scoring higher on Conscientiousness at the beginning of the career did not show stronger increases in the Expert role during the first career stage ($r = .00, p > .05$), but nevertheless continued to engage more strongly in this role at T4 compared to individuals low on Conscientiousness ($r = .13, p < .05$). Contrary to what could be expected, we found a significant negative association between level of Conscientiousness and Expert role slope during the second career stage ($r = -.15, p < .05$). This indicated that individuals initially lower on Conscientiousness showed greater increases in the Expert role during the second career stage compared to high scorers. Furthermore, the results unexpectedly showed that individuals initially lower on Conscientiousness showed stronger increases in the Director ($r = -.15, p < .05$) and Inspirator ($r = -.17, p < .05$) roles during the second career stage.

Finally, no trait effects on role change were expected for Neuroticism given the lack of concurrent associations at the beginning of the career. Nonetheless, we found one significant effect on career role change: higher scores on Neuroticism at the beginning of the career were associated with stronger increases in the Maker role during the first career stage ($r = .22, p < .01$). At T4, the high scorers on Neuroticism had evolved toward a Maker role level that low scorers had reached earlier, as reflected in the insignificant association between Neuroticism and T4 Maker role scores ($r = .10, p > .05$).

Relations between Change in Traits and Change in Roles

The combined latent variable models were further used to examine associations between change in traits and change in career roles over the 15-year interval. Correlated change was examined by testing the structural associations between personality change factors (representing trait change over the entire 15-year interval) on the one hand and career role slopes on the other. In accordance with the corresponsive principle, we hypothesized that these patterns of correlated change would also reflect the pattern of concurrent associations between traits and career roles at the beginning of the career (*Hypothesis 4*).

We first specifically expected change in Extraversion to be related to change in Presenter, Guide, Director, and Inspirator roles. However, as can be seen in Table 4 (columns “Change”), this was only supported for the Presenter role, with higher increases in Extraversion being associated with higher increases in this role during the second career stage ($r = .16, p < .05$).

Contrary to our expectations, change in Openness was not significantly related to change in the Presenter role during the first ($r = -.06, p > .05$) or the second ($r = .08, p > .05$) career stage. In fact, our results showed that change in Openness was not associated with change in any of the six career roles.

The expected association between change in Agreeableness and change in Guide role also failed to reach significance ($r = -.04, p > .05$ and $r = .06, p > .05$ for the first and second career stage respectively). Change in Agreeableness nonetheless correlated significantly with change in three other career roles. Particularly, increases in Agreeableness were positively associated with increases in the Maker ($r = .14, p < .05$) and Director ($r = .17, p < .05$) roles during the second career stage. In addition, negative associations were found between change in Agreeableness and change in Director ($r = -.24, p < .01$) and change in Inspirator ($r = -.15, p < .05$) roles during the first career stage.

Consistent with the concurrent relations at the beginning of the career, we found a significant positive association between increases in Conscientiousness and growth in the Expert role ($r = .14, p < .05$), although this effect was restricted to role change during the second career stage. Change in Conscientiousness was furthermore positively associated with change in the

Guide role (first career stage; $r = .14, p < .05$), change in the Director role (second career stage; $r = .25, p < .01$), and change in the Inspirator role (first and second career stage; $r = .15, p < .05$ and $r = .26, p < .01$ respectively).

Finally, as scores on Neuroticism were not predictive of engagement in any of the career roles, we did not expect to find evidence for correlated change for this trait. Nonetheless, our results demonstrated that change in Neuroticism was significantly and negatively related to change in Presenter ($r = -.16, p < .05$), Director ($r = -.25, p < .01$) and Inspirator ($r = -.18, p < .05$) roles, although these effects were restricted to the second career stage.

Discussion

Personality Trait Development

The period of young adulthood has been described as an influential stage of life with regard to personality development. Despite the moderate to high levels of rank-order stability in traits that have also been reported previously (e.g., Roberts & DelVecchio, 2000), the results of the present study further substantiate the notion of personality development by documenting on mean-level changes that are in line with the normative developmental patterns (i.e., increases in Conscientiousness and Agreeableness; decreases in Neuroticism and Openness) reported elsewhere (Roberts et al., 2006). Further, the latent variable analyses additionally indicated that each of the Big Five traits also showed significant individual differences in change across the 15-year interval. This strengthens the idea that environmental influences, like vocational experiences, can influence individual's trait change during young adulthood.

Career Role Development

Not only is young adulthood a crucial period in individuals' personal lives, it also imposes a number of defining challenges in the professional sphere. One of the attractive features of this study includes the possibility to follow participants across what are probably the most essential years in their vocational development starting from career entrance. To our knowledge, no prior research has examined career trajectories in working adults over such a long time interval and with such great detail. We found the CRM particularly appealing for this

purpose, as it was explicitly designed for vocational development purposes (Hoekstra, 2011).

Our results indicated substantial mean-level increases in role engagement for each of the six career roles. Furthermore, stronger increases in career roles were found during the first half of the interval compared to the increases during the second half. This nonlinearity in role growth suggests the existence of two different career stages during this period of vocational development. Using Super's (1980) career stage model to describe this type of normative career progression, the first career stage of steeper career role growth indicates the phase of *establishment*, with individuals growing to a specific career identity. The more stable role trajectories over the next seven years conversely suggest a phase of *maintenance*, in which the career identity is further consolidated.

Latent variable analyses also yielded significant variances in the career role slopes, suggesting that not all participants followed these mean-level trajectories to the same extent or even in the same direction. Growth curves further demonstrated that individuals who increased more in role engagement during the first career stage, showed smaller increases during the second stage and vice versa. This indicated a developmental trend toward homogeneity in the sample, with individual differences between participants in terms of career role engagement gradually declining over time. One explanation for this phenomenon may lie in the fact that the participants included in this study were all highly educated, which could explain their shared advancement toward occupational positions similar in terms of underlying roles.

Person-Environment Transactions

A large body of research in the vocational development literature addresses the issue of person-environment fit, assuming that (a) people choose occupational activities that fit with their personal characteristics, and (b) people simultaneously are selected into work environments based on their personal characteristics. Building on these ideas, we hypothesized that traits -through processes of either attraction or selection- would predict initial career role engagement measured early in the career. The present study was the first to

show significant relations between Big Five traits and career role engagement. We specifically found traits, assessed at the very beginning of the career, to be related to retrospective evaluations of initial career role engagement. Moreover, these associations were largely consistent with our hypotheses that assumed a striving for person-environment fit, although the obtained associations were typically modest in magnitude. Individuals scoring high on Conscientiousness reported stronger engagement in the Expert role which is driven by personal motives regarding personal mastery, success, and well-being. Extraverts scored higher on the Presenter and Guide roles, both centered around social interaction, and were also more likely to engage in Director and Inspirator roles, which are typically associated with more decision making opportunities. Stronger altruistic competencies were predictive of stronger Guide role engagement which requires well-developed empathy skills. Finally, an unexpected association was observed between scores on Openness and engagement levels in the Presenter role. According to Hoekstra (2011), the Presenter role focuses on persuasion by means of interpersonal effectiveness with form, style, and impression management. The positive association with Openness possibly illustrates the more creative component of this role.

Interestingly, Neuroticism did not relate significantly to initial engagement in any of the career roles. Although career roles and interests are not the same thing, the observed null findings involving Neuroticism are consistent with research that has found nonsignificant relations between Neuroticism and vocational interests (Larson et al., 2002).

Besides concurrent associations between traits and roles at the beginning of the career, we also expected traits to influence the subsequent pattern of career role development in an attempt to maximize person-environment fit. To examine this, personality trait scores were used to predict career role growth scores during the next 15 years, over and within jobs. We specifically expected individuals to further develop those career roles that they initially preferred based on their baseline personality characteristics.

Although several significant associations were found, evidence for trait effects on role change was weak and the associations that were identified did not

correspond with this developmental hypothesis. In general, we found that the concurrent associations between traits and roles at the beginning of the career were replicated for (static) career role scores in the middle of the 15 year interval. For example, individuals scoring higher on Agreeableness not only reported higher Guide role scores at the career start but also seven years later. However, traits did not predict the role change trajectories as we expected. In the case of Agreeableness, no positive effects were found between initial trait scores and Guide role change during the first or the second career stage.

Taken together, these findings challenge the idea that individuals selectively *increase* in those aspects of the work role that are compatible with their personal characteristics. Two comments can be made here. First, the results may suggest that the idea of “changing the work environment in the pursuit of a satisfying person-environment fit” operates differently when this work environment is defined in terms of the underlying roles. More specifically, it seems that individuals are more motivated to *maintain* a satisfying role position over time rather than striving for *disproportionate increases* in desired roles. Second, it is important to bear in mind that individual differences in career role trajectories are also to a certain extent environmentally determined. Remember that Hoekstra (2011) defines role development as an interactive process of both role taking and role pressure, the latter referring to the impact of external expectations (from supervisors, coworkers,...) and economic necessities. In this regard, it is not uncommon that individuals, through the complex process of career progression, are pushed toward certain occupational positions and associated roles that do not entirely align with their own psychological make-up.

The final mechanism of person-environment transaction that we discuss is transformation, referring to the idea that experiences in professional settings can promote change in personality traits (Roberts, 2006). Consistent with prior research on personality development and work experiences, we expected the traits that “selected” people into specific career roles, whatever the process, to be the same traits that are subject to change in response to those same career roles (Roberts et al., 2003). Although the results of this study provided further

evidence for patterns of correlated change, this was hardly in accordance with the corresponsive principle.

Change in career role engagement was associated with change in four of the five personality traits; only for Openness, no significant associations were found between trait change and change in career role engagement. The results importantly indicate that *increases in career role engagement generally promote normative personality trait development*. For example, normative decreases in Neuroticism are more pronounced in individuals showing stronger increases in Director, Presenter and Inspirator roles. Similarly, normative increases in Conscientiousness are more pronounced in 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 et al., 2003).

However, the results also illustrate how investment in certain aspects of the work role can contribute to *non-normative* trait development (i.e., changes in personality traits that run counter to general trends). Specifically, we found that stronger increases in the Director and Inspirator role 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 has demonstrated that non-normative trait change in young adulthood is associated with de-investment in the work role, like engagement in counterproductive work behaviors (Roberts, Walton, Bogg, & Caspi, 2006). The results of the present study provide interesting new insights in this domain by showing that stronger work role involvement not necessarily contributes to normative personality development, but that the effect depends on the specific work role content.

Limitations and Future Research

A number of limitations to this study should be noted. First, our investigation of personality trait change was limited as only two measurement occasions were available. Although LCMs offer a powerful technique to study

trait change in such a design (McArdle & Nesselroade, 1994), they are limited as they implicitly assume linear change between both measurement occasions. An additional personality assessment in the middle of the 15-year interval may have revealed whether stronger career role change during the first career stage was simultaneously associated with higher levels of trait change in that period.

This study was the first to relate trajectories of work role content to patterns of personality development over the same time interval. To this end, we asked participants to retrospectively report on the importance of each of the six career roles over the past 15 years. We are aware that retrospective evaluations may be partly biased or inaccurate. Nonetheless, the interactive web application that we used for this purpose maximally allowed participants to give reliable and valid descriptions of their career role development. Participants were first asked to reconstruct their own personal career trajectory, based on (objective) job and/or organizational changes. Next, they were asked to reflect on each of these stages by (a) giving a short description of them and (b) evaluating them in terms of the six career roles operationalized in terms of fundamental work characteristics that can easily be remembered. Participants thus reconstructed a personal time line defined by individually relevant marking points. This kind of methodology has been positively evaluated in life course research (Berney & Blane, 1997), particularly since recall has been shown to be substantially improved by introducing a personal temporal reference system for the subject to use (Means, Swan, Jobe, & Esposito, 1991). Of course, we promote future studies addressing dynamic reciprocity using more prospective longitudinal designs.

We chose Hoekstra's (2011) model of career roles to examine PE transactions given its association with identity development in work life, bridging both personal and vocational development. We encourage future researchers to continue exploring PE transactions hereby drawing on other established career models, such as Holland's (1985) RIASOC theory.

Conclusion

Drawing on the success of trait and factor theory, person-environment fit has been proposed as a refined career theory that also incorporated the idea of reciprocity between P and E characteristics. In the present study, we took this evolution a step further and explicitly examined the underlying dynamics of PE fit. Using recent developments from both personality and vocational psychology, we argued for a transactional perspective which proposes trait effects on career unfolding *and* vocational effects on trait development. We introduced the concept of *career identity*, defined in terms of the roles one identifies with and is identified with, as a mediating mechanism between both developmental processes. We believe that this transactional perspective on PE fit contributes to a more comprehensive understanding of the career development process. Further, it opens the door for future innovative research examining the longitudinal and dynamic interplay between personal and vocational characteristics.

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Tables

Table 1

Summary of the Latent Change Models for the Big Five traits

Model	Model fit				Latent variable variance	Change-level correlation
	<i>NFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>RMSEA</i>		
Neuroticism	.99	.98	.99	.06		-.34**
Level					0.85 [†]	
Change					0.49 [†]	
Extraversion	1.00	1.00	1.00	.00		-.42**
Level					0.81 [†]	
Change					0.42**	
Openness	1.00	1.00	1.00	.00		-.26*
Level					0.75 [†]	
Change					0.50**	
Agreeableness	.99	1.00	1.00	.03		-.49**
Level					0.69 [†]	
Change					0.46 [†]	
Conscientiousness	.98	.96	.98	.10		-.43**
Level					0.45 [†]	
Change					0.31 [†]	

Note. * $p < .05$; ** $p < .01$; [†] $p < .001$. Latent variable analyses are based on the entire sample ($N = 260$).

Table 2

Mean-level and rank order stability of career roles across all seven assessment points

	T1		T2		T3		T4		T5		T6		T7														
	Sep '94		Mar '97		Mar '99		Mar '01		Mar '03		Mar '05		Mar '07														
	-		-		-		-		-		-		-														
	Feb '97		Feb '99		Feb '01		Feb '03		Feb '05		Feb '07		Feb '09														
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>d</i> _{1,2}	<i>r</i> _{1,2}	<i>M</i>	<i>SD</i>	<i>d</i> _{2,3}	<i>r</i> _{1,3}	<i>M</i>	<i>SD</i>	<i>d</i> _{3,4}	<i>r</i> _{1,4}	<i>M</i>	<i>SD</i>	<i>d</i> _{4,5}	<i>r</i> _{1,5}	<i>M</i>	<i>SD</i>	<i>d</i> _{5,6}	<i>r</i> _{1,6}	<i>M</i>	<i>SD</i>	<i>d</i> _{6,7}	<i>d</i> _{1,7}	<i>r</i> _{1,7}
Expert	4.20	1.81	4.71	1.71	.29 [†]	.80 [†]	5.04	1.58	.20 [†]	.60 [†]	5.38	1.45	.23 [†]	.52 [†]	5.45	1.46	.05	.44 [†]	5.42	1.54	-.02	.42 [†]	5.52	1.51	.07 [*]	.79 [†]	.38 [†]
Maker	5.16	1.39	5.41	1.39	.18 [†]	.80 [†]	5.66	1.27	.19 [†]	.68 [†]	5.78	1.17	.10 [*]	.52 [†]	5.79	1.18	.01	.50 [†]	5.78	1.22	-.01	.52 [†]	5.85	1.16	.06 [*]	.54 [†]	.51 [†]
Presenter	3.43	1.63	3.83	1.73	.24 [†]	.85 [†]	4.11	1.76	.16 [†]	.77 [†]	4.44	1.72	.19 [†]	.66 [†]	4.59	1.69	.09 ^{**}	.65 [†]	4.66	1.71	.04	.62 [†]	4.81	1.70	.09 [†]	.83 [†]	.62 [†]
Guide	3.81	1.68	4.15	1.67	.20 [†]	.80 [†]	4.53	1.65	.23 [†]	.66 [†]	4.90	1.60	.23 [†]	.55 [†]	5.02	1.55	.08 [*]	.54 [†]	5.07	1.56	.03	.50 [†]	5.21	1.51	.09 [†]	.88 [†]	.48 [†]
Director	2.99	1.50	3.64	1.66	.41 [†]	.75 [†]	4.08	1.65	.27 [†]	.60 [†]	4.51	1.67	.26 [†]	.45 [†]	4.74	1.62	.14 [†]	.44 [†]	4.88	1.67	.08 [*]	.41 [†]	5.06	1.64	.11 ^{**}	1.32 [†]	.45 [†]
Inspirator	3.87	1.50	4.29	1.52	.28 [†]	.81 [†]	4.57	1.49	.18 [†]	.68 [†]	4.92	1.41	.24 [†]	.56 [†]	5.03	1.38	.08 ^{**}	.52 [†]	5.14	1.35	.09 [*]	.49 [†]	5.24	1.34	.07 [*]	.97 [†]	.47 [†]

Note. * $p < .05$; ** $p < .01$; † $p < .001$. Career role scores are computed on a scale from 1 to 7. Test-retest correlations r indicate the relative or rank order stability of career role engagement between two assessment points. Standardized difference scores d represent the effect sizes for mean-level change. Due to missing values, N ranges between 243 and 248 for test-retest correlations and between 243 and 258 for mean-level changes.

Table 3
Summary of the piecewise latent growth curves for the career roles

Model	Model fit <i>RMSEA</i>	Latent variable mean	Latent variable variance	Slope1- intercept <i>r</i>	Intercept- Slope2 <i>r</i>	Slope1- Slope2 <i>r</i>
Expert	.02			.38 [†]	-.25 ^{**}	-.05
Slope1		0.39 [†]	0.16 [†]			
Intercept		5.36	2.08			
Slope2		0.04	0.12 [†]			
Maker	.02			.38 [†]	-.38 [†]	-.34 [†]
Slope1		0.20 [†]	0.18 [†]			
Intercept		5.75	1.49			
Slope2		0.03	0.08 [†]			
Presenter	.03			.43 [†]	-.28 ^{**}	-.25 ^{**}
Slope1		0.33 [†]	0.23 [†]			
Intercept		4.44	2.29			
Slope2		0.12 [†]	0.10 [†]			
Guide	.00			.41 [†]	-.35 [†]	-.22 [*]
Slope1		0.36 [†]	0.24 [†]			
Intercept		4.89	2.38			
Slope2		0.11 [†]	0.13 [†]			
Director	.00			.59 [†]	-.42 [†]	-.41 [†]
Slope1		0.50 [†]	0.31 [†]			
Intercept		4.52	2.74			
Slope2		0.18 [†]	0.12 [†]			
Inspirator	.03			.42 [†]	-.48 [†]	-.24 [*]
Slope1		0.33 [†]	0.20 [†]			
Intercept		4.91	2.00			
Slope2		0.11 [†]	0.06 [†]			

Note. * $p < .05$; ** $p < .01$; [†] $p < .001$. Latent variable analyses are based on the entire sample ($N = 260$).

Table 4

Correlations representing the structural relations in the combined SEM models

Roles	Traits									
	Level					Change				
	N	E	O	A	C	N	E	O	A	C
Expert										
Slope1	.04	.09	.15	.06	.00	.06	-.15	-.04	-.08	-.08
Intercept	.02	-.03	.00	-.02	.13*					
Slope2	-.03	.03	.13*	-.02	-.15*	.02	.06	.03	.07	.14*
Maker										
Slope1	.22**	-.07	.06	-.06	-.04	-.07	.12	-.07	.02	-.01
Intercept	.10	-.04	.05	-.03	.04					
Slope2	-.04	-.04	.17*	-.04	.00	.00	.06	-.03	.14*	-.05
Presenter										
Slope1	.04	-.01	-.01	.00	-.01	-.04	-.02	-.06	-.05	.10
Intercept	-.03	.13*	.14*	-.04	-.12					
Slope2	-.06	.00	.05	-.06	-.03	-.16*	.16*	.08	.11	.08
Guide										
Slope1	-.09	-.15*	-.03	-.01	-.08	.13	.12	.09	-.04	.14*
Intercept	.00	.15*	.07	.19**	-.01					
Slope2	-.02	.05	-.01	-.07	-.05	-.08	.00	-.07	.06	.10
Director										
Slope1	-.11	.06	.00	.15*	-.04	.10	-.01	-.03	-.24**	.13
Intercept	-.11	.14*	-.04	.10	-.01					
Slope2	.01	.05	.13	-.13	-.15*	-.25**	.07	-.05	.17*	.25**
Inspirator										
Slope1	.00	.08	-.02	.06	-.07	-.02	-.05	-.03	-.15*	.15*
Intercept	.02	.21**	.11	.04	-.03					
Slope2	-.07	.12	.11	.03	-.17*	-.18*	-.05	.02	.08	.26**

Note. * $p < .05$; ** $p < .01$. Latent variable analyses are based on the entire sample ($N = 260$).

Figures

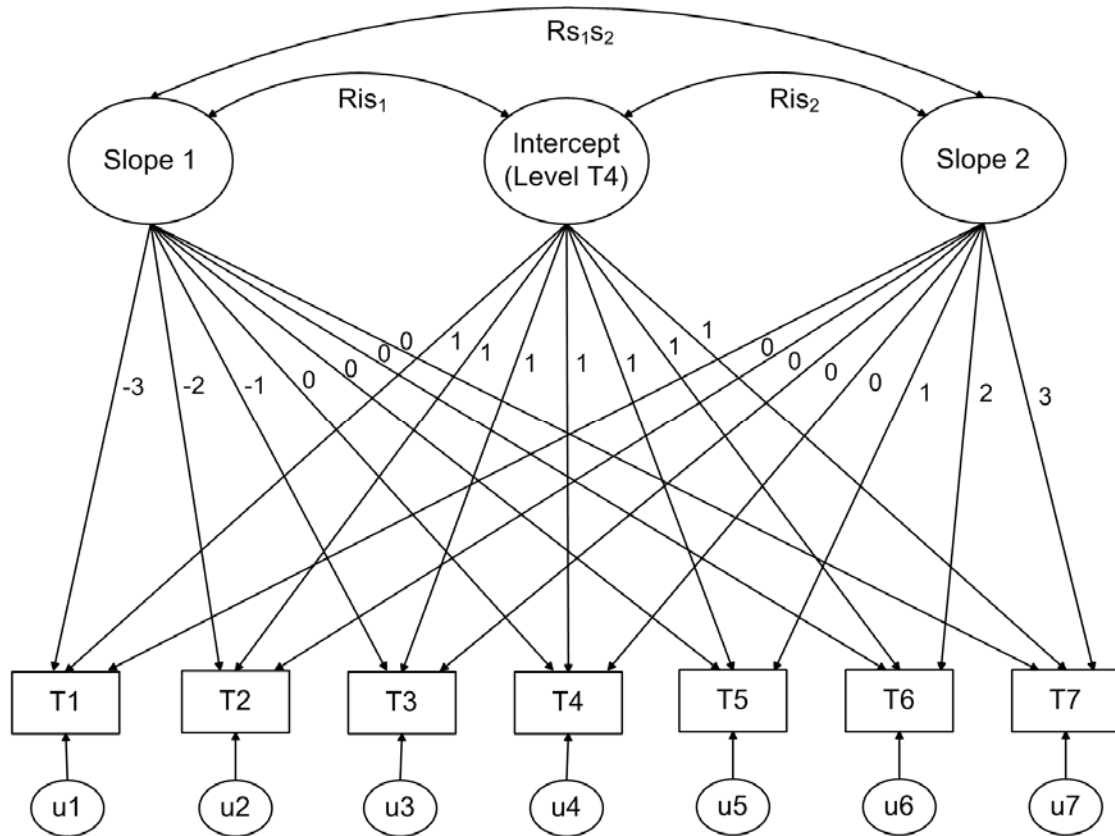


Figure 1. Piecewise latent growth model of career role change across seven measurement occasions (T1 through T7). The model incorporates a latent intercept and two slopes. Note that the intercept in this model represents the fourth measurement occasion; Slope 1 represents change in career role engagement prior to T4; Slope 2 represents change after T4. U_1 through u_7 indicate random error associated with the observed data. The paths from the latent slopes to the observed scores imply two linear growth functions, one prior to T4 (loadings -3, -2, and -1) and one after T4 (loadings 1, 2, and 3). The relationship between the intercept and the slopes is represented by the correlations between the intercept and the slopes (R_{is_1} and R_{is_2}). $R_{s_1s_2}$ represents the relationship between both slopes.

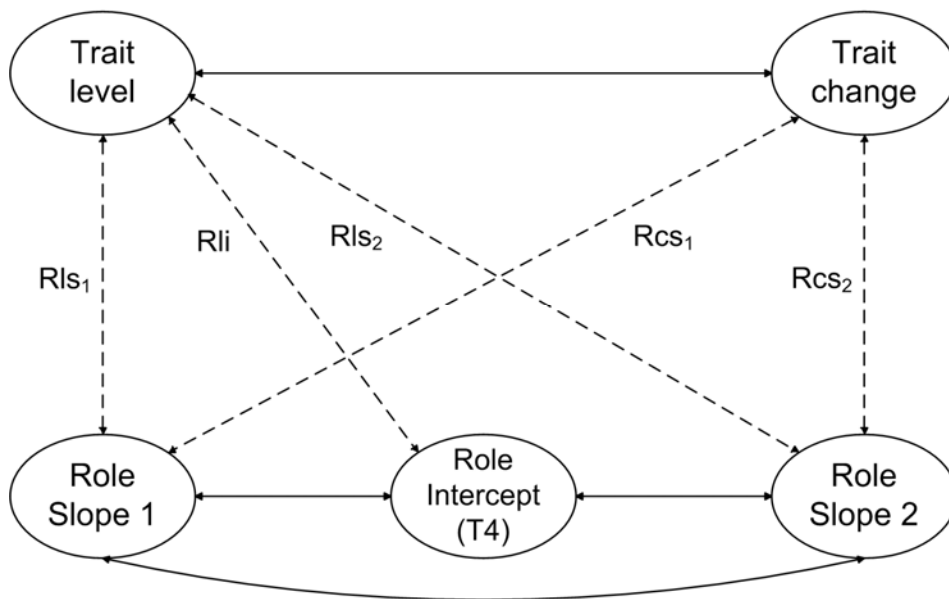


Figure 2. Combined structural equation model to test transactions between personality and career role development over time. Dotted lines indicate the structural relations of interest: Rls_1 and Rls_2 represent the correlation between initial Trait level and change in career role engagement during the first (from T1 to T3) and second (from T5 to T7) career stage respectively. Rli represents the correlation between initial Trait level and level of career role engagement at T4. Rcs_1 and Rcs_2 represent the correlation between Trait change and change in career role engagement during the first and the second career stage respectively.

Chapter 7

Vocations as a source of identity: Reciprocal relations between Big Five personality traits and RIASEC vocations over 15 years

Abstract

Although work is a core part of life, the direction of influence from personality to work has typically been conceived as only unidirectional. The present study aims to contribute to the literature by considering reciprocal relations between personality and occupational characteristics, drawing on current perspectives from personality psychology (i.e. neo-socioanalytic theory) and using a well-established framework to conceptualize career development (i.e. Holland's RIASEC theory). For this purpose, a longitudinal cohort of college alumni ($N = 266$) was tracked across a substantial and significant period in their professional career. Big Five personality traits and RIASEC occupational characteristics were assessed at the career start and 15 years later when their careers had unfolded. A combination of observed and latent variable analyses was used to disentangle the longitudinal and reciprocal relations between traits and occupational characteristics. Our results indicate that personality shapes and is shaped by our vocational experiences, demonstrating how work can be a source of identity. The implications for theory and research on personality in the I/O literature are discussed alongside a number of practical implications for organizational and counseling settings.

Introduction

Individuals often seek out, create, evoke, or are selected into experiences that are compatible and correlated with their personality (Caspi & Bem, 1990; Roberts, 2007; Scarr & McCartney, 1983; Snyder & Ickes, 1985). In the work domain in particular, there is now substantial evidence that people prefer and obtain occupational environments that fit their personality traits (Barrick, Mount, & Gupta, 2003; Betz, Borgen, & Harmon, 2006; De Fruyt & Mervielde, 1999; Gottfredson, Jones, & Holland, 1993; Woods & Hampson, 2010). But what happens with individuals once they are in such environments? Do they adapt to the specific environmental demands that are characteristic for their occupation? In other words: How do our occupations shape who we are?

In 1982, Michael Frese wrote an article unambiguously entitled: “Occupational socialization and psychological development: An underemphasized research perspective in Industrial Psychology”. The conclusion of his review was clear, stating that a significant dearth of research has addressed issues regarding *occupational socialization*, defined as those changes in the person which take place in and because of the work situation (Volpert, 1975). Interestingly, more than 20 years later, Judge and colleagues, in their review on the contributions of personality to organizational behavior (Judge, Klinger, Simon, & Yang, 2008), came to the same conclusions. They specifically noted that despite recent advances in the personality literature on trait development, “*much remains to be known about the role work plays in changes of personality*” (p. 1994).

In contrast to the well-established findings concerning occupational selection, to date we have no satisfying answer to the fundamental question whether and how work environments influence the development of basic psychological features, such as personality traits. Two principal reasons can be identified for this lack of research initiatives. First, studies on work socialization should also treat personality traits as dependent variables in addition to their more familiar status of predictor variables, therefore acknowledging that traits have the potential to change over time. For some, this may be a delicate perspective in I/O psychology, as evidence for the stability of traits has earlier

been put forward as an important step in the emerging consensus about the usefulness of personality assessment in organizational contexts (Judge et al., 2008). Second, the study of work socialization processes requires very specific research designs that are challenging to carry out. As occupational socialization is a process that unfolds over time, one needs a longitudinal design with repeated measurements of both personal as well as occupational characteristics to capture the dynamics between both. Moreover, the time interval has to be large enough, as changes in personality traits typically occur at a modest rate and over relatively long time intervals (e.g., 10 years; Roberts & Wood, 2006). Finally, it has been argued that the study of occupational socialization requires job analysis instruments that are embedded in psychological theories relevant for the study of development. Specifically, it is necessary to use measures of job characteristics which are psychologically meaningful and theoretically consistent (Frese, 1982).

The present study is unique in that it can draw on a research program that meets these high standards. We specifically depart from a well-documented college alumni project in which participants are tracked across a substantial and crucial period in their vocational lives, i.e. the first 15 years of their professional careers. We start this study where previous research on person-occupation fit left off, that is by re-examining patterns of occupational selection (De Fruyt & Mervielde, 1999). Using these findings as a starting point, the focus of the present investigation is on occupational socialization, framed in the Theory of Work Adjustment (Dawis & Lofquist, 1984). Work adjustment theory specifies how people may act in case of incongruence between their own characteristics and the work environment. A distinction is made between “Active adjustment” or briefly *Activity*, that is the reduction of lack of correspondence by acting to change the environment; and “Reactive adjustment” or *Reactivity*, which refers to the reduction of lack of correspondence by acting on oneself, for example by changing personal characteristics (i.e., interests, values, etc). In the present study, we specifically examine whether and how early career occupational characteristics predict subsequent changes in personality traits (i.e. reactivity effects), and vice versa, i.e. whether and how personality traits predict changes

in occupational characteristics over time (i.e. activity effects). Finally, co-development of personal and occupational characteristics are investigated through patterns of correlated change, describing whether and how changes in personality traits are associated with simultaneous changes in occupational characteristics over the same time interval.

Our study contributes to the literature in several ways. Although the idea of occupational socialization has been around in I/O psychology theory for over three decades (e.g., Frese, 1982), and even longer in the sociological literature (e.g., Van Maanen, 1976), very little empirical work has been done up until now to challenge these propositions. The present study offers a unique possibility to test the reciprocal relations between personality traits and work environments, whereas previous research has exclusively considered the unidirectional associations between both (e.g., Judge, Higgins, Thoresen, & Barrick, 1999; Woods & Hampson, 2010). Theoretically, we propose an integration of recent perspectives from the personality literature (e.g., Social Investment Principle; Roberts, Wood, & Smith, 2005) and established theory from vocational psychology (e.g., Holland's vocational type theory; Holland, 1985). As we will discuss, cross-fertilization of these perspectives allows for a better understanding of the occupational socialization phenomenon for both personality and applied psychologists. For the latter, it is important to acknowledge that personality traits are not essentially fixed, but continue to develop and change throughout adulthood in and in response to work environments. Personality psychologists, on the other hand, should acknowledge that work as a central life domain is not something uniform, but that substantial differences exist between work environments in terms of underlying role demands that may differentially influence trait change.

Personality Trait Change in Adulthood

Occupational socialization is defined as changes in the person which take place in and because of the work environment (Frese, 1982). This concept thus implies that (a) working adults change over time, and that (b) work environments influence these changes. A substantial body of research now

indicates that personality traits continue to change during adulthood, with the preponderance of change occurring between the ages of 20 and 40 years (Roberts, Robins, Caspi, & Trzesniewski, 2003). Normative developmental changes such as the tendency of people to become more agreeable, conscientious, and emotionally stable have been observed in multiple birth cohorts and nations, using both longitudinal and cross-sectional designs (McCrae & Terracciano, 2005; Roberts et al., 2005). Diverging theoretical explanations exist, however, to account for these normative trait changes. From the perspective of the Five-Factor Theory of personality (McCrae & Costa, 2003), these normative changes result uniquely from a specific genetic predisposition to change, independent from environmental influences. From an alternative perspective, environmental approaches to trait change, such as the Social Investment Principle (Roberts et al., 2005), posit that investment in social institutions and roles promotes personality development across adulthood. 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, 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/her personality shifts to reflect the expectancies of that role. In terms of work role investment, it is presumed that as individuals become increasingly committed to their career, they should experience changes in their personality traits that generally accommodate the demands of the workplace. Hereby, it is generally assumed that traits such as Agreeableness, Emotional Stability, and especially Conscientiousness accommodate workplace functioning (Hudson, Roberts, & Lodi-Smith, 2012). Drawing on this Social Investment Principle, Hudson and colleagues (2012) recently showed that increases in social investment in work (measured as a composite of job involvement, work centrality, and organizational citizenship behavior) were associated with increases in Conscientiousness. No significant associations were found, however, for the other Five-Factor Model (FFM; McCrae & Costa, 1987) traits.

Findings supporting social investment perspectives are informative for applied psychologists as they indicate that personality traits continue to change throughout adulthood and that work experiences can play a role herein. What this perspective seems to disregard, however, is that the work role is not at all uniform, and that underlying role demands can vary substantially across different occupational environments. It is now a well-established fact in the I/O literature that job type is a significant moderator of personality-performance associations (Penney, David, & Witt, 2011). Some research has, for instance, indicated a positive association between Agreeableness and performance in jobs involving strong interpersonal interactions (Mount, Barrick, & Stewart, 1998). On the other hand, a negative association has also been identified between Agreeableness and success in managerial functions (Boudreau & Boswell, 2001). Findings such as these indicate that traits that are accommodating in one vocational environment may be of less use or even a hindrance in others. The major implication is that the effect of work role investment on personality change probably depends on the specific requirements that are characteristic for a given work environment.

Occupational Environments and Trait Change

Where applied psychologists can inform personality researchers is in providing validated and comprehensive models that can account for these differences among occupational environments. The most widely used and researched model of occupational environments is contained in Holland's theory of vocational personalities and work environments (Holland, 1958, 1996, 1997). Six occupational environments are described in this model that pose very different requirements to individual employees (Holland, 1997). In the Realistic (R) environment, the focus is on manipulating things; these can be machines, plants or animals. This environment fosters technical competencies and achievements, and encourages workers to see the world in simple, tangible, and traditional terms. Typical R jobs include building construction, team assembler, and civil engineer. By contrast, workers in Social (S) environments mainly deal with other people, to cure, develop, or inform them. This environment fosters

social competencies, and encourages people to see the world in flexible ways. Typical S jobs include childcare worker, nurse, and counseling psychologist. Investigative (I) environments are dominated by environmental demands and opportunities that entail observation and creative investigation of physical, biological, or cultural phenomena. This environment fosters scientific competencies and achievements and encourages workers to see the world in complex, abstract, and original ways. Typical I jobs can be found in medicine and science, and include laboratory technician, computer system analyst, and chemist. Workers in Enterprising (E) environments are required to persuade and/or manipulate others in order to attain organizational or self-interest goals. This environment fosters enterprising competencies and achievements, and workers are encouraged to see the world in terms of power, status, and responsibility. Typical E jobs can be found in sales and management, and include product promoter, sales agent, and marketing manager. The Artistic (A) work environment is dominated by demands and opportunities that entail ambiguous, free, unsystematized activities and competencies to create art forms or products. Artistic competencies and achievements are stimulated, and workers in these environments are encouraged to see the world in complex, independent, and unconventional ways. Typical A jobs can be found in the creative sector, including actor, musician, and landscape architect. Finally, central in the Conventional (C) work environment are demands and opportunities that entail the explicit, ordered, systematic manipulation of data such as keeping records, reproducing materials, organizing data according to a prescribed plan, and operating business and data processing equipment. This environment fosters conventional competencies and achievements, and workers are encouraged to see the world in conventional, stereotyped, constricted, and simple ways. Typical C jobs are clerk, accountant, and librarian.

Holland's person-environment fit theory is best known as a theory of occupational selection that proposes that people gravitate to work (or educational) environments that match their personal characteristics (i.e. traits and interests). It is far less widespread, however, that this theory also proposes reciprocal effects. People in Enterprising work environments, for instance,

“acquire or are reinforced for traits such as ambition, energy, assertiveness, sociability, etc.” (Holland, 1997, p. 47). These “secondary effects”, which essentially describe processes of occupational socialization, are a central but still heavily underexposed aspect of Holland’s theory.

How can investment in these various occupational environments lead to trait change? Theoretical approaches dedicated to explain how situational demands can shape an individual’s personality assume that sustainable changes in traits are usually preceded by behavioral changes (Fleeson & Jolley, 2006; Roberts, 2006, 2009; Roberts & Jackson, 2008). The key idea in the sociogenomic model of personality (Roberts & Jackson, 2008) is that environmental experiences affect personality traits in a bottom-up fashion. Specifically, it is assumed that role demands create a reward structure promoting self-regulated and consistent changes in behavior that, if extended, may cause changes in traits through a bottom-up process (Bleidorn, in press). That is, behavioral changes (besides changes in thoughts and feelings) *“take on a significant mediational role as they account for the path through which prolonged environmental effects will change neuroanatomical structures or gene expression, and thus change personality traits”* (Roberts, 2009, p. 141).

The sociogenomic model of personality traits further describes at a micro level how and which are the experiences that may change personality traits (see Figure 1). For this purpose, the model focuses on the state-level manifestations of personality traits. Traits are manifested through stable, enduring patterns of states (thoughts, feelings and behaviors) and are responsible for future states. This implies that environmental experiences can affect personality traits only indirectly, mediated through personality states (Path A in Figure 1). Importantly, traits are not the only causes of state level behaviors, thoughts and feelings. These states may be partly due to the specific situation or experience that a person is embedded in (Path B in Figure 1), and the focus on states due to both traits and experiences provides a straightforward explanation for variability in behavior (Roberts & Jackson, 2008). Note that such variability in states does not invalidate the existence of a trait because experiences do not directly influence personality traits. Instead, experiences can affect personality traits only

indirectly, mediated through personality states (Paths A & B in Figure 1). Trait change is thus thought to occur by relatively consistent experiences that lead to lasting changes in the way one behaves, thinks, or feels. These long-term shifts may occur unconsciously. For example, being around extraverted colleagues may act as a contagion, where one's assertiveness increases due to one's desire to fit in and not stand out.

Imagine someone in a strong Enterprising vocational environment (e.g., a management function), where the focus is on the manipulation of others to attain organizational or self-interest goals (Holland, 1997). These work role demands create an atmosphere in which this individual is stimulated to engage in Enterprising activities, such as sales or leading others. Besides behaving in this role-congruent manner, this individual is also encouraged to see him/herself as aggressive, popular, self-confident, and as possessing leadership and communication abilities (Holland, 1997). Over time, it can be expected that these characteristic behaviors, thoughts, and feelings translate into the acquisition or reinforcement of traits such as ambition, assertiveness, energy, dominance, and sociability. Note that these are probably also the traits that got people selected into this Enterprising environment in the first place (De Fruyt & Mervielde, 1999). Although these occupational socialization effects and the theoretical mechanisms underlying them seem very plausible, to date no empirical work has been done to systematically test this principle of reciprocity.

The Present Study

The present study has the general objective of extending prior research on the associations between personality and occupational characteristics by looking beyond selection effects. Specifically, we use these findings concerning occupational selection as a basis for more innovative hypotheses and research questions regarding the reciprocal associations between personality and occupations over time. De Fruyt and Mervielde (1999) demonstrated in a sample of college alumni that personality traits, measured three months prior to graduation, predicted occupational selection one year later. Neuroticism was not significantly related to the environmental types, whereas Extraversion was

related to employment in Enterprising ($r = .35, p < .01$), Social ($r = .25, p < .01$) and, to a lesser extent, Conventional ($r = .13, p < .05$) environments. Openness to experience was positively correlated with employment in Social ($r = .28, p < .01$), Artistic ($r = .25, p < .01$), and Enterprising environments ($r = .12, p < .05$), but negatively correlated with Realistic ($r = -.15, p < .05$) environments. Agreeableness was negatively related to working in jobs with Artistic ($r = -.15, p < .05$) and Enterprising ($r = -.16, p < .05$) features. Finally, Conscientiousness was negatively related to working in Artistic jobs ($r = -.12, p < .05$), but correlated positively with employment in Enterprising ($r = .17, p < .05$), Conventional ($r = .15, p < .05$), and Realistic ($r = .12, p < .05$) environments. These correlations, although moderate, supported the idea of a match between occupational characteristics and FFM traits (De Fruyt & Mervielde, 1999).

We here present a follow-up of this research, and particularly focus on the processes that follow occupational selection. Our research model is illustrated in the middle part of Figure 2 (dotted lines). Our primary focus lies on the issue of occupational socialization: Do people's personality traits change under the influence of those occupational environments that they selected or were selected in? In terms of the Theory of Work Adjustment, we label these socialization effects "Reactivity" (Path B₂ in Figure 2). In addition, we also examine the effects of initial personality trait levels on subsequent change in occupational characteristics. Do people further adjust their occupational environment to make it more congruent over time? These effects are labeled "Activity" (Path B₁ in Figure 2). Finally, given that both occupational characteristics and personality traits are presumed to change over time, we will also investigate patterns of correlated change (Path C in Figure 2).

Because we will argue that these reciprocal effects over time are connected to initial selection effects, we will also re-examine the effects of initial personality traits on initial occupational environments (Path A in Figure 2). Although these selection effects have been examined before (De Fruyt & Mervielde, 1999), it is important to re-establish these in our restricted longitudinal sample as these results will serve as a basis for the innovative hypotheses concerning reciprocal relations.

Hypotheses

Past research suggests that reactivity/socialization and selection effects are intimately related. There is an overlap between the experiences selected through personality traits and the changes that result from those same experiences (Neyer & Lehnart, 2007; Roberts, Caspi, & Moffitt, 2003; Robins, Nofle, Trzesniewski, & Roberts, 2005). That is, life experiences do not impinge themselves on people in a random fashion. Rather, selection effects set in motion socialization effects, wherein the personality traits that people already possess are deepened and elaborated by trait-correlated experiences. This pattern is described as the *corresponsive principle* and has been proposed as the most probable type of personality change that occurs over the life course (Roberts, Wood, & Caspi, 2008). Specifically, experiences that are in line with one's dispositions (selection) will be viewed as validating and rewarding, thus resulting in changes in the traits (i.e. socialization) that brought the person to the experience in the first place. For example, individuals who score high on Extraversion are more likely to select occupations with strong Enterprising characteristics (De Fruyt & Mervielde, 1999). Based on this corresponsive principle, engagement in these occupations should be associated with changes in Extraversion such that people become even more extraverted over time. This brings us to the following hypothesis concerning reactivity/occupational socialization effects:

Hypothesis 1: Selection and reactivity/socialization effects are linked by a corresponsive principle. That is, traits that got people selected into certain occupational environments are the most likely to change under the influence of these same occupational characteristics in such a way that these traits are deepened and elaborated.

Besides selecting a fitting environment, gravitational theories typically assume that, over the course of one's career, people actively shape their work environment in order to enhance person-environment fit (i.e. Active adjustment). Two main mechanisms can be discerned when this idea of activity is framed within a career context. First, people may decide to leave their work

environment and change it for another in order to enhance congruence. Research has, for instance, indicated that career changers tend to choose new jobs that are more congruent with their personality profiles (Donohue, 2006; Oleski & Subich, 1996). Second, individuals may also consciously as well as unconsciously attempt to modify their concrete work environment in order to maximize fit. This is in line with the ideas behind job crafting (Wrzesniewski & Dutton, 2001) and job sculpting (Bell & Staw, 1989) which entail that individuals can affect their day-to-day work experience by altering the tasks they do, organizing their work differently, or by changing the nature of the relationships they maintain with others (Wrzesniewski & Dutton, 2001). Sutin and Costa (2010), for instance, found that individuals high on emotional stability occupied jobs that are characterized by higher levels of decision latitude, and that emotionally stable individuals actively shaped their jobs over the next 10 years to include even more decision making latitude. Findings such as these suggest that as individuals progress through their careers, they mold their everyday occupational experiences to fit their personality. Moreover, the example cited above indicates that this activity mechanism is connected with initial selection effects. Specifically, this suggests that selection effects at the beginning of the career should persevere over time. This means that, over time, individuals are expected to selectively strengthen those occupational characteristics that were also preferred at the career start. If, for instance, we find Extraversion to be positively associated with Enterprising characteristics at the beginning of the career, then we also expect individuals high on Extraversion to demonstrate increases in Enterprising characteristics over the next 15 years. Conversely, if a negative association between certain traits and specific occupational characteristics at the career start exists, then individuals are expected to further adjust their work environment over time in order to downsize these disliked occupational characteristics. This is summarized in the following hypothesis:

Hypothesis 2: Selection effects are also reflected in the activity effects. That is, associations between traits and occupational characteristics at the beginning of the career will also be reflected in the prospective effects of trait levels on subsequent changes in occupational characteristics.

Selection effects lead a person to have an experience whereby the experience then leads to changes in personality traits. However, as a person changes in response to an experience, they are likely to select into and evoke different experiences consistent with their personality. This indicates a bi-directional and dynamic process where changes in one construct (a personality trait) leads to changes in another (an experience), and then back again (personality trait change). The reciprocal effect paths in our research model (Paths B₁ and B₂ in Figure 2) address the (static) prospective effects of initial trait levels on subsequent changes in occupational characteristics and vice versa. Correlated change (Path C in Figure 2) addresses the (dynamic) association between changes in traits and changes in occupational characteristics over time. Correlated change is essential to understanding life-span development, as it provides evidence of personality and social roles enhancing one another over time (Hertzog & Nesselroade, 2003; Scollon & Diener, 2006; Sliwinski, Hofer, & Hall, 2003). The present study is the first to shed a light on the co-development of FFM traits and RIASEC occupational environments over time. We specifically expect these patterns of correlated change to follow the corresponsive principle; that is, we expect these change correlations to reflect the initial level correlation. This specifically means that changes in occupational characteristics should be associated with changes in those personality traits that got people selected into these environments in the first place. If, for instance, we find Extraversion to be positively related to the selection of Enterprising occupations, then changes in Enterprising characteristics should also be positively associated with changes in Extraversion over time. This translates into the following hypothesis:

Hypothesis 3: Selection and correlated change are linked by a corresponsive principle. That is, correlations between changes in personality traits and occupational characteristics are expected to reflect the initial level associations between both.

Method

Design and Participants

To test these hypotheses, data were used from a longitudinal research program on individual differences and career unfolding in a well-documented college alumni sample. Previous studies have used data from this research project to illustrate the importance of FFM personality traits regarding initial job choice (De Fruyt & Mervielde, 1999), early career work adjustment (De Fruyt, 2002), career transitions (Wille, Beyers, & De Fruyt, in press; Wille, De Fruyt, & Feys, 2010) and career success attainment (Wille, De Fruyt, & De Clercq, in press; Wille, De Fruyt, & Feys, in press).

In 1994, 934 final year undergraduates from various faculties enrolled in this study filling out personality inventories three months prior to graduation (for a thorough description of the sample see De Fruyt & Mervielde, 1999). One year later (1995), a first follow up was conducted asking participants to report on their current status and nature of employment one year after graduation. A second follow up was organized in 2009, reassessing participants' personality 15 years after the first assessment and gathering information on their past career trajectories and levels of success attainment. Finally, a third follow up was organized in 2010, now focusing on participants' current nature of employment after 15 years on the labor market. The present study is unique in that it addresses the reciprocal relations between FFM traits and RIASEC occupational characteristics over the entire time interval captured by this longitudinal study. Data are used from all 4 assessment points, although we here consider the initial assessments of personality (1994) and employment situation (1995) as Time 1 (T1) assessments; and the re-assessments of personality (2009) and employment situation (2010) are considered Time 2 (T2) assessments.

The issue of dropout is inherent to longitudinal research designs, especially when time intervals are large. In the design presented here, dropout was possible on three occasions (1995, 2009, 2010), and participants were invited to participate even when they did not respond on earlier occasions. 266 participants were included for the current study who all provided T1 ratings of personality *and* T2 assessments of their current employment situation. Of these 266 participants, 216 (81.2%) also provided valid T2 ratings of personality, and 179 (67.3%) also provided T1 employment assessments. We first examined attrition effects by inspecting whether and how our selected sample of 266 participants differs from the original sample in terms of baseline (T1) personality traits and occupational characteristics. With regard to FFM personality traits, we found that on average the “continuers” ($N = 266$) scored significantly higher than the “dropouts” ($N = 668$) on T1 Extraversion ($t(931) = -2.12, p < .05$) and T1 Openness ($t(931) = -2.10, p < .05$), although the effect sizes were small ($d = -.15$ and $-.21$ respectively). For those who had valid T1 assessments of occupational characteristics, we also inspected whether “continuers” ($N = 178$) differed from “dropouts” ($N = 377$) in terms of baseline RIASEC scores. Only one significant difference was found: On average, we found continuers to score higher on T1 social characteristics compared to dropouts ($t(548) = -2.23, p < .05, d = -.20$). In sum, it could be concluded that the differences between our selected longitudinal sample and the original T1 sample in terms of baseline personality and RIASEC scores were limited in number and small in magnitude.

In a second step, we also inspected the pattern of missing values in our selected longitudinal sample. Schafer and Graham (2002) recommend the use of Maximum Likelihood (ML) estimation procedures that take into account all the available data for each participant, so that missing information can then be partially recovered from earlier or later waves (see also Schafer, 1997). To justify the use of ML estimation, however, the data should be missing (completely) at random (MCAR), which can be tested using Little’s (1988) multivariate test implemented in the SPSS Missing Value Analysis module. When applied to the 22 variables included in our longitudinal dataset (5 traits, 6

RIASEC dimensions, 2 assessment points), Little's test revealed missings in this sample of 266 participants to be completely at random (MCAR; $\chi^2 = 212.60$, $df = 228$, $p > .05$), showing that the probability of nonresponse in this sample is unrelated to any of the assessed study variables.

The selected sample consisted of 135 male and 131 female alumni. Although all highly educated, participants were heterogeneous in their vocational interests, with alumni representing various college faculties including Industrial engineering ($N = 54$), Philosophy, History, and Languages ($N = 43$), Law ($N = 32$), Sciences ($N = 20$), Applied sciences ($N = 27$), Economics ($N = 25$), Psychology and Educational sciences ($N = 36$), Applied Biological sciences ($N = 4$), and Political and Social sciences ($N = 25$). Participants' mean age at T1 (1994) was 22.35 years ($SD = 1.65$).

Measures

Personality traits. At both T1 (1994) and T2 (2009), FFM traits were assessed using the Dutch validated version of the NEO PI-R (Costa & McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996). The NEO PI-R is a comprehensive personality questionnaire, measuring 5 broad and 30 more specific traits by means of 240 items that are to be scored on a 5-point Likert scale. The Dutch adaptation has satisfactory psychometric characteristics and factor loadings closely resembling the loading matrix reported in the normative US NEO PI-R manual (Costa & McCrae, 1992, p. 44; De Fruyt & Mervielde, 1999).

Occupational characteristics. Participants described their current work environments at T1 (1995) and T2 (2010) using the Dutch adaptation of the Position Classification Inventory (PCI), initially developed by Gottfredson and Holland (1991) and translated into Dutch by Hogerheijde, Van Amstel, De Fruyt, and Mervielde (1995). The PCI assesses the resemblance of work environments to Holland's theoretical RIASEC types. The PCI was developed to gauge the characteristics of the environment adequately and comprehensively (Gottfredson & Holland, 1991; Holland, 1997). For this purpose, each environmental type is assessed with 14 items, covering the activities involved in the job, the traits and abilities required for the job, and the personal styles and

values that are valued in the job. Each of the 84 items are scored on a 3-point Likert scale. Intercorrelations between all (observed) study variables and Cronbach alpha internal consistencies are reported in Table 1.

Analyses

A combination of observed and latent variable analyses were conducted. First, in order to get a sense of the general patterns of stability and change in personality traits and work environments, test-retest correlations and repeated measures ANOVA's were computed using observed Big Five personality and RIASEC occupation scores. Next, we used Latent Change Models (LCMs; McArdle, 1980; McArdle & Nesselroade, 1994) to examine the central research questions of this study, i.e. the associations (concurrent and prospective) between personality traits and work environments, as well as the concurrent longitudinal change between traits and occupations. A latent change model uses two waves of data to estimate the intercept ("Level" factor) and slope ("Change" factor) of a variable over time, controlling for measurement error. Figure 2 contains the latent change model used in the present study.

At each time point, latent variables were constructed to represent individuals' personality and RIASEC occupation scores. For the latent personality factors, NEO PI-R facet scores (6 per Big Five domain) were used as observed indicator variables. Latent occupational environment variables were created by parceling the PCI items within each RIASEC scale. To create each parcel four to five scale items were averaged. Parcels tend to be more reliable and more normally distributed compared to single items and are thus better at meeting the assumptions of maximum likelihood estimation (Allemand, Zimprich, & Hertzog, 2007; Jackson et al., 2009). Additionally, parcels reduce the number of estimated parameters and, therefore, reduce the complexity of the second order latent change model, resulting in better model fit. Selecting the three highest loading items from a factor analysis created three parcels. These three items anchored each of the three parcels. The remaining items were distributed into each parcel by adding the fourth highest loading to the first parcel, the fifth highest to the second parcel, and so on until all the items were

allocated (Little, Cunningham, Shahar, & Widaman, 2002). As shown in Figure 1, second-order latent level and change factors were then estimated from the Time 1 and Time 2 latent scores using fixed 1 regression coefficients. Factor loadings of item parcels (for RIASEC scales) or personality facets (for Big Five domains) are constrained equal over time.

One of the advantages of LCMs is that they are tolerant of missing data. The fact that missingness in our longitudinal sample of 266 participants was completely at random allowed us to use the Full Information Maximum Likelihood (FIML; Schafer & Graham, 2002) approach to deal with these missings. FIML is a pragmatic missing data estimation approach for structural equation modeling which has been shown to produce unbiased parameter estimates and standard errors under MCAR. This procedure was moreover preferred over alternatives such as those using only complete case data ($N = 147$) or data imputation (e.g., expectation maximization); both of which can lead to biased estimates (Hox, 2000; Wothke, 2000). Specifically, this approach better represents the entire sample rather than just the subsample of alumni who have no missing data while still providing appropriate tests of statistical significance that reflect the amount of missing data for each variable. All latent variable analyses were conducted using LISREL8.72 (Jöreskog & Sörbom, 2004) which provides the Root Mean Square Error of Approximation (RMSEA) to evaluate goodness of fit in case of FIML estimation. The main focus in the present study, however, is on the evaluation of the parameter estimates.

Another benefit of the LCM is that it lets us simultaneously estimate the latent correlation between T1 levels of personality and occupational characteristics (path A in Figure 1), the prospective relation between T1 levels and change over time (paths B in Figure 1), as well as the simultaneous latent change between personality and occupational characteristics (path C in Figure 1), all uncontaminated by measurement error. LCMs, hence, cover all three fundamental research questions of the present study: latent level correlations address occupational selection effects; cross-lagged relations address activity (path B₁) versus reactivity (path B₂) effects; and finally latent change correlations address correlated change.

Results

Change and Stability of Traits and RIASEC Scales

Table 2 summarizes the general patterns of stability and change in Big Five personality traits and RIASEC environment dimensions over the 15 year interval. Our results first indicate moderate to strong levels of rank-order stability in personality traits, with test-retest correlations ranging between .48 ($p < .001$) for Conscientiousness and .69 ($p < .001$) for Extraversion. Similarly, moderate to relatively high test-retest correlations were found for the six RIASEC occupation scales, varying between .23 ($p < .01$; Enterprising characteristics) and .51 ($p < .001$; Artistic characteristics). Further, repeated measures ANOVAs indicated significant mean changes in four of the Big Five traits: On average, participants decreased in Neuroticism ($d = -.48, p < .001$) and Openness to experience ($d = -.42, p < .001$) while simultaneously increased in Agreeableness ($d = .21, p < .01$) and Conscientiousness ($d = .54, p < .001$). Regarding the RIASEC occupation scales, four significant mean level changes were observed: While participants' occupations -on average- decreased in Realistic characteristics ($d = -.39, p < .001$), mean level increases were found in Social ($d = .46, p < .001$), Enterprising ($d = .75, p < .001$), and Conventional ($d = .85, p < .001$) characteristics.

In addition to these observed variable analyses, eleven univariate LCMs were also estimated (see column 'Latent scores' in Table 2). The results first indicated excellent to acceptable model fit indices for all univariate LCMs. Note that *LISREL* only reports *RMSEA* fit indices when missings are treated using *FIML* techniques, and that $.00 \leq RMSEA \leq .08$ indicates excellent to acceptable model fit. Univariate LCMs further indicated significant negative correlations between latent level and change factors, indicating that higher initial scores were accompanied by stronger decreases or smaller increases over the next 15 years. Finally, before considering changes in personality traits and RIASEC occupation scales as dependent variables, it is appropriate to first test whether there is statistically significant variation in individual differences in change (Hudson et al., 2012). In this case, we checked for significant individual differences in change by testing for statistically significant variance in the latent change

parameters. This requirement was met, as we found significant variance in the change factors for all Big Five personality traits and all RIASEC vocation scales (all $ps < .001$). Thus, ample differences in change existed in both sets of variables that could be predicted.

Cross-Lagged Latent Change Models

In a second step, the associations between Big Five personality traits and RIASEC occupation scales were analyzed using a set of 30 (5 traits \times 6 vocation scales) multivariate cross-lagged LCMs. Results first indicated adequately fitting models, with *RMSEA* indices ranging between .03 and .07. Parameter estimates are summarized in Table 3. Note that the threshold for significant correlations varies by model, due to the fact that each model estimates a separate variance-covariance matrix, and the subsequently estimated standard errors for each correlation differ based on these matrices.

Selection effects. Table 3 first displays the estimated correlations at T1 between personality traits and the RIASEC occupational characteristics (i.e. selection effects; path A in Figure 1). Note that although these associations are labeled “concurrent”, they do reflect predictive relations because personality traits were assessed one year prior to vocational characteristics. The results in Table 3 (columns A) indicated that all but initial Realistic occupational characteristics were significantly predicted by at least one T1 personality trait. Levels of Neuroticism negatively predicted initial Enterprising characteristics ($r = -.17, p < .05$); Extraversion positively predicted initial Social ($r = .24, p < .01$) and Enterprising characteristics ($r = .39, p < .001$); Openness to experience positively predicted initial Artistic ($r = .30, p < .001$) and Social characteristics ($r = .14, p < .05$), and negatively predicted initial Conventional characteristics ($r = -.14, p < .05$); Agreeableness negatively predicted initial Investigative ($r = -.26, p < .01$) and Enterprising characteristics ($r = -.14, p < .05$); and Conscientiousness positively predicted initial Investigative ($r = .20, p < .01$) and Enterprising characteristics ($r = .17, p < .05$). Only initial Realistic characteristics were not significantly predicted by any of the T1 personality trait scores.

Activity and reactivity effects. In predicting changes in personality and vocational characteristics, we first examined whether static personality levels at T1 predicted subsequent change in occupational characteristics (i.e. activity effects; path B₁ in Figure 1). The results in Table 3 (columns B₁) first show that personality traits predicted future change in Realistic, Artistic, Social, Enterprising, and Conventional characteristics. Specifically, changes in Realistic characteristics were negatively predicted by initial levels of Openness ($\beta = -.15$, $p < .05$), while changes in Artistic characteristics were positively predicted by initial Openness ($\beta = .22$, $p < .01$). Changes in Social characteristics were positively predicted by initial levels of Neuroticism ($\beta = .14$, $p < .05$), Openness ($\beta = .28$, $p < .001$), and Agreeableness ($\beta = .12$, $p < .05$). Changes in Enterprising characteristics were negatively predicted by initial levels of Agreeableness ($\beta = -.12$, $p < .05$). Finally, changes in Conventional characteristics were positively predicted by initial levels of Neuroticism ($\beta = .12$, $p < .05$). In order to get a sense of what these effects look like, RIASEC change patterns (based on repeated measures ANOVA's) of T1 personality trait low scorers (first quartile) versus T1 personality trait high scorers (fourth quartile) were plotted in Figure 3. Panel A first shows that individuals initially higher on Neuroticism had stronger increases in Social and Conventional occupational characteristics. Further, Figure 3 (Panel B) shows that individuals initially higher on Openness had stronger decreases in Realistic characteristics, smaller decreases in Artistic characteristics, and stronger increases in Social characteristics. Finally, individuals initially high on Agreeableness had stronger increases in Social and smaller increases in Enterprising characteristics (Figure 3, Panel C).

Despite this substantive evidence that personality traits predicted subsequent changes in occupational characteristics, these activity effects generally failed to be consistent with the initial selection effects. Of the ten selection effects that were identified, only three were also reflected in activity effects. Moreover, four activity effects were identified without prior selection effects.

Substantial evidence was also found for reactivity effects, represented by the prospective effects of initial occupational characteristics on subsequent personality trait change (path B₂ in Figure 1). As can be seen in Table 3 (columns B₂), initial Realistic characteristics negatively predicted changes in Neuroticism ($\beta = -.20, p < .01$), and positively predicted changes in Agreeableness ($\beta = .16, p < .05$) and Conscientiousness ($\beta = .17, p < .05$). Levels of Investigative characteristics were positively associated with changes in Agreeableness ($\beta = .15, p < .05$), whereas initial Enterprising and Conventional characteristics negatively predicted changes in Agreeableness ($\beta = -.21, p < .01$ and $\beta = -.22, p < .01$, respectively) and Openness ($\beta = -.19, p < .05$ and $\beta = -.14, p < .05$, respectively). In order to interpret these reactivity effects, personality trait change patterns (based on repeated measures ANOVA's) of T1 low scorers (first quartile) versus T1 high scorers (fourth quartile) were plotted in Figure 4. Panel A illustrates how individuals in initially strong Realistic occupations had stronger decreases in Neuroticism, while at the same time stronger increases in Agreeableness and Conscientiousness over the next 15 years. Further, it can be seen (Panel B) that individuals in initially stronger Investigative occupations demonstrated stronger increases in Agreeableness compared to those in less prominent Investigative occupations at T1. Finally, Figure 4 shows that individuals in initially stronger Enterprising (Panel C) and/or Conventional (Panel D) occupations demonstrated stronger decreases in Openness and smaller increases in Agreeableness compared to individuals in less prominent Enterprising/Conventional occupations at T1.

Despite this substantive evidence that occupational characteristics predicted subsequent changes in personality traits, these reactivity effects largely failed to be in accordance with the hypothesized corresponive principle. In fact, of the eight reactivity effects, only the effects of Conventional characteristics (on change in Openness) and Enterprising characteristics (on change in Agreeableness) were corresponive with the concurrent T1 associations.

Correlated change. Finally, we also examined whether individual differences in trait change were associated with individual differences in RIASEC scale changes (path C in Figure 1). As can be seen in Table 3 (columns

C), changes in personality traits were associated with simultaneous changes in Artistic, Social, and Enterprising characteristics. Keeping in mind the mean change tendencies in personality traits and occupational characteristics, we specifically found stronger decreases in Artistic vocational characteristics to be associated with stronger decreases in Openness to experience ($r = .19, p < .05$). Further, stronger increases in Social vocational characteristics were associated with smaller decreases or even increases in Extraversion ($r = .17, p < .05$). Finally, stronger increases in Enterprising vocational characteristics were associated with smaller decreases or even increases in Extraversion ($r = .20, p < .01$), smaller increases in Agreeableness ($r = -.14, p < .05$), and stronger increases in Conscientiousness ($r = .15, p < .05$). Interestingly, the comparison of initial selection effects and patterns of correlated change provides some support for the hypothesized corresponsive principle: Five out of ten occupational selection effects were followed by significant correlated change that was in the expected direction. Furthermore, no correlated change was found for traits and occupational characteristics that did not show initial level associations as well.

Discussion

In this study, we examined the reciprocal relations between personality traits and occupational characteristics in a longitudinal sample of college alumni. Our general objective was to extend previous research in this area which exclusively considered the unidirectional effects of personality on occupational characteristics, commonly referred to as selection or gravitation effects (De Fruyt & Mervielde, 1999; Judge et al., 1999; Woods & Hampson, 2010). We were specifically interested in the understudied topic of occupational socialization: How do our occupational experiences shape who we are?

For this purpose, we conducted a follow-up of existing research by De Fruyt and Mervielde (1999), now focusing on the reciprocity of personality and work over time. Given that personality trait change is a process that typically occurs at a modest rate over long periods of time (Roberts & Wood, 2006), a study design was adopted that covered a substantial and significant period of

time, namely the first 15 years of people's professional careers following graduation from college. Previous research has indicated that these years are particularly important with regard to personality trait change during adulthood. In the professional sphere too, this is a crucial phase in which individuals choose a certain career which can then be further crafted in order to adequately fulfill professional needs. This first period of paid employment has, moreover, been suggested to be the most important in occupational socialization (Frese, 1982).

Another noteworthy strength of this study concerns the taxonomies that we used to assess personality (i.e., the FFM) and occupational characteristics (i.e., Holland's RIASEC dimensions) across time. Specifically, these taxonomies: (1) are comprehensive, (2) are well-established in the relevant literatures, and (3) have the advantage that their concurrent and prospective associations have sufficiently been documented by previous research. A distinct oversight in many longitudinal studies of personality trait change is the inclusion of meaningful assessments of situations, contexts, or roles (Roberts & Wood, 2006). Moreover, inspection of the literature on personality-work interactions in personality psychology typically shows a rather simplistic conception of the work role, often disregarding important differences across various occupational environments in terms of underlying roles or requirements. The recurrent idea in the personality literature is that work role investment, like other forms of social investment such as establishing a family, promotes normative personality trait changes in the direction of greater functional maturity (e.g., increases in Conscientiousness, Emotional Stability, and Agreeableness). By considering the broad spectrum of RIASEC occupational characteristics, we could test our central assumption that the effect of work role investment on personality change depends on specific characteristics of this work role, a key feature of occupational socialization.

Drawing on well established vocational theory (i.e. Holland's 'secondary effects'), and supported by recent findings from the personality literature concerning the corresponive principle (Caspi, Roberts, & Shiner, 2005; Roberts, Caspi, et al., 2003), we specifically proposed that occupational selection effects at the beginning of the career would drive subsequent

reciprocal effects which we labeled *activity*, *reactivity*, and *correlated change*. A re-examination of the selection effects in our restricted longitudinal sample and using multivariate LCMs produced slightly different results compared to the FFM-RIASEC correlations that were initially reported (De Fruyt & Mervielde, 1999, p. 715). Some associations now became sufficiently strong to reach the level of statistical significance (e.g., the negative association between Neuroticism and Enterprising characteristics), whereas others now became nonsignificant (e.g., the positive association between Conscientiousness and Conventional characteristics). Several explanations can be put forward for these observed differences. First, it needs to be acknowledged that these selection effects were re-examined in a subsample of the original sample of college alumni. Although our attrition analyses indicated only small differences between both samples in terms of baseline personality and occupational characteristics, this does not rule out that the associations between the variables under consideration can slightly differ in this restricted sample. Second, differences can also be (partially) attributed to the fact that we compare correlations between observed variables with correlations between latent variables. Statistically, the use of latent variable models reduces the biasing effects of measurement error and provides more valid estimates of effects among constructs of interest (Coffman & MacCallum, 2005). Finally, it needs to be stressed that in many of the cases, the differences between these observed and latent variable associations were minimal, and mostly concerned marginal shifts across the thin line of statistical significance.

Having re-established these occupational selection effects, we expected these to (a) persevere over time into activity effects, whereby individuals selectively deepen those occupational roles that were initially selected, (b) to set in motion reactivity effects whereby traits that got people selected into certain occupational environments are the most likely to change under the influence of these same occupational characteristics in such a way that these traits are deepened, and (c) to be mirrored in patterns of correlated change. This longitudinal dynamic interplay between traits and work experiences was, thus, hypothesized to reflect the corresponsive principle of personality development.

Although ample evidence was found for each of these three effects, the general pattern clearly was less straightforward than hypothesized.

Only three out of the ten selection effects were also reflected in the activity effects. Openness to experience was positively associated with initial levels of Artistic and Social characteristics, as well as with changes in both occupational characteristics; individuals higher on Agreeableness not only occupied less Enterprising occupations at the career start, but they also showed smaller increases in these Enterprising characteristics over the next 15 years. In addition, we also identified four activity effects that were unprecedented by significant selection effects. Over time, individuals higher on Neuroticism seek comfort in stronger Social environments where the focus is on cooperation rather than competition, and increasingly seek out the reassuring security and predictability that is characteristic for Conventional environments. Similarly, individuals higher on Agreeableness further craft their careers in a Social direction at the expense of Enterprising characteristics. Finally, we found that individuals higher on Openness, who are characterized by broad-mindedness, increasingly turn away from occupations with stronger Realistic characteristics, which stimulate inflexible, conforming and dogmatic thinking (Holland, 1997). Despite the fact that these activity effects did not directly connect with initial selection effects, they can, thus, easily be interpreted in a conceptually sound manner. Moreover, these findings illustrate the difference between occupational selection (i.e. the short-term effect of traits on occupational characteristics) and occupational gravitation (i.e. the long-term effect) and point out activity effects as the missing link between both.

The reactivity effects in our statistical models can be interpreted as evidence for occupational selection, whereby selected occupations predict subsequent changes in the person. It is first important to point out that by adopting Holland's RIASEC framework, we focused on *occupational* socialization which transcends the level of concrete *jobs*. Put simply, a job is work for which one receives pay (e.g., teacher at school X); an occupation is a wide category of jobs with similar characteristics (e.g., educator, physician, or scientist). Although participants might have changed *jobs* one or more times

during this first career stage (see also Wille et al., 2010), our results indicated moderate to strong rank-order stability in *occupational* characteristics. People scoring higher (lower) on certain occupational characteristics at the beginning of the career, also scored higher (lower) on these characteristics 15 years later relative to the same sample of college alumni. This indicates that, for many participants, these initial occupations were not just a ‘tryout’ but were indeed representative for the rest of their career, justifying the examination of the prospective effects of initial occupational characteristics on subsequent personality trait change.

Little evidence for correspondiveness in reactivity effects was found, as only two of the ten identified selection effects set in motion the hypothesized socialization effects. Individuals lower on Agreeableness were more likely to select / to be selected into stronger Enterprising occupations, and these Enterprising characteristics in turn mitigated the normative increases in Agreeableness. Similarly, individuals higher on Openness were less likely to select / to be selected into stronger Conventional occupations, and these Conventional characteristics in turn amplified the normative decreases in Openness. Six additional reactivity effects were found, however, that did not align with the selection effects identified at the career start. Enterprising characteristics also stimulated normative decreases in Openness, and Conventional characteristics mitigated normative increases in Agreeableness. The reactivity effects associated with these two occupational characteristics uncover an interesting feature of occupational socialization: Work experiences serve to shape those personality traits that promote effective functioning in a specific occupational context, even if these occupational socialization effects run counter to normative developmental patterns (i.e. smaller increases in Agreeableness). Enterprising-Conventional occupations (e.g., managerial functions) require a competitive mindset and create an atmosphere of conventional, materialistic attitudes (Holland, 1997). This study was the first to provide evidence for Holland’s hypothesized secondary effects: People in such occupational environments are further encouraged to see themselves as ambitious, domineering and aggressive, and become less open to new beliefs

and practices, leading to a narrow range of interests and a closed belief system (Holland, 1997, pp. 46-48).

Although not a priori hypothesized, we also found interesting socialization effects induced by Realistic and Investigative occupational characteristics. Realistic occupational characteristics predicted stronger increases in Agreeableness and Conscientiousness, and stronger decreases in Neuroticism. Involvement in more Realistic work roles, thus, seems to stimulate the normative pattern of personality change that is typically observed during adulthood and which drives individuals toward greater functional maturity. This is consistent with Holland's hypothesized secondary effects for this occupational environment, which include a reinforcement of traits such as conformity, persistence, and stability (Holland, 1997, p. 44).

Finally, the socialization effect of Investigative characteristics on change in Agreeableness was in the opposite direction of what would be expected based on the corresponive principle. Individuals high on Agreeableness were first less likely to select / be selected into stronger Investigative occupations (negative selection effect). This could be explained by the fact that many of the early career Investigative work environments in the present study were (pre) doctoral research jobs, in which rational, analytical and radical thinking are probably valued higher than compassion, compliance, and interpersonal warmth. Opposite to the corresponive principle (and to Holland's hypothesized secondary effects), we found individuals in stronger Investigative occupations to demonstrate more pronounced increases in their levels of Agreeableness (positive socialization effect). One potential explanation for this effect could be that many individuals in these early career research jobs are "late bloomers", who eventually "catch up" under the influence of other important sources of social investment responsible for normative trait change. Choosing for a graduate research position in many cases also involves choosing for a prolongation of student life, possibly reflecting a certain level of immaturity, such as reflected in lower levels of Agreeableness. However, under the influence of other social investment processes, such as the establishment of deeply committed romantic relationships, a catch-up in terms of personality trait

development towards greater functional maturity could be initiated, as reflected in the greater increases in Agreeableness.

Finally, in order to capture the full dynamic of trait-occupation interactions, correlated change was also inspected to investigate co-development of personality and work over time in addition to the prospective effects. Although not *all* selection effects resulted in correlated change, evidence was nonetheless found for correspondiveness as traits were most likely to change in association with changes in those occupational characteristics that were selected in the first place. Given that the prospective effects in our models provided evidence for activity (traits predicting change in occupational characteristics) as well as for reactivity effects (occupations predicting change in traits), at least these patterns of correlated change indicate that personality and occupations influence each other over time.

Implications for Theory

The main theoretical contribution of this study entails the installation of a new model of personality psychology into the literature. Personality in I/O psychology is typically conceptualized as traits, and traits are conceived as endogenous causal forces used to predict outcomes. This traditional conceptualization of traits as predictor variables that are essentially fixed has greatly served applied psychologists in their focus on validity aspects of personality for various organizational and career outcomes. However, to date this version of personality psychology adopted in the I/O literature proves to be overly static. Trait models that do not incorporate the transactions between personality and situation over time fail to account for conceptual or empirical findings of personality development (Fraley & Roberts, 2005). Personality psychology has now convincingly demonstrated that traits continue to change in adulthood, and that life experiences play a role therein (Hudson et al., 2012; Jackson, Thoemmes, Jonkmann, Luedtke, & Trautwein, 2012; Lodi-Smith & Roberts, 2007; Roberts, Caspi, et al., 2003). Moreover, the need for a revised perspective on personality has recently also been demonstrated by Wu and Griffin (2012) who found work experiences (i.e. job satisfaction) to shape core

self-evaluations, which organizational researchers previously conceptualized as a stable trait. By showing in this study that work environments can significantly influence patterns of FFM trait change through processes of occupational socialization, we further substantiated this call for a revised conceptualization of personality in which traits and work experiences are in constant transaction. Moreover, we clarified the basic mechanisms (e.g., state-trait interactions) describing how occupational experiences may shape who we are.

We believe that this reconceptualisation of personality in the I/O literature also holds important implications for well-established theories on workplace functioning. Trait Activation Theory (TAT; Tett & Burnett, 2003), for instance, is now widely accepted as a person-situation interactionist model of job performance that specifies the conditions under which particular personality traits will predict effective functioning in particular jobs. In light of the present study and supported by recent insights in the personality literature regarding trait change, a reformulation of TAT would allow for a more complete understanding of personality functioning at work. Specifically, what seems to be missing in this model is a bi-directional association between personality and work behavior, whereby repeated activation of certain traits that are favorably evaluated in certain work environments (i.e. the amalgam of task level, social level, and organization level work demands) could, over time, result in a further development of these traits.

Finally, in addition to bringing some recent advances regarding trait development from the personality literature to I/O psychology, our study also informs personality psychologists how to refine their theory on personality change. Our findings indeed support the assumption that investment in the work role may serve to further develop those traits that are accommodating for effective functioning at work (Hudson et al., 2012), but at the same time illustrate that this effect of work role investment on personality development depends on the specific characteristics or requirements in that work environment. This further means that in some work environments (e.g., stronger Enterprising environments), the effect of occupational socialization may be to stimulate normative changes in certain traits (e.g., stronger decreases in

Openness), while at the same time buffering other normative changes (e.g., smaller increases in Agreeableness). We would like to compare these findings to those recently reported by Jackson and colleagues (2012), who found a similar long-lasting influence of military experience on personality trait change. Compared with a control group, military recruits had lower levels of Agreeableness after training, and these levels persisted five years after training, even after participants entered college or the labor market. Although we do not want to equate Enterprising occupations with the military, a joint consideration of these effects is insightful because it indicates that the effect of life experiences on trait change depends on the specific characteristics of that experience. It can be concluded that a more complete understanding of occupational socialization requires a refinement of the Social Investment Perspective on personality development in such ways that *differences between* work environments, e.g. in terms of Holland's framework, can no longer be ignored.

Practical Implications

For more than half a century now, Holland's RIASEC theory of vocational personalities and work environments has had a tremendous impact in applied areas of vocational and counseling psychology (Nauta, 2010). Our central finding that personality not only predicts, but is also predicted by (change in) occupational characteristics sheds a new light on this theory and its applications. Typically in vocational guidance settings, traits (or related constructs such as interests) are assessed by the counselor in order to gain insight into the underlying motivations and/or preferences of clients. This information is subsequently used to guide people through the processes of selecting the right environments (at the beginning of a professional or educational career) or reorienting a career. Acknowledging reverse (i.e. occupational socialization) effects, however, opens the door for an additional set of valuable interventions, whereby personality and work environments should be treated as interactional rather than seeing traits as fixed and jobs as fitting to them. First, this information is helpful for counselors in order to understand

certain changes in clients which they often cannot adequately pinpoint themselves. Consider, for instance, the tough manager who -at a certain point in his/her career- experiences increasing difficulties in adequately combining the competitiveness of a strong Enterprising work role with the need for compassion in other (e.g., romantic) life roles. It may be very insightful for such people to know about these occupational socialization effects, to identify those work role demands that trigger these effects, and to learn how to adequately separate effective ways of functioning in different life domains.

From a broader perspective, findings regarding the changeability of basic personality traits are important for applied psychologists given the centrality of personality assessment in different organizational settings including personnel selection, coaching and development. Combined with recent findings reported by Wu and Griffin (2012) regarding the malleability of trait core self-evaluations, our results are particularly informative for applied psychologists interested in targeted personality change. To give one example, personality trait assessments are frequently used in coaching and development (De Fruyt et al., 2009). The utility of using such assessments is usually framed as helping people to understand both personal strengths and areas of inconsistency between traits and work requirements. The thorny issue of change is usually approached by proposing behavioral change, thereby sidestepping the question about personality change because traits are assumed to be stable over time. If there are real developmental influences on traits from work experiences, then it may logically follow that people can, if they wish, change aspects of their personality based on exposure to new kinds of activity and environments, reinforcement and practice. Such change may be more than simple behavior change, but rather influence sense of identity at its core, and perceptions of one's own traits. Of course, more research is needed to support these assertions.

Limitations and Future Research

In addition to these theoretical and applied implications, the limitations of this study should be noted. First, personality and occupational characteristics were measured on only two occasions; thus our longitudinal analyses were

limited in several ways. One consequence is that our latent change models could only estimate linear change patterns, whereas previous research has indicated that changes in traits (e.g., Hopwood, Donnellan, Blonigen, & Krueger, 2011) as well as occupational characteristics (e.g., Wille, Beyers, et al., in press) may also follow non-linear trajectories. In addition, with only two measurement occasions, the investigation of bi-directionality is limited as only the prospective effects of personality levels on subsequent changes in occupational characteristics and vice versa can be examined. In designs with more than two assessment points, the direction of effects can be tested more elaborately by testing alternative cross-lagged models that incorporate more than one change factor for each variable (Ferrer & McArdle, 2003; Ferrer & McArdle, 2010). Second, all study variables were assessed using self-reports only, which may be a source of common method bias. The use of a longitudinal design, however, alleviates such concerns because at no point we examined associations between variables that were assessed at exactly the same time. Finally our research questions were examined in a sample of college alumni only, which means that all participants were highly educated. It remains an open question whether similar reciprocal effects between personality and occupational characteristics can be identified in people with more diverse educational levels.

Alongside these study limitations, a number of directions for future research can also be delineated. First, the general finding that the association between personality and work is bidirectional rather than unidirectional should be further examined against a broader range of work-related criteria. For instance, there is now a large body of evidence supporting the validity of traits to predict work-family conflict (Allen et al., 2012) and burnout (Swider & Zimmerman, 2010). Given the significance of these outcomes for an individual's personal well-being, one could expect such work experiences to also shape people's personality over time. Second, to date we do not know whether some traits are more vulnerable to change than others given specific appropriate (e.g., trait-activating) environmental characteristics. Our results indicated, for instance, that individuals' Agreeableness scores increased more slowly in Enterprising jobs, but a moderating effect on people's Openness scores was not

observed in more Artistic environments. Does such observation imply that Openness is more resistant to change than Agreeableness? Finally, this kind of research on the changeability of personality traits could also open the door for studies on personality change through coaching. As indicated earlier, the goal of employee coaching is often to adjust aberrant or maladaptive tendencies (De Fruyt et al., 2009). However, an overview of the literature suggests that consideration of personality in coaching to date has focused primarily on understanding and ameliorating problematic behaviors, rather than changing traits themselves (Martin, Oades, & Caputi, 2012).

Conclusions

For many people, occupations are one of the defining features of adult life and, hence, a significant source of identity. The absence of a literature on how work affects personality development may represent one of the biggest oversights in the field. This lack of research has a double origin: (a) scarce longitudinal research designs, and (b) inappropriate theory of personality as essentially fixed trait predictors. The present study addressed this gap in the literature by testing the longitudinal and reciprocal relations between personality and occupational characteristics in a college alumni sample that was tracked over 15 years. Recent advances in the personality literature were used to develop an appropriate theoretical framework that allows for bidirectional effects. Our findings illustrate that personality predicts and is predicted by work environments, so to purport that the direction of influence from personality to work is only one way seems no longer valid. We believe that as empirical evidence regarding occupational socialization effects will start to accumulate, a further integration and refinement of various theoretical perspectives (e.g., Theory of Work Adjustment, Social Investment, sociogenic theory, Holland's secondary effects, Trait Activation Theory) will be possible, allowing a better understanding of how work influences personality, in addition to the more commonly studied trait validity effects.

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Tables

Table 1

Correlations between all observed study variables

	1	2	3	4	5	6	7	8	9	10	11
1. Neu T1	(.91)										
2. Ext T1	-.32 [†]	(.90)									
3. Ope T1	.20**	.15*	(.86)								
4. Agr T1	-.11	.04	.03	(.91)							
5. Cons T1	-.45 [†]	.17**	-.23 [†]	.09	(.90)						
6. Neu T2	.65 [†]	-.23**	.10	-.15*	-.26 [†]	(.92)					
7. Ext T2	-.24 [†]	.69 [†]	.12	.03	.03	-.34 [†]	(.90)				
8. Ope T2	.09	.07	.67 [†]	.01	-.19**	.12	.22**	(.88)			
9. Agr T2	-.06	-.07	.15*	.60 [†]	.05	-.16*	-.04	.20**	(.90)		
10. Cons T2	-.17*	.09	-.16*	.04	.48 [†]	-.36 [†]	.09	-.21**	.05	(.91)	
11. Rea T1	-.01	-.02	-.10	.05	.05	-.13	.02	-.03	.12	.10	(.90)
12. Inv T1	-.12	-.01	.07	-.22**	.17*	-.06	-.05	.01	.01	.13	.22**
13. Art T1	-.01	.07	.33 [†]	-.09	.01	.00	.09	.18*	.03	.10	-.05
14. Soc T1	.07	.21**	.10	.00	-.02	.03	.14	-.06	-.01	.05	-.01
15. Ent T1	-.18*	.39 [†]	.05	-.09	.18*	-.11	.21	-.14	-.20*	.16	-.02
16. Conv T1	-.08	.11	-.10	-.09	.07	-.11	.02	-.25**	-.17*	.12	.20**
17. Rea T2	-.11	-.05	-.12	.00	.04	-.07	-.01	-.05	-.02	-.06	.43 [†]
18. Inv T2	-.06	-.03	.10	-.05	.03	-.04	-.01	.06	.00	.12	.22**
19. Art T2	.09	-.01	.35 [†]	-.06	-.09	.11	.01	.30 [†]	.02	.08	-.07
20. Soc T2	.17**	.13*	.34 [†]	.13*	-.07	.09	.21**	.19**	.14*	.11	-.14
21. Ent T2	-.14*	.25 [†]	.08	-.16**	.09	-.06	.33 [†]	.01	-.32 [†]	.17*	.04
22. Conv T2	.04	.01	-.12*	-.03	.13*	.06	-.01	-.22**	-.10	.27 [†]	.05

Table 1 (Continued)

	12	13	14	15	16	17	18	19	20	21	22
12. Inv T1	(.91)										
13. Art T1	.29 [†]	(.89)									
14. Soc T1	-.03	.34 [†]	(.90)								
15. Ent T1	.13	.24**	.54 [†]	(.87)							
16. Conv T1	.10	.05	.45 [†]	.53 [†]	(.85)						
17. Rea T2	.24**	-.03	-.05	-.06	.18*	(.87)					
18. Inv T2	.49 [†]	.01	-.06	-.13	.01	.27 [†]	(.86)				
19. Art T2	.20**	.51 [†]	.10	-.06	-.06	.08	.35 [†]	(.91)			
20. Soc T2	-.05	.32 [†]	.31 [†]	.10	-.04	-.18**	.04	.38 [†]	(.86)		
21. Ent T2	.19*	.03	-.04	.23**	.10	.01	.20**	.25 [†]	.16*	(.88)	
22. Conv T2	.00	-.07	.02	.12	.29 [†]	.05	.04	-.10	.19**	.24 [†]	(.82)

Note. Neu = Neuroticism; Ext = Extraversion; Ope = Openness to experience; Agr = Agreeableness; Cons = Conscientiousness; Rea = Realistic; Inv = Investigative; Art = Artistic; Soc = Social; Ent = Enterprising; Conv = Conventional. T1 and T2 refer to Time 1 and Time 2 assessments respectively. Sample size varies between 147 and 266 due to missing values and study dropout. * $p < .05$; ** $p < .01$; † $p < .001$.

Table 2

Stability and change patterns in Big Five personality traits and RIASEC occupational characteristics

	Observed scores					Latent scores			
	Test-retest <i>r</i>	T1		T2		Mean change <i>d</i>	Fit <i>RMSEA</i>	Change-	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			Level <i>r</i>	Change <i>s</i> ²
Big Five traits									
Neuroticism	.65 [†]	2.82	.43	2.62	.41	-.48 [†]	.05	-.47 [†]	.10 [†]
Extraversion	.69 [†]	3.33	.43	3.29	.42	-.09	.08	-.39 [†]	.08 [†]
Openness	.67 [†]	3.60	.36	3.44	.40	-.42 [†]	.06	-.25 [*]	.06 [†]
Agreeableness	.60 [†]	3.42	.41	3.50	.34	.21 ^{**}	.07	-.61 [†]	.07 [†]
Conscientiousness	.48 [†]	3.47	.39	3.67	.35	.54 [†]	.07	-.60 [†]	.08 [†]
RIASEC characteristics									
Realistic	.43 [†]	0.44	.45	0.29	.35	-.39 [†]	.00	-.57 [†]	.13 [†]
Investigative	.49 [†]	1.27	.50	1.28	.40	.02	.07	-.62 [†]	.18 [†]
Artistic	.51 [†]	0.74	.45	0.71	.43	-.07	.01	-.47 [†]	.19 [†]
Social	.31 [†]	1.28	.46	1.46	.35	.46 [†]	.01	-.68 [†]	.22 [†]
Enterprising	.23 ^{**}	0.88	.43	1.18	.40	.75 [†]	.08	-.57 [†]	.19 [†]
Conventional	.29 [†]	1.18	.39	1.47	.32	.85 [†]	.06	-.65 [†]	.12 [†]

Note. Test-retest correlations and mean level changes are based on $N = 216$ for personality traits and $N = 179$ for RIASEC occupation scales. Latent change models are based on the entire sample ($N = 266$) using FIML. * $p < .05$; ** $p < .01$; † $p < .001$.

Table 3
Results from the multivariate Latent Change Models

Vocations	Neuroticism				Extraversion				Openness				Agreeableness				Conscientiousness			
	A	B ₁	B ₂	C	A	B ₁	B ₂	C	A	B ₁	B ₂	C	A	B ₁	B ₂	C	A	B ₁	B ₂	C
Realistic	-.06	-.03	-.20**	.12	.00	-.09	.05	.02	-.07	-.15*	.11	.09	.10	-.07	.16*	-.06	.00	.04	.17*	-.14
Investigative	-.10	.03	.00	-.02	-.05	-.02	-.04	.06	.04	.05	-.05	.06	-.26**	.09	.15*	-.01	.20**	-.05	.09	.04
Artistic	.01	.11	.04	.03	.04	-.06	.11	.00	.30 [†]	.22**	-.05	.19*	-.08	-.01	.04	.04	.01	-.09	.05	.09
Social	.09	.14*	-.03	.01	.24**	.06	.01	.17*	.14*	.28 [†]	-.07	-.02	.07	.12*	-.09	.09	-.07	-.04	.00	.10
Enterprising	-.17*	-.04	-.01	-.05	.39 [†]	.08	-.05	.20**	-.02	.04	-.19*	.08	-.14*	-.12*	-.21**	-.14*	.17*	.04	.03	.15*
Conventional	-.05	.12*	-.05	.03	.13	-.04	-.06	.01	-.14*	-.07	-.14*	-.07	-.06	.01	-.22**	-.02	.02	.07	.06	.12

Note. A = Correlation between latent personality level and latent occupation level (i.e. Selection effects); B₁ = Personality trait levels predicting RIASEC occupation changes (i.e. Activity effects); B₂ = RIASEC occupation levels predicting personality trait changes (i.e. Reactivity effects); C = Correlations between changes in traits and changes in occupational characteristics (i.e. Correlated change). *N* = 266 (FIML). * *p* < .05; ** *p* < .01; [†] *p* < .001.

Figures

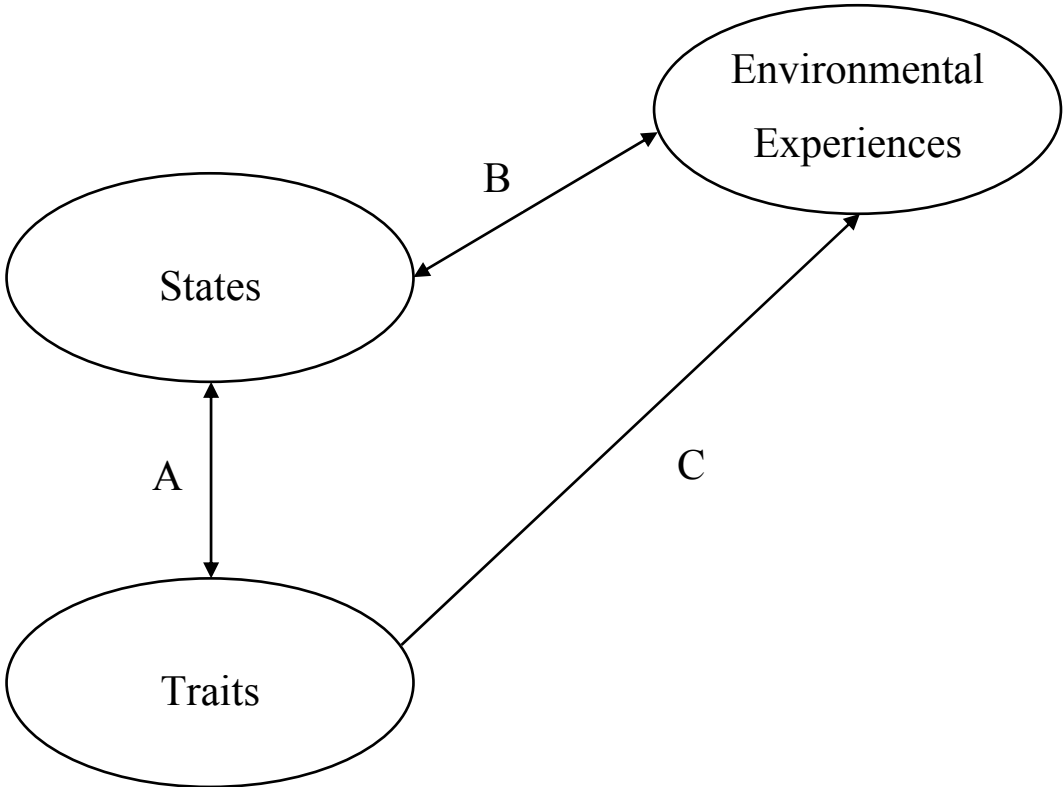


Figure 1. Sociogenomic model of personality traits that illustrates how environmental experiences might influence trait change.

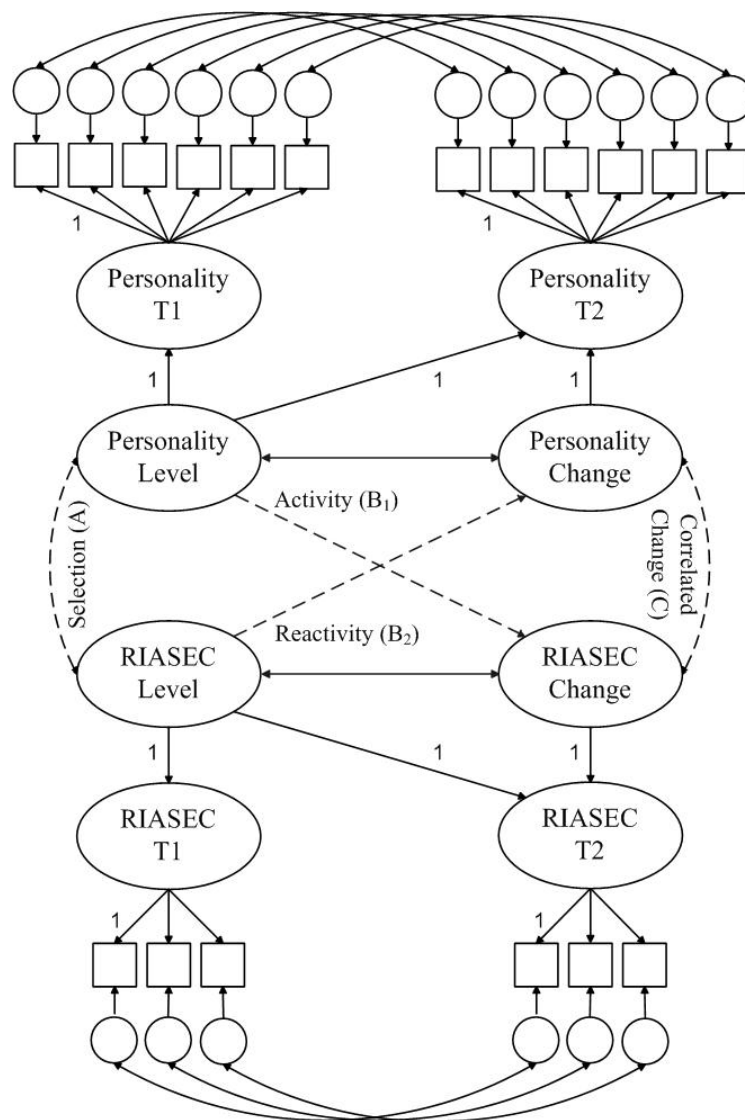


Figure 2. A schematic representation of the central research questions (dotted lines in the middle part) and the structural equation models that were constructed to test these. Changes in Big Five personality traits and RIASEC occupational characteristics were modeled using standard Latent Change Models in which factor loadings for the observed indicator scales (RIASEC item parcels and FFM personality facets) were constrained equal over time.

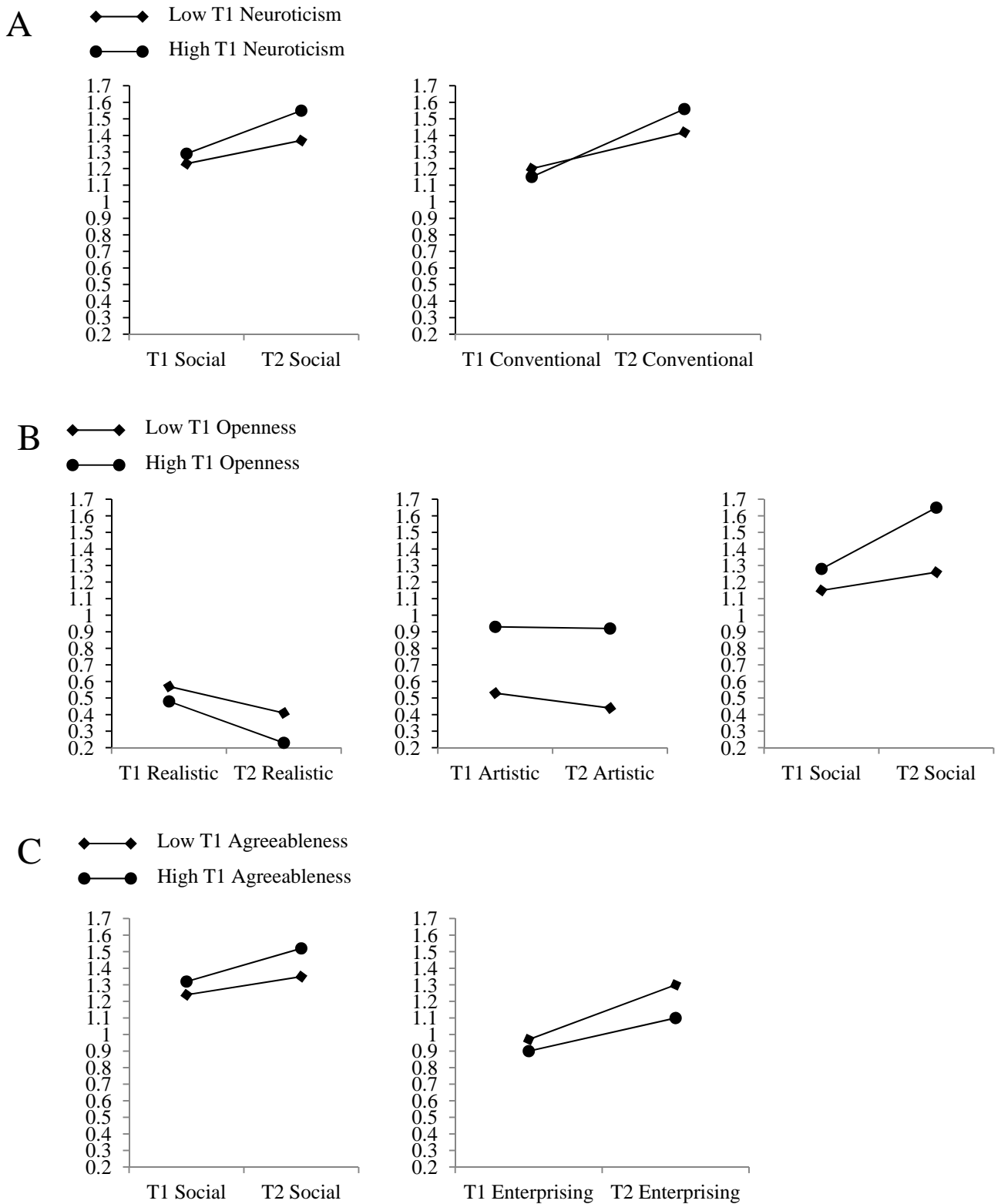


Figure 3. Activity effects of T1 Neuroticism (Panel A), T1 Openness (Panel B), and T1 Agreeableness (Panel C) on subsequent change in vocational characteristics. Observed change patterns are reported for first quartile (i.e. Low scorers) and fourth quartile (i.e. High scorers) individuals selected from T1 personality distributions.

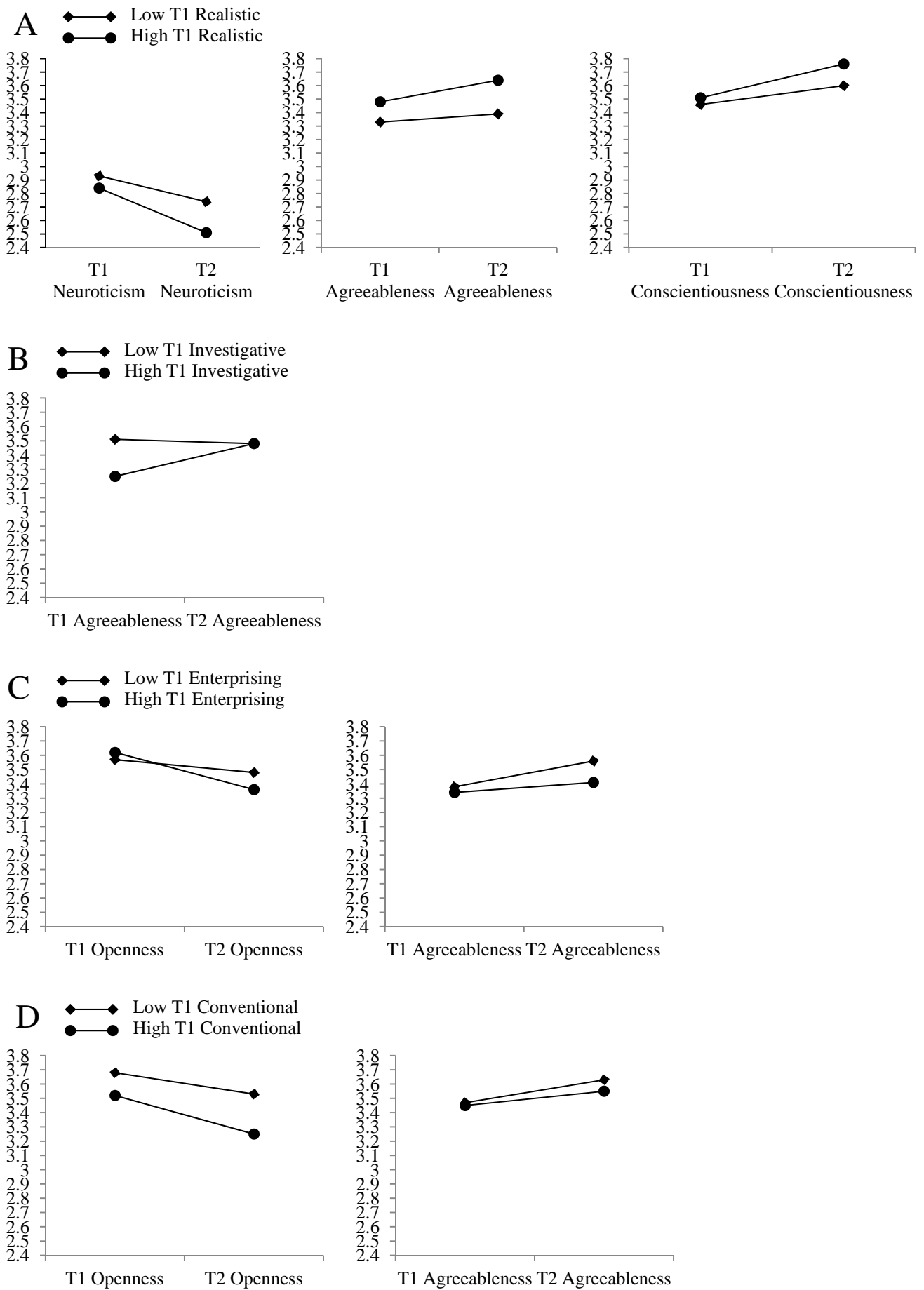


Figure 4. Reactivity effects of T1 Realistic (Panel A), T1 Investigative (Panel B), T1 Enterprising (Panel C), and T1 Conventional (Panel D) vocational characteristics on subsequent change in personality traits. Observed change patterns are reported for first quartile (i.e. Low scorers) and fourth quartile (i.e. High scorers) individuals selected from T1 vocational characteristics distributions.

Chapter 8

General discussion

This final chapter recapitulates and integrates the main findings obtained in the different studies, documenting the relevance of a reciprocal approach to personality and career advancement. Furthermore, we outline the main theoretical implications of such an approach for personality research in OB, followed by a discussion of the practical implications for personality assessment in organizational contexts. At the end of this chapter, some limitations and promising directions for future research are also delineated.

Research Overview

This dissertation set out to investigate a reciprocal approach to personality and career advancement, and three main research objectives were outlined for this purpose. First, we wanted to re-establish the associations between personality and important career outcomes using a more powerful long-term prospective design. Second, we argued for a dynamic conceptualization of career advancement as a process that unfolds over time, and tried to adopt this perspective in our studies where possible. Finally, we aimed to extend previous personality research in OB by investigating bidirectional associations in addition to the more commonly studied unidirectional associations between personality and aspects of career advancement. Below, we take a closer look at how these objectives were realized in the present dissertation, and what were the major findings resulting from this line of research.

Long-Term Prospective Effects

The first three chapters in this dissertation focused on the long-term prospective effects of personality traits for various outcomes, covering a broad range of criteria that constitute career success. Together, these studies provided further support for an individual difference perspective on career success, adopting a powerful long-term prospective design that spanned a substantial and significant period in people's professional lives, namely the first 15 years of the professional career.

Chapter 1 focused on extrinsic career success and outlined three specific objectives: (1) replicating personality-success associations using a longitudinal research design, (2) expanding the individual difference approach to extrinsic career success by considering enterprising interests as an additional person-level predictor, and (3) further illuminating the road to success by exploring whether and how these interests mediate trait-success associations. The results first revealed three FFM traits to be particularly relevant for extrinsic success attainment: Extraversion (positive effect), Conscientiousness (positive effect), and Agreeableness (negative effect). Extraversion predicted both managerial level and income, whereas the effects of Agreeableness and Conscientiousness

were restrained to financial success. Interestingly, enterprising career interests added significantly to the prediction of these success criteria over and above FFM traits, and at least partially mediated trait-success associations. It especially seems that extraverts' higher hierarchical and financial attainment is largely driven by aspirations to dominate the work environment and an urge for status-related rewards (full mediation effect), as suggested by Bozionelos (2004). Further, these mediation effects also provided an interesting perspective on the effect of Agreeableness on extrinsic success, which is still poorly understood in the literature. Previously, researchers (e.g., Bozionelos, 2004; Seibert & Kraimer, 2001) have tried to explain such effects by referring to a tendency of agreeable people to help and care about others and therefore putting their own career interests aside. These findings, however, cautiously paint another picture and suggest that highly agreeable people rather do not share the same career interests as individuals scoring lower on this trait, and particularly differ in those interests that are beneficial for obtaining financial and/or hierarchical success.

Chapter 2 extended this long-term prediction focus by shifting the attention from extrinsic to intrinsic or subjective indicators of career success. We specifically argued that perceptions of employability and work-family conflict are important and relevant work outcomes in contemporary careers, and responded to recent calls (e.g., Judge & Kammeyer-Mueller, 2007) to integrate these into the study of career success. Overall, the longitudinal analyses further substantiated the dispositional source of intrinsic career success, by showing that both outcomes were significantly predicted by at least one FFM trait. For intrinsic success, Neuroticism in particular was revealed as the strongest trait predictor, significantly worsening the perceptions of both work-family conflict and employability. In addition, we also found baseline levels of Agreeableness and Conscientiousness to influence subsequent intrinsic career success, at least in terms of work-family balance. Individuals higher on Agreeableness at the beginning of the career developed more positive perceptions of work-family balance, possibly reflecting the availability of stronger social support networks (Michel, Clark, & Jaramillo, 2011; Wayne, Musisca, & Fleeson, 2004). Rather unexpectedly, baseline levels of Conscientiousness predicted more negative

perceptions of work-family conflict, while it has previously been suggested that characteristics like being purposeful, punctual and organized are supposed to make individuals more effective at managing their time, tasks, and conflicts that arise between work and home domains (Bruck & Allen, 2003; Wayne et al., 2004). In this regard, inspection of the facet level associations provided an interesting possibility to better understand these long-term trait effects. For Conscientiousness and work-family conflict in particular, these more fine-grained analyses revealed that this effect seems to reflect a higher level of achievement striving in highly conscientious individuals at the beginning of their career.

Finally, integrating the findings from Chapter 1 and 2 regarding long-term prospective trait effects further underscores the distinctiveness of both conceptualizations of career success (extrinsic versus intrinsic), and indicates that traits may differentially impact on these outcomes. While highly conscientious individuals, driven by achievement striving and goal persistence (see also Chapter 1), succeed in attaining higher financial success, this seems to be at the expense of a successful work-family combination. A comparison of the long-term dispositional effects on both categories of outcomes is provided in Table 1.

Chapter 3 took an alternative approach in examining the dispositional source of career success by considering an additional set of six aberrant personality tendencies as potential trait predictors. This study was the first to introduce the dimensional thinking on personality dysfunction into the OB literature, and to extensively test the validity of FFM aberrant personality tendencies to predict a broad range of career outcomes. Using a combination of techniques, we were able to demonstrate that these subclinical tendencies are indeed relevant for both extrinsic and intrinsic outcomes, even when FFM general traits are simultaneously taken into account. We were especially intrigued to find that aberrant tendencies outside the scope of the more commonly studied dark triad (i.e. Narcissism, Psychopathy, and Machiavellianism), such as the avoidant tendency, significantly contributed to the long-term prediction of important criteria like the establishment of financial

success. Recall that both the FFM aberrant compounds and the FFM general traits are different linear combinations of the same set of 30 FFM facets. The fact that FFM aberrant tendencies demonstrated incremental long-term validity beyond the grouping of facets into FFM general domains further speaks for their significance as useful psychological constructs, similar to other compound traits used in OB, such as integrity (Ones, Viswesvaran, & Schmidt, 1993), customer service orientation (Frei & McDaniel, 1998), employee reliability (Hogan & Hogan, 1989), and managerial potential (Gough, 1984). The joint relative weight analyses of FFM general and FFM aberrant traits moreover indicated that both are important to adequately understand career success from a dispositional perspective.

Dynamic Criteria

Chapters 4, 5, 6, and 7 have in common that they address the validity of FFM general traits to predict aspects of career advancement from a more dynamic perspective, focusing on indicators of flux or change in career experiences over time. Although there is now increasing attention in the organizational literature for trajectories of job performance (Minbashian, Earle, & Bright, in press; Thoresen, Bradley, Bliese, & Thoresen, 2004), such a perspective is still underdeveloped in the careers literature (Hoekstra, 2011). A notable exception is the study by Judge, Klinger, and Simon (2010) who showed that over a 28-year period, General Mental Ability (GMA) affected growth in two indicators of extrinsic career success (income and occupational prestige), such that the careers of high GMA-people ascended more steeply over time than those for low GMA-individuals. In the present dissertation, we investigated how FFM general traits influenced various indicators of career advancement, including changes in work-related attitudes (Chapter 4), job transitions (Chapter 5), and changes in work role content (Chapter 6) and occupational characteristics (Chapter 7) over the first 15-year career half. An overview of these findings is presented in Table 2.

Chapter 4 specifically focused on the associations between personality traits and changes in two of the most frequently studied work-related attitudes,

namely satisfaction and involvement. Although there is a substantial body of research now showing that attitudes, including the ones considered here, have a substantial dispositional basis (Bowling, Beehr, & Lepisto, 2006; Bruk-Lee, Khoury, Nixon, Goh, & Spector, 2009; Judge, Heller, & Mount, 2002), studies examining dispositional effects on long-term changes in these attitudes are lacking. Regarding change in job satisfaction, we found positive effects of initial levels of Extraversion and Agreeableness, and a negative effect of Neuroticism. These findings fit earlier theorizing about the role that employee dispositions play in the development of work attitudes. Specifically, individuals with pleasant dispositions are expected to seek out, evoke, be sensitive to, and remember the positive aspects of their work environment (Bowling et al., 2006). Regarding work involvement, the results indicated that individuals high on Openness, who are characterized by broad interests, also outside the work domain, have smaller increases in work involvement compared to people initially low on Openness. Further, it was found that highly agreeable individuals, who tend to prioritize relationships with others over attaining work and career success (Judge, Higgins, Thoresen, & Barrick, 1999), also demonstrated smaller increases in work involvement over time.

In addition to these prospective effects of initial trait levels, it was also examined whether and how changes in traits were associated with concurrent changes in attitudes (i.e. patterns of correlated change). In this regard, this study was the first to empirically demonstrate that within-individual changes in attitudes are -at least partially- driven by changes in underlying dispositions, a mechanism we called maturation of work attitudes. At least for job satisfaction, our findings provided substantial evidence for correlated change with FFM traits. As individuals became more optimistic and emotionally stable (increases in Extraversion and decreases in Neuroticism) and acquired a more responsible and reliable mind set (increases in Conscientiousness), they simultaneously increased in job satisfaction. Changes in work involvement, on the other hand, were inversely related to changes in Agreeableness. This finding was framed in the theory on functional maturity (Hogan & Roberts, 2004), and illustrates that

as individuals evolve from a competitive to a more accommodating interpersonal mindset, work also becomes less preoccupying in their lives.

In Chapter 5, we moved away from changes in attitudes concerning work and instead shifted our attention to the validity of personality to predict actual job moves over time. For this purpose, we introduced the concept of job instability, which was operationalized in this study as the aggregate of three different types of moving behaviors: (1) moving to a different job within the same company, (2) moving to the same type of job in a different organization, and (3) moving to a different type of job in a different organization. In addition, we also differentiated between internal and external mobility. The results indicated that two FFM general traits were particularly relevant for predicting the frequency of job movements: Agreeableness and Openness to Experience. Consistent with our expectations, we first found individuals scoring low on Agreeableness to change employers more frequently, a finding that can be understood from different perspectives. From an employee's perspective, it was argued that individuals scoring high on Agreeableness are perhaps more sensitive to the uncomfortable interpersonal consequences associated with voluntary organization switching, resulting in less external mobility. From an employer's perspective, it can be argued that employees scoring higher on Agreeableness have more chance of being retained in an organization because of their valuable interpersonal qualities and positive contributions to team performance (Peeters, Van Tuijl, Rutte, & Reymen, 2006). Second, a positive effect was found for Openness to experience on the frequency of external job mobility, confirming that individuals scoring high on Openness are more change-oriented (John & Srivastava, 1999), and, on average, have a greater propensity to switch employers (Vinson, Connelly, & Ones, 2007). Finally, an exploration of facet level associations between personality traits and the frequency of job changes provided some initial evidence that some Big Five traits are perhaps too broad to significantly explain job change behavior. To give one example, we can refer to the positive effect of E5: Excitement seeking on internal mobility, which seemed to fade away at the domain level.

Of course, this frequency of job changes only gives a rudimentary view on people's career transitions. In order to further clarify these trajectories, in Chapter 6 we focused on career content and how this evolves during this 15-year period of time. We used Hoekstra's (2011) Career Roles Model (CRM) to track individuals' career advancement in terms of six underlying roles (i.e. Maker, Expert, Presenter, Guide, Director, and Inspirator). One particular advantage of applying the CRM for this purpose is that it is grounded in theory on development, and, moreover, that the individual is supposed to occupy a central role in shaping his/her career. Regarding the long-term prospective effects of initial personality trait levels on subsequent change in career role engagement, we specifically expected individuals to further develop those roles that they initially preferred and selected based on their baseline personality characteristics. Although several significant prospective effects were found (see Table 2 for a summary), evidence for trait effects on role change was generally modest, and the effects largely did not correspond with this developmental hypothesis. We argued that these findings challenge the idea that individuals selectively *strengthen* those aspects of the work role that are compatible with their personal characteristics. Instead, it seems that individuals are more motivated to *maintain* a satisfying role position over time rather than striving for *disproportionate increases* in desired roles.

Although the operationalization of career advancement in Chapter 6 had the advantage that role trajectories were mapped using information from seven time points, a noteworthy limitation was that these trajectories were reconstructed retrospectively. In Chapter 7, a prospective design was therefore adopted to inspect changes in occupational characteristics using Holland's RIASEC typology of work environments as a guiding framework. This Holland model has the major advantages that it is well-established in the careers literature (Nauta, 2010), and that associations between personality and the selection of these work environments have been demonstrated before (De Fruyt & Mervielde, 1999; Judge et al., 1999; Woods & Hampson, 2010). Chapter 7 expanded this literature by focusing on how traits influence changes in occupational characteristics, after initial selection has occurred. In this regard,

this study sheds a new light on occupational gravitation, which has previously been addressed in an overly static manner. Similar as in Chapter 6, we expected these changes, which we labeled *activity effects* (Dawis & Lofquist, 1984), to be connected with the initial selection effects in such ways that people were expected to selectively strengthen those occupational characteristics that were preferred and selected at the career start. Again, the findings only provided modest support for this developmental hypothesis, as only three out of the ten selection effects were also reflected in the activity effects. Openness was positively associated with initial levels of Artistic and Social characteristics, as well as with changes in both occupational characteristics. Similarly, individuals higher on Agreeableness not only occupied less Enterprising occupations at the career start, but they also showed smaller increases in these Enterprising characteristics over the next 15 years. In addition, four activity effects were also identified that were not unprecedented by significant selection effects, although these were well interpretable. Over time, individuals higher on Neuroticism seek comfort in stronger Social environments where the focus is on cooperation rather than competition, and increasingly seek out the reassuring security and predictability that is characteristic for Conventional environments (Holland, 1997). Similarly, individuals higher on Agreeableness further craft their careers in a Social direction at the expense of Enterprising characteristics. Finally, individuals higher on Openness, who are characterized by broad-mindedness, increasingly turn away from occupations with stronger Realistic characteristics, which stimulate inflexible, conforming, and dogmatic thinking (Holland, 1997). It was concluded that findings such as these illustrate the difference between occupational selection (i.e. the short-term effects of traits on occupational characteristics) and occupational gravitation (i.e. the long-term dynamic effects), and point out *active adjustment* (Dawis & Lofquist, 1984) as a missing link between both.

Reciprocal Relations

The third main objective in this dissertation consisted of gathering evidence for reciprocal relations between personality and work, with traits

shaping our work experiences and vice versa. The findings presented in Chapters 4, 6, and 7 substantiated such bidirectional perspective.

Although the focus in Chapter 4 was on testing whether changes in attitudes could be explained from a dispositional perspective, we simultaneously found evidence for reverse effects, from work-related attitudes on change in personality traits. The findings specifically indicated that initial levels of job satisfaction early in the career were predictive for greater increases in Agreeableness over the course of the next 15 years. This effect was interpreted in the context of a social investment perspective on personality development (Lodi-Smith & Roberts, 2007), which stipulates that the establishment of a successful and satisfying career is one of the driving forces behind normative personality development. More precisely, this finding highlights the importance of a good career start for future personal development.

In Chapter 6 we shifted our attention from work-related attitudes to the associations between work role characteristics and patterns of personality trait change. This study was introduced as one of the first in the literature to adopt a transactional approach to Person – Environment fit, whereby people and environments change continually in ongoing adjustment. We found Hoekstra's (2011) model of career role identities particularly appealing for this purpose, because it has previously been argued that role identities may offer a way to understand how life experiences, including those at work, and general personality traits interact over time (Roberts & Wood, 2006). Consistent with previous research on personality development and life experiences (e.g., Roberts & Bogg, 2004; Roberts, Caspi, & Moffitt, 2003), we expected the traits that 'selected' people into specific career roles to be the same traits to change in response to those same career roles. Although our findings indeed provided evidence for patterns of correlated change, these generally failed to follow the hypothesized corresponsive principle. As indicated in Table 3, change in career role engagement was associated with change in four of the five personality traits; only for Openness, no significant associations were found between trait change and change in career role engagement. These results importantly indicated that increases in career role engagement generally promoted normative

personality trait changes. For example, normative decreases in Neuroticism were more pronounced in individuals showing greater increases in Director, Presenter, and Inspirator roles. Similarly, normative increases in Conscientiousness were more pronounced in individuals showing greater increases in Director, Inspirator, Guide, and Expert roles. However, the findings also pointed out that investment in certain aspects of the work role can contribute to non-normative trait change. Specifically, we found that greater increases in Director and Inspirator roles during the first career stage were inversely associated with changes in Agreeableness. Apparently, these two career roles impose certain behaviors or tendencies to people that buffered or hindered the naturally expected growth in Agreeableness. It was therefore concluded that this study, for the first time, suggested that stronger work role involvement not necessarily contributes to normative personality development, but that the effects may depend on specific work role content.

This general hypothesis was further tested in Chapter 7, where patterns of personality trait change were related to occupational characteristics operationalized in terms of Holland's well-established RIASEC framework. The major advantage of using this taxonomy of occupational characteristics for this purpose is that clear expectations can be formulated regarding the usefulness of separate personality traits for effective functioning in each of these six theoretical vocation types. The strongest evidence for reciprocal effects was obtained by examining the *reactivity effects* (Dawis & Lofquist, 1984) in the multivariate latent change models, which represented the prospective effects of baseline occupational characteristics on subsequent changes in personality traits. Again, we expected these reactivity effects to be linked with initial selection effects, such as prescribed by the corresponive principle. That is, traits that got people selected into certain occupational environments were expected to change under the influence of these same occupational characteristics in such a way that these traits are further deepened. As summarized in Table 3, substantial evidence was found for reactivity effects, with baseline occupational characteristics predicting changes in all traits with the exception of Extraversion. Individuals in initially stronger Realistic occupations had greater decreases in

Neuroticism, while at the same time increased more steeply in Agreeableness and Conscientiousness over the next 15 years. Further, individuals in initially stronger Investigative occupations demonstrated greater increases in Agreeableness compared to those in less prominent Investigative occupations at Time 1. Finally, it was found that individuals in initially stronger Enterprising and/or Conventional occupations demonstrated greater decreases in Openness and smaller increases in Agreeableness. Despite this substantive evidence that occupational characteristics predicted changes in personality traits, these reactivity effects largely failed to be in accordance with the hypothesized corresponive principle. In fact, of the eight reactivity effects that were observed, only the effects of Conventional characteristics (on change in Openness) and Enterprising characteristics (on change in Agreeableness) were corresponive with the occupational selection effects observed at the career start. Also keeping in mind the findings reported in Chapter 6 on personality and career role development, it can be concluded that there is indeed evidence for reciprocity between personality and career advancement, but that these precise mechanisms are probably more complex than originally thought.

Finally, it is stressed that cautiousness is warranted when trying to integrate the findings on reciprocity between personality and career advancement reported in Chapters 6 and 7. Although these studies are clearly connected, there are at least three important methodological differences that make it difficult to directly compare their respective results. As already indicated, first it is important to keep in mind that work role trajectories were reconstructed retrospectively in Chapter 6, while a prospective design was used to evaluate changes in occupational characteristics in Chapter 7. Although we argued that the interactive web application that we used for Chapter 6 maximally allowed participants to give reliable and valid descriptions of their career role development, it can not be ruled out that such retrospective evaluations may be partially biased or inaccurate. Second, and related, the effects that are portrayed in Table 3 for both chapters should be approached with caution because they represent different types of parameters from our statistical models. For Chapter 6, these effects represent correlations between changes in work role engagement

and changes in personality traits; for Chapter 7, these represent the prospective effects of initial occupational characteristics (i.e. RIASEC levels) on subsequent changes in personality traits. Finally, when comparing both taxonomies of work experiences (i.e. the CRM and the RIASEC model), it is important to keep in mind that both models operate at a different level. While the Holland model aims to differentiate between types of vocations in terms of the prevailing occupational characteristics, the CRM focuses on the roles one occupies in his/her job, independent from vocational type. To date, it remains an open question how these different models are related and how they can be best integrated to more fully understand the process of career development in all its complexity. Despite this lack of direct comparability, it can be considered a strength of the present dissertation that attempts have been made to address this issue of reciprocity from various angles and using different methodologies. At the same time, this is a call for future researchers to try to replicate some of our findings, using even more sophisticated research designs that allow a further understanding of the role that work plays in aspects of personality trait change.

Research Implications

In this dissertation, seven empirical chapters were presented that were each framed in a specific sub domain of organizational behavior and/or career psychology. These chapters covered a broad range of topics, including career success, person-environment fit, career development, occupational socialization, and (aberrant) personality assessment. Instead of recapitulating the diverse contributions of each of these chapters for these specific literatures, this general discussion will focus on the empirical, theoretical, and applied implications of the overarching reciprocal model of personality and career advancement, which constituted the general objective of the present dissertation.

Empirical Contributions

The idea of reciprocity between personality and work has already been proposed earlier in different disciplines of psychology and beyond. In the personality literature, there is now increasing attention for personality development and life experiences in general (Roberts & Wood, 2006), and the

corresponsive principle (Roberts et al., 2003) is the theoretical mechanism most frequently used to guide this line of research. Sociology was probably the first discipline to discuss personality changes in organizational contexts (Frese, 1982), and defined occupational socialization as changes in the person which take place in and because of the work situation (Volpert, 1975). Finally, in his theory on vocational environments and personalities, Holland (1985, 1997) also outlines ‘secondary effects’, referring to changes in those personality traits that got people selected into certain occupational environments in the first place.

In spite of these theoretically attractive perspectives, to date very little is known about the precise role that work plays in changes of personality (Judge, Klinger, Simon, & Yang, 2008). By approaching the association between personality and various aspects of work life from a longitudinal bidirectional rather than from a unidirectional perspective, the present dissertation succeeded in putting these theoretical perspectives to an empirical test.

Perhaps the most important empirical contribution of the present work is the fact that relatively strong evidence could be provided for reciprocity between personality and work, showing that this is indeed a promising field of research, also for OB researchers who have long been interested in unidirectional effects only. Moreover, as will be discussed below, a replication of our findings concerning reciprocity and further extension of this line of research should have the potential to (a) substantially change the way personality is theoretically approached in OB, and (b) to open the door for a new set of practical interventions focused around personality development.

Theoretical Contributions

Dispositional theories in OB typically characterize personality as stable patterns of cognition, affect, and behavior that are consistent across contexts, heritable, functionally unchanging, and causal (e.g., McCrae & Costa, 2008). This traditional conceptualization of traits as predictor variables that are essentially fixed has greatly served applied psychologists mainly interested in the validity of traits to predict various organizational and career outcomes. To date, this version of personality psychology proves to be overly static, given that

considerable evidence now suggests that personality traits may be dynamic and shift along developmental trajectories (Jackson, Hill, & Roberts, 2010; Johnson, Hicks, McGue, & Iacono, 2007; Roberts, Walton, & Viechtbauer, 2006). Moreover, there is increasing research showing that life experiences, including those at work, can play a significant role in patterns of personality development (e.g., Bleidorn, *in press*; Hudson, Roberts, & Lodi-Smith, 2012; Roberts et al., 2003; Wille, Beyers, & De Fruyt, *in press*). In this regard, trait models that do not incorporate the transactions between personality and situation fail to account for conceptual and empirical findings of personality development (Fraley & Roberts, 2005). It can therefore be argued that a reconceptualisation of personality in OB seems warranted.

One view that may be particularly relevant in this regard has recently been introduced in the developmental literature and conceptualizes personality traits as relatively enduring, automatic patterns of thoughts, feelings, and behaviors that differentiate people from one another and that are elicited in trait-evoking situations (e.g., see also the sociogenomic model of personality; Roberts, 2009; Roberts & Jackson, 2008); that is, personality is conceptualized to reflect the often nonconscious, reflexive ways in which people respond to stimuli in their environment (Magidson, Roberts, Collado-Rodriguez, & Lejuez, *in press*). Furthermore, in this view, personality not only exists at a trait level, which reflects the relatively enduring signature of traits, but also at the state level, which reflects moment-to-moment fluctuations in functioning (Fleeson, 2001). Although evidence indicates that states are partially a reflection of traits (Nezlek, 2007), state-level variation also suggests the possibility that variation in thoughts, feelings, and behavior may occur for other reasons, and can be shaped by environmental contingencies (Roberts, 2009). As such, contingencies may be used to shape states, which in turn may shape traits in a bottom-up fashion (see also the implications for practice discussed below).

Besides providing further support for such an alternative, reciprocal approach to personality and work, the present dissertation also tried to clarify some of the theoretical mechanisms underlying such reciprocal effects. In Chapter 6, for instance, the idea was discussed of a growing career identity as a

mediating mechanism between work role experiences and personal identity development. Hoekstra (2011) approaches career development as a continuous process of identity development in the work context, with individuals gradually internalizing a personalized set of career roles that one identifies with and is identified with. As argued by Wood and Roberts (2006), roles have many properties that make them suitable for integration with trait models. For instance, acting in the role of a manager at work is manifested in most interactions with subordinates, such as leading meetings, providing feedback, and communicating plans and ideas. Thus, in some way the roles individuals enact are comparable to general personality traits (e.g., the Big Five) in that they represent higher-order aggregations of more molecular situations (Hull, 2002). Further, there are also considerable individual differences in how roles are enacted, and the particular manner in which people enact and experience roles also shows a marked degree of stability over time (e.g., Robins, Caspi, & Moffitt, 2002; Wille, Beyers, et al., in press). Taken together, these role characteristics make role identities, including how one sees oneself as a worker, to be one of the more promising avenues to understand reciprocity between personality and work.

In Chapter 7, we further elaborated on this reciprocal approach by illustrating at a more micro level how specific characteristics of the work environment may shape personality trait change. Drawing on the sociogenomic model of personality (Roberts & Jackson, 2008), we further developed the idea that specific role demands, for instance in the Enterprising work environment, create a reward structure that promotes self-regulated and consistent changes in behavior that, if extended, may cause changes in traits through a bottom-up process. A key aspect in this theoretical mechanism concerns the distinction between state and trait-level manifestations of traits, and the associations between both. Although research in organizational contexts acknowledges the effects that work characteristics have on fluctuations in personality states (e.g., moods; Jones, O'Connor, Conner, McMillan, & Ferguson, 2007), the idea that, over time, pervasive personality states might also pervade at the trait-level has not sufficiently been considered. We believe that such a sociogenomic view on

personality, with transactions between traits, states, and situations, may significantly contribute to a more complete understanding of personality functioning at work.

Does this alternative conceptualization of personality in OB mean that we need to entirely reconsider the stability of traits? By far not. The single best defining characteristic of personality development in adulthood is still ‘relative stability’, indicating the high degree of consistency in the rank-ordering of individuals over time on a given trait (Roberts & Wood, 2006). Moreover, one of the most striking features of longitudinal studies tracking the relation between life experiences and personality change is the relatively small effect that environmental contingencies have on personality change (see also Roberts, 1997; Roberts et al., 2003; Roberts & Chapman, 2000; Roberts, Helson, & Kohnen, 2002). Despite sometimes robust shifts in environments, people generally do not demonstrate dramatic changes in terms of personality traits in response. However, the fact that research, including the studies presented in the present dissertation, repeatedly *do* show such associations makes this issue of reciprocity all the more intriguing. Moreover, it was demonstrated that there are vocation- or occupation-specific effects on individual’s personality development. So, although it is unlikely to expect dramatic personality trait change, the literature today suggests normative *and* individual personality changes, challenging the assumption of constructs that are not malleable or insensitive to change. Investment in the worker role is one of the central mechanisms to explain normative changes according to the social investment theory (Lodi-Smith & Roberts, 2007), whereas specific work experiences or elements from the work environment further impact on individual personality development trajectories. The implications of such findings are that personality theories will have to incorporate both stability, but also normative and individual changes, giving work experiences a key position in explaining individual developmental trajectories. Keeping track of these trajectories is important, as even small changes in any of the Big Five personality traits are associated with widespread impacts across different life domains (Ozer & Benet-Martinez, 2006).

A reciprocal view on personality and work further has important implications for various theoretical frameworks that currently have a central position in personality research in organizational contexts. For instance, in the well-established model of personality and career success by Judge and Kammeyer-Mueller (2007), all associations between personality traits, work behavior, and career outcomes are specified in a unidirectional manner, from personality traits to success attainment. In light of the recent conceptual and empirical advances on personality trait change discussed above, this model now seems too simplistic. Sutin and Costa (2009), for instance, demonstrated that income level, which is a commonly used indicator of extrinsic career success, predicted decreases in Neuroticism over the course of the next 10 years. Clearly, models of personality and career success need to acknowledge some form of reciprocity in the associations that they specify.

As another example, Trait Activation Theory (TAT; Tett & Burnett, 2003) is currently the most widely accepted person-situation interactionist model of job performance that specifies the conditions under which particular personality traits will predict effective functioning in a given work environment. In light of the findings presented in this dissertation (see especially Chapter 7), a reformulation of TAT would allow for a more complete and up-to-date understanding of personality functioning at work. Specifically, what seems to be missing in this model is a bidirectional association between personality and work behavior, whereby repeated activation of certain traits that are favorably evaluated in a certain work environment, could, over time, result in a further development of these traits. All together, it can therefore be concluded that as evidence regarding the reciprocity of personality and work will accumulate, these and other prominent models of how personality plays a role in organizational contexts will have to be revised in order to more fully take into account the dynamic transactions that take place.

Finally, in addition to using recent advances from the personality development literature to reconceptualize personality theory in OB, the findings in the present dissertation may also further personality psychologists' understanding of how work may influence trait development. The results indeed

supported the idea that investment in the work role may serve to further develop those traits that are accommodating for effective functioning at work (Hudson et al., 2012), but at the same time illustrate that this effect of work role investment on personality development also depends on the specific characteristics or role requirements the worker is confronted and identified with. This further means that in some work contexts, the effects of work role engagement on personality change may be to stimulate normative changes in certain traits, while at the same time buffering normative changes in other traits. It is therefore concluded that a more complete understanding of how work influences personality development is only possible when specific characteristics of the work environment (e.g., in terms of underlying roles or prevailing occupational characteristics) are also taken into account. This is an aspect that, until now, has remained severely underaddressed in the empirical and conceptual personality development literature.

Applied Contributions

OB researchers have long been interested in the predictive validity of traits for various work outcomes because of the implications that such findings have for employee screening and selection practice. The present dissertation further substantiated these applied implications of personality testing, for instance by uncovering the dispositional risk factors that contribute to negative work-life balance (see Chapter 2), or by providing evidence for the long-term predictive validity of aberrant personality tendencies to predict a broad range of career outcomes (see Chapter 3). However, besides selection, personality assessments in organizational contexts are also frequently used for employee development or coaching purposes (De Fruyt et al., 2009). In this regard, the evidence provided in this dissertation for a reciprocal view on personality and work further underlines the malleability of traits, and opens the door for a new set of interventions aimed at cultivating people's personal dispositions (see also Wu & Griffin, 2012). Because this is still an under developed area of applied personality psychology in organizational contexts, three fundamental questions

are addressed here with the purpose of stimulating new advances in personality development practice.

Is personality change desirable? Research has now demonstrated that personality is related to a broad range of organizationally relevant criteria, and selecting people on the basis of ‘favorable traits’ is an important but insufficient instrument to manage employee’s talents, competencies, or skills sets. For various reasons, people that have been selected may, over time, demonstrate certain tendencies that may be impeding for their own functioning at work, for their co-workers’ functioning, or with respect to potential career growth opportunities in the company. In such and other cases, *employee coaching* can be a valuable solution, aimed to alter an isolated or more generalized pervasive pattern of behavior. The thorny issue of change is usually approached by proposing behavioral change, thereby sidestepping the question of personality change because traits are assumed to be stable over time. However, if there are real developmental influences on traits from work experiences, than it may logically follow that people can, if they wish, change aspects of their personality based on exposure to new kinds of activity and environments, reinforcement, and practice. Such change may be more than simple behavior change, but rather influence sense of identity at its core, and perceptions of one’s own traits. This brings u to the second question.

Is personality change through intervention possible? To date, various studies have supported the possibility to change personality traits through intervention in settings outside the organizational context. As a key example, a 20-week cognitive behavior therapy intervention aimed to treat depression was associated with changes in a number of personality traits, most notably in extraversion and neuroticism (Clark et al., 2003). Outside the clinical context, a more recent study demonstrated that training medical students in mindfulness resulted in changes in the traits of conscientiousness, agreeableness, empathy, and emotional stability (Krasner et al., 2009). Finally, as significant changes in traits have been demonstrated during a 12 week intervention in clients with extreme personality dysfunction (Maddux et al., 2009), it does not seem

unrealistic to explore trait change in organizational coaching populations that do not suffer from major psychopathology.

How to set up interventions in organizational settings to change personality? Despite the fact that personality trait change through intervention is both desirable and possible, a general and accepted framework of how to effectively organize such interventions is still lacking.

According to one perspective (Martin, Oades, & Caputi, 2012), such interventions should be framed as *personality change coaching*, and should aim to directly change targeted traits. This concept of personality change coaching would involve taking a measure of the client's personality traits and discussing the profile with the client, with particular attention for problematic facets/traits that the client wishes to change. Similarly, Hicks and McGracken (2009) discuss problematic behaviors that can follow from dysfunctional personality traits, and suggested a range of strategies to coach the 'abrasive personality'. The common assumption underlying these top-down approaches is that personality predicts behavior and that changes in behavior, cognitions, and feelings can be obtained through interventions targeted directly on those traits.

A different approach has recently been introduced in the developmental literature by Magidson and colleagues (in press). Rather than focusing on the personality trait as the target of interest, the proposition in this bottom-up model is to focus on altering processes that underlie the manifestation of the trait that are most "accessible to monitoring and change" (i.e. behavior; see Chapman, Hampson, & Clarkin, in press). Thus, through repeated practice of new behaviors targeted through intervention, the goal is for these new behaviors to become automatic or implicit (Magidson et al., in press). It is at the point that the behaviors become ingrained that the behavior patterns ultimately manifest in trait-level changes (Chapman et al., in press; Magidson et al., in press).

In conclusion, it is argued that findings regarding reciprocity between work and personality, and -by extension- regarding the malleability of traits, open the door for more theory-driven employee development and coaching programs. Although these interventions often have the objective and evidently have the potential to change people's personality traits, to date very little is

known about their effectiveness and, if effective, about their ‘active ingredients’. One boundary condition that both approaches described above seem to have in common is that a successful intervention would only work through the motivational system by making people both aware of their proclivities and then motivated to change them.

Limitations and Future Research Directions

To conclude this general discussion, an overview is provided of the major limitations of the studies presented in this dissertation. Against this backdrop, some directions for future research are also delineated.

A Need for Objective Criteria

A first limitation that should be noted is that only self-reported indices of career advancement could be obtained in the present dissertation. It was specifically indicated in Chapter 2 that the inclusion of more ‘objective’ indicators of work-family conflict and employability could drive this line of research on career success in ‘the new career era’ an important step further. Future studies that include peer ratings, such as partner ratings of work-life imbalance or supervisor evaluations of employability, can clarify whether and to what extent the observed trait-effects are specific for personal perceptions, or whether they also generalize to more objective features of people’s work situation. With respect to the studies that addressed reciprocity between personality and work (Chapters 6 and 7 in particular), this limitation raises the question whether similar effects would be obtained if objective rather than perceived work role or occupational characteristics were assessed. For instance, an alternative approach in Chapter 7 could have been to use job titles and the derived *O*NET* (Peterson et al., 2001) RIASEC scores as objective assessments of occupational characteristics. In many cases, however, subtle or even substantial differences may exist between the concrete work activities of workers that share the same job title (e.g., “junior project manager”), particularities that may have a great influence on the personal experience of a job, and, by extension, on state- and trait-level variation.

Mediating Mechanisms in Long-Term Prediction

Except for the enterprising interests in Chapter 1, no mediating mechanisms were included in those studies that addressed the long-term validity of traits to predict career outcomes measured 15 years later. Personality traits are only distal antecedents of career outcomes, and although the hypotheses stipulated some of the more proximal mediating mechanisms (e.g., specific motives, work performance, or interpersonal behaviors), these were not directly assessed. This is one of the disadvantages of long-term longitudinal research, with only a limited number of assessment points. However, implicitly assuming certain mediating mechanisms is often justified by referring to cross-sectional or short-term longitudinal studies that have convincingly demonstrated such associations between personality and many of the more proximal antecedents of career outcomes (e.g., job performance, see for instance Barrick & Mount, 1991). It is therefore concluded that long-term prospective designs offer a powerful tool to validate the relevance of personality for career advancement, but that these are best substantiated with findings from short-term, concurrent, and even experimental studies.

Again the Bandwidth-Fidelity Dilemma

There is a long history of debate concerning the relative usefulness of the broad FFM domains versus the more specific lower level traits to understand real-life criteria (i.e. the 'bandwidth-fidelity dilemma', see for instance Ones & Viswesvaran, 1996). Also in the present dissertation, for each study it had to be decided whether facet level information should and could be included in order to adequately answer the research questions that were put forward. Eventually, it was decided to use facet information (a) in an attempt to better understand certain indicators of career advancement that are still poorly understood (e.g., perceived work-family conflict and employability in Chapter 2 and job instability in Chapter 5), and (b) to create specific FFM compounds that represent aberrant personality tendencies (see Chapter 3). No facet associations were used in those studies that addressed reciprocity between personality and work (i.e. Chapters 4, 6, and 7), mainly because of practical considerations.

Most importantly, the structural equation models that we used in these studies required the establishment of reliable latent variables, and using the personality facets as observed indicators for this purpose was the most evident choice. Moreover, we believe that focusing on the FFM domain level when investigating reciprocity between personality and work is a defensible choice in the light of an accumulation of research results that is still necessary in this domain.

Trait Interactions and Non-Linear Relationships

Another decision that was made in the scope of the present dissertation, and especially regarding objectives 2 and 3, involved the choices (a) to only look at main effects of personality traits, and (b) to only examine linear associations between these traits and indicators of career advancement. Drawing on research that has successfully addressed trait interactions and non-linear relationships in job performance research (e.g., Le et al., 2011; Witt, Burke, Barrick, & Mount, 2002), future research could also study these interactive and non-linear effects in personality-career advancement contexts. One relevant question in this context could be whether (dis)agreeableness linearly predicts (higher) financial success, or whether a turning point can be identified at which disagreeableness becomes problematic for financial success.

Issues Regarding Direction of Effects and Causality in a Reciprocal Model

A crucial aspect in establishing a reciprocal model of personality and career advancement involves the availability of longitudinal research designs that allow separating trait effects on (change in) work experiences from the reverse effects of work experiences on (change in) personality traits. This research objective essentially requires a study design in which both personality variables as well as work experiences are assessed at least twice, although more assessment points are preferred for several reasons. Three or more assessment points first offer more statistical opportunities to disentangle reciprocity with greater detail (Ferrer & McArdle, 2003, 2010). Moreover, the availability of more than two assessment points can also reveal non-linear developmental patterns. In the present dissertation, we were only able to investigate such

patterns of non-linearity for the career role trajectories. However, previous research has already indicated that patterns of trait development in adulthood might also be better represented by non-linear trajectories rather than the linear changes that were implicitly assumed in the Latent Change Models (Hopwood, Donnellan, Bloninger, & Krueger, 2011).

It is also important to point out in this context that the issue of direction of effects is not entirely the same as the issue of causality. Although cross-lagged designs, using Latent Change Models or other analytical techniques that can draw on more measurement occasions, can 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 that is described here 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, researchers are invited to come up with creative studies that combine the strengths of longitudinal approaches with more experimental methods. For this purpose, Industrial, Work, and Organizational scholars could be inspired by research from other disciplines, such as developmental psychology, where such methodologies are more widely adopted.

The Development of Aberrant Personality Tendencies

Several studies in this dissertation demonstrated how work experiences influenced individual change trajectories in FFM general or Big Five personality traits. However, given their significance for various outcomes in the personal (e.g., Trull, Ueda, Conforti, & Doan, 1997) as well as in the professional sphere (for an overview, see Wille, De Fruyt, & De Clercq, in press), additional knowledge about how these work experiences might stimulate the development of (subclinical) aberrant personality tendencies also seems warranted. For instance, can highly competitive work environments lead individuals to develop antisocial tendencies? Under which conditions? What are the precise situational features that might trigger such effects?

Variable versus Person-Centered Approaches

Finally, in the present dissertation only variable-centered approaches were used to address the three central research objectives. These analytic models are predicated on the assumption that the population is homogeneous with respect to how the predictors operate on the outcomes, and are indeed well suited for questions that concern the relative importance of predictor variables in explaining variance in these outcome variables (Magnusson, 2003). However, especially for questions concerning aspects of development over time, alternative person-centered approaches can also be informative, and constitute an interesting avenue for future research. Person approaches describe differences among individuals in how variables are related to each other: *“The identification of groups of individuals who function in a similar way at the organism level and in a different way relative to other individuals at the same level”* (Magnusson, 2003, p. 16). While gaining increasing importance in other disciplines of psychology, such as developmental psychology, person-centered approaches remain somewhat underutilized in applied research (De Fruyt, 2002; Kossek, Ruderman, Braddy, & Hannum, 2012; Reitzle & Vondracek, 2000). Interesting questions in the context of the present dissertation that could be addressed using a person-centered approach, include: Can different groups of people be identified in terms of career role trajectories; Do these groups differ in terms of personality profiles; And how about their success attainment? Similarly, in Chapter 7 the effect of occupational characteristics on personality trait change was examined by inspecting the reciprocal associations between the six RIASEC dimensions and the five FFM traits. An alternative, person-centered approach would involve examining trait change patterns for different groups of people, for instance categorized on the basis of their primary RIASEC vocational type.

Conclusion

In this dissertation, a multi-stage and multi-faceted longitudinal study was presented in which a cohort of highly educated and talented young professionals was tracked across the first 15 years of their professional career. During this substantial and significant period of time, participants developed

personally as well as professionally, and both dynamic processes moreover showed to be interrelated. We learned that this kind of longitudinal study is challenging to carry out, but that investing some time and effort in it eventually pays off in terms of the empirical, theoretical, and applied implications. Specifically, the findings expand our knowledge on fundamental processes of personality development; on applied models of personality functioning at work; and on the interaction between both. In terms of implications for practice, findings regarding reciprocity and -by extension- regarding the malleability of personality traits open the door for a new set of interventions in the context of personality trait coaching. It is concluded that the longitudinal, dynamic and reciprocal approach to personality and career advancement presented here may shed a new light on the broad topic of talent management in organizational settings.

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Tables

Table 1

Overview of the long-term prospective effects of FFM general traits on extrinsic versus intrinsic career success

FFM traits	Extrinsic success		Intrinsic success	
	Management level	Income level	Perceived employability	Work-family conflict
Neuroticism			-	-
Extraversion	+	+		
Openness				
Agreeableness		-		+
Conscientiousness		+		-

Note. In order to facilitate comparisons across success criteria, the effects for work-family conflict are coded such that “+” indicates higher intrinsic success (thus lower levels of conflict), and “-” indicates lower intrinsic success (thus higher conflict levels).

Table 2

Overview of how FFM general trait levels predict dynamic criteria

FFM traits	Dynamic criteria			
	Work attitudes	Job transitions	Career role growth	RIASEC changes
Neuroticism	<ul style="list-style-type: none"> • smaller increase in satisfaction 	-	<ul style="list-style-type: none"> • greater Maker role growth 	<ul style="list-style-type: none"> • greater increase in Social • greater increase in Conventional
Extraversion	<ul style="list-style-type: none"> • greater increase in satisfaction 	-	<ul style="list-style-type: none"> • greater Guide role growth 	-
Openness	<ul style="list-style-type: none"> • smaller increase in involvement 	<ul style="list-style-type: none"> • more external moves 	<ul style="list-style-type: none"> • greater Expert role growth 	<ul style="list-style-type: none"> • greater decrease in Realistic • smaller decrease in Artistic • greater increase in Social
Agreeableness	<ul style="list-style-type: none"> • greater increase in satisfaction • smaller increase in involvement 	<ul style="list-style-type: none"> • less job instability • less external moves 	<ul style="list-style-type: none"> • greater Director role growth 	<ul style="list-style-type: none"> • greater increase in Social • smaller increase in Enterprising
Conscientiousness	-	-	<ul style="list-style-type: none"> • smaller Expert role growth • smaller Director role growth • smaller Inspirator role growth 	-

Note. This table summarizes how high scores on baseline FFM traits predict subsequent changes in work attitudes, job transitions, career role growth, and changes in RIASEC occupational characteristics.

Table 3

Overview of how work experiences are related to trait change

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
<i>Work attitudes</i>					
Satisfaction	-	-	-	Greater increase	-
Involvement	-	-	-	-	-
<i>Career roles</i>					
Expert	-	-	-	-	Greater increase
Maker	-	-	-	Greater increase	-
Presenter	Greater decrease	Greater increase	-	-	-
Guide	-	-	-	-	Greater increase
Director	Greater decrease	-	-	Mixed effect	Greater increase
Inspirator	Greater decrease	-	-	Smaller increase	Greater increase
<i>Occupational characteristics</i>					
Realistic	Greater decrease	-	-	Greater increase	Greater increase
Investigative	-	-	-	Greater increase	-
Artistic	-	-	-	-	-
Social	-	-	-	-	-
Enterprising	-	-	Greater decrease	Smaller increase	-
Conventional	-	-	Greater decrease	Smaller increase	-

Note. For work attitudes and occupational characteristics, this table only shows the effects of initial work experience levels on subsequent trait changes; no correlated changes. For career role development, this table only shows patterns of correlated change, and no distinction is made between first versus second career stage effects (except for Director role and Agreeableness where mixed effects were found).

Nederlandstalige samenvatting

Persoonlijkheid en loopbaanontwikkeling: Een wederkerige benadering

Persoonlijkheid neemt een centrale positie in binnen de hedendaagse toegepaste psychologie. Na een min of meer turbulente onderzoeksgeschiedenis is het tegenwoordig een wijdverspreid idee dat trekken van mensen gerelateerd zijn aan een brede waaier van relevante criteria, waaronder motivatie, attitudes, leiderschap, stress, werkgedrag, en loopbaankeuzes (Judge, Klinger, Simon, & Yang, 2008). Een van de meest centrale bevindingen in deze literatuur is bovendien dat persoonlijkheid, onder bepaalde omstandigheden en gegeven specifieke contexten, een significante voorspeller kan zijn van hoe mensen presteren in hun job (Barrick & Mount, 1991).

Als uitbreiding van dit soort bevindingen is er in de literatuur ook toegenomen aandacht voor de rol van persoonlijkheid voor aspecten van loopbaanontwikkeling. De centrale idee is dat, als er bepaalde trekken zijn die mensen succesvol maken in hun job, die trekken dan ook predictief moeten zijn voor het succes en de vooruitgang die mensen boeken op langere termijn, tijdens de gehele loopbaan. Het huidige doctoraatsproefschrift situeert zich in deze brede onderzoeksliteratuur omtrent persoonlijkheid en loopbaanontwikkeling, en stelt drie specifieke onderzoeksvragen voorop: (1) Wat zijn de lange termijn effecten van persoonlijkheid voor diverse indicatoren van loopbaansucces? (2) Hoe is persoonlijkheid gerelateerd aan diverse dynamische aspecten van loopbaanontwikkeling? (3) Welke zijn de wederkerige effecten van loopbaanontwikkeling voor de ontwikkeling van persoonlijkheid? Als overkoepelend objectief stellen we een herconceptualisatie van persoonlijkheid in de onderzoeksliteratuur voorop, waarbij enerzijds trekken richting geven aan

de loopbanen van mensen en anderzijds trekken ook op hun beurt beïnvloed worden door aspecten van loopbaanontwikkeling. Dit wordt samengevat als de wederkerige benadering van persoonlijkheid en loopbaanontwikkeling.

Om deze onderzoeksvragen te toetsen wordt gebruik gemaakt van een longitudinaal onderzoeksdesign dat reeds 20 jaar geleden werd opgestart aan de Vakgroep Ontwikkelings-, Persoonlijkheds-, en Sociale Psychologie. Op initiatief van toenmalig promovendus Filip De Fruyt en diens promotor Prof. Dr. Ivan Mervielde werd in 1994 een grootschalige bevraging georganiseerd bij de laatstejaarsstudenten aan de Universiteit Gent en de toenmalige Katholieke Industriële Hogeschool Gent. Tot op heden en verspreid over de afgelopen 18 jaar werden in totaal vier bevraging rondes bij deze zelfde groep van alumni georganiseerd: in 1994 (vlak voor afstuderen), in 1995 (na 1 jaar op de arbeidsmarkt), in 2009 (15 jaar na arbeidsmarktintrede en voor het eerst in het kader van voorliggend doctoraatsproject), en een laatste maal in 2010. Voor het huidige doctoraatsproefschrift worden gegevens gebruikt die verzameld werden tijdens elk van deze vier meetmomenten. In totaal werden op basis hiervan zeven empirische studies uitgewerkt die als doel hadden om diverse aspecten van het vooropgestelde wederkerige model van persoonlijkheid en loopbaanontwikkeling empirisch te toetsen.

In het eerste empirische hoofdstuk ligt de focus op de lange termijn predictieve validiteit van algemene Big Five persoonlijkheidstrekken voor indicatoren van extrinsiek of objectief loopbaansucces (inkomen en managementniveau) na 15 jaar op de arbeidsmarkt. Daarnaast wordt ook een bijdrage geleverd aan de literatuur omtrent persoonlijkheid en objectief succes door een bijkomende individuele verschilvariabele, namelijk beroepsinteressen, als mediërende factor mee op te nemen. De resultaten tonen aan dat met name drie trekken relevant zijn voor de voorspelling van deze objectieve succesmaten: Extraversie (positief effect), Consciëntieusheid (positief effect), en Altruïsme (negatief effect). Bovendien verklaren ondernemende beroepsinteressen nog additionele variantie in objectief loopbaansucces bovenop persoonlijkheidstrekken, en lijken deze interessen de relaties tussen persoonlijkheid en objectief succes grotendeels te mediëren. Deze resultaten

werpen een nieuw licht op de relatie tussen persoonlijkheid en extrinsiek loopbaansucces, een relatie die doorgaans louter vanuit een prestatieperspectief wordt bekeken.

Hoofdstuk 2 situeert zich eveneens in de context van de lange termijn effecten van algemene persoonlijkheid op toekomstig loopbaansucces, maar richt zich hierbij op twee intrinsieke (subjectieve) criteria van succes die meer en meer centraal zijn komen te staan in de hedendaagse literatuur omtrent “Nieuwe Loopbanen”. Meer specifiek wordt in deze studie nagegaan of algemene persoonlijkheidstrekken predictief zijn voor latere percepties van inzetbaarheid (“Employability”) en werk-privé balans (“Work-Family Conflict”). Bovendien worden deze associaties in deze studie ook op facetniveau bekeken. De resultaten tonen aan dat Neuroticisme een belangrijke voorspeller is van toekomstig intrinsiek loopbaansucces (negatief effect). De trekken Altruïsme (negatief effect) en Consciëntieusheid (positief effect) zijn bovendien ook significante voorspellers van gepercipieerde *Work-Family Conflict* in het bijzonder. Analyses op facetniveau laten tenslotte toe om deze associaties tussen persoonlijkheid en subjectief loopbaansucces beter te kunnen begrijpen.

Terwijl in Hoofdstukken 1 en 2 telkens gekeken wordt naar de predictieve validiteit van algemene persoonlijkheidstrekken voor extrinsieke en intrinsieke criteria van loopbaansucces, ligt in Hoofdstuk 3 de focus op de relevantie van meer abnormale of afwijkende persoonlijkheidstendensen voor deze en andere loopbaanuitkomsten. Hiertoe wordt in eerste instantie het dimensionale perspectief op persoonlijkheids(dys)functioneren verder toegelicht, gevolgd door een literatuuroverzicht van de predictieve validiteit van eerder afwijkende persoonlijkheidstendensen in organisationele contexten. Vervolgens wordt in deze studie een ‘FFM compound methodologie’ (Miller, Bagby, Pilkonis, Reynolds, & Lynam, 2005) gebruikt om de lange termijn predictieve validiteit van zes subklinische persoonlijkheidstendensen (schizotypisch, ontwijkend, borderline, antisociaal, narcistisch, obsessief-compulsief) in de alumnistudie te toetsen. Via diverse technieken wordt aangetoond dat deze tendensen wel degelijk relevant zijn voor de voorspelling

van diverse loopbaanuitkomsten, ook indien tegelijkertijd rekening gehouden wordt met meer algemene (Big Five) trekken en diverse situationele kenmerken.

In Hoofdstuk 4 wordt voor het eerst een dynamisch perspectief op loopbaanontwikkeling gehanteerd, en ligt de klemtoon op verandering in werkgerelateerde ervaringen tijdens de eerste helft van de professionele loopbaan. Meer specifiek wordt gekeken naar veranderingstrajecten van werk attitudes (satisfactie en betrokkenheid), en hoe deze gerelateerd zijn aan (verandering in) algemene persoonlijkheidstrekken. Deze studie biedt voor het eerst empirische evidentie voor een maturatie-visie op attitudes, zoals recent geopperd door Ng en Feldman (2010). De resultaten tonen bovendien ook aan dat de longitudinale relatie tussen persoonlijkheid en werk attitudes eerder bi- dan unidirectioneel is, aangezien een hoger niveau van job satisfactie ook predictief is voor een sterkere toename in Altruïsme.

In Hoofdstuk 5 wordt verder ingegaan op het dynamische aspect van loopbaanontwikkeling, en wordt specifiek gekeken naar de frequentie van externe en interne job wisselingen en hoe persoonlijkheid en beroepsinteressen dergelijke maten van job instabiliteit voorspellen. Deze resultaten bieden verdere evidentie voor een individueel verschillenperspectief op job mobiliteit (zie bijvoorbeeld Vinson, Connelly, & Ones, 2007). Met betrekking tot de lange termijn effecten van persoonlijkheid, werd gevonden dat met name twee Big Five trekken relevant zijn voor de voorspelling van job instabiliteit: Altruïsme (negatief effect) en Openheid voor ervaringen (positief effect). Facet analyses tonen verder aan dat sommige Big Five trekken, bijvoorbeeld Extraversie, wellicht te breed zijn om dergelijke indicatoren van job instabiliteit adequaat te verklaren. Deze studie heeft als voornaamste beperkingen dat er geen onderscheid gemaakt kon worden tussen opwaartse versus eerder neerwaartse vormen van mobiliteit, en dat de wisselingen zowel vrijwillig als eerder onvrijwillig konden zijn. Echter, de resultaten wijzen er op dat persoonlijkheidstrekken niet enkel predictief zijn voor veranderingen in subjectieve werkervaringen (zoals attitudes), maar ook voor daadwerkelijke job wisselingen over een langere tijdsperiode.

Daar waar Hoofdstuk 5 focust op de frequentie van job wisselingen, ligt in Hoofdstuk 6 de klemtoon op de aard van deze veranderingen, meer specifiek in termen van loopbaanroltransities. Deze studie is gegrond in de rijke literatuur omtrent ‘persoon-omgeving congruentie’, en onderscheidt zich van vorig onderzoek door dit thema vanuit een dynamisch en wederkerig perspectief te benaderen. Hiertoe wordt een recent ontwikkelde taxonomie van zes loopbaanrollen (Bestuurder, Adviseur, Realisator, Inspirator, Expert, Presentator) gehanteerd, gekaderd binnen een sterke ontwikkelingsvisie op loopbanen (Hoekstra, 2011). Met behulp van een interactieve webapplicatie werd van elke participant een geïndividualiseerd traject van loopbaanroltransities gereconstrueerd. De resultaten tonen wederkerige relaties aan tussen diverse persoonlijkheidstrekken en aspecten van loopbaanrolgroei over een 15-jarig tijdsinterval. Bovendien wordt aangetoond dat het effect van loopbaanrolinvestering zowel een positief als negatief effect kan hebben op de normatieve ontwikkelingstendensen van persoonlijkheid, afhankelijk van de specifieke inhoud van de loopbaanrol. Het ontstaan en de graduele ontwikkeling van een loopbaanidentiteit wordt naar voren geschoven als een theoretisch mechanisme om de wederkerige relatie tussen persoonskenmerken en loopbaanrolontwikkeling beter te begrijpen.

Terwijl de loopbaanroltransities in Hoofdstuk 6 op een retrospectieve manier werden gereconstrueerd, wordt in Hoofdstuk 7 de verandering in werkomgevingen over de eerste loopbaanhelft op een meer prospectieve manier in kaart gebracht. De klemtoon in deze studie ligt op de diverse reciproque relaties (*selection*, *activity*, *reactivity*, en *correlated change*) tussen Big Five persoonlijkheidstrekken en beroepskenmerken zoals gedefinieerd binnen het wijdverspreide Holland model van beroepsomgevingen (Holland, 1997). De resultaten tonen aan dat persoonlijkheid niet enkel predictief is voor de selectie van bepaalde beroepsomgevingen aan het begin van de loopbaan, maar ook voor daaropvolgende veranderingen in beroepskenmerken. Echter, naast deze selectie- en gravitatie-effecten wordt ook evidentie gevonden voor diverse “secondary effects” in de theorie van Holland, hier geoperationaliseerd als *reactivity effects*, zijnde de effecten van initiële beroepskenmerken op

daaropvolgende persoonlijkheidsverandering. Bovendien blijkt dat, net zoals in Hoofdstuk 6, het effect van loopbaanervaringen op persoonlijkheidsontwikkeling afhankelijk is van de specifieke kenmerken van die loopbaanomgeving. Terwijl Realistisch/Intellectuele beroepskenmerken een normatieve toename in Altruïsme faciliteren, wordt deze toename eerder gebufferd door Ondernemend/Conventionele beroepskenmerken. Deze resultaten dringen verder aan op een verfijning van het *Social Investment Principle* (Lodi-Smith & Roberts, 2007) dat globaal stipuleert dat het uitbouwen van een professionele loopbaan enkel normatieve persoonlijkheidsveranderingen, zoals een toename in Altruïsme, stimuleert.

Samengevat leveren de studies in dit proefschrift empirische evidentie voor een longitudinaal, dynamisch en wederkerig model van persoonlijkheid en loopbaanontwikkeling. De theoretische implicaties van dit model zijn relevant voor zowel persoonlijkheids- als toegepast psychologen. Specifiek voor de persoonlijkheidsliteratuur wijzen de bevindingen er op dat de effecten van werkgerelateerde ervaringen complexer zijn dan oorspronkelijk gedacht, met name indien rekening gehouden wordt met de specifieke aard van de werkomgevingen waarin mensen tewerkgesteld zijn. Voor de toegepaste literatuur tonen de studies aan dat de bestaande modellen van persoonlijkheid, werkgedrag, en loopbaansucces ontoereikend zijn om dergelijke wederkerigheid in rekening te brengen. In termen van implicaties naar de praktijk, tenslotte, bieden resultaten omtrent wederkerigheid en -bij uitbreiding- veranderbaarheid van persoonlijkheidstrekken mogelijke aanknopingspunten voor een nieuwe set van organisatie- of loopbaaninterventies gericht op het bijsturen van afwijkende of ongewenste persoonlijkheidstendensen. Deze interventies hebben het potentieel om in de toekomst deel uit te maken van een ruimer organisatiebeleid rond talent management.

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