Reciprocal Influences between Personality Traits and Career Transitions

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List of Abbreviations

ANZSCO	Australian and New Zealand Standard Classification of Occupations
CFI	Comparative fit index
DDM	Dynamic Developmental Model
HILDA	Household, Income and Labor Dynamics in Australia
RMSEA	Root-mean-square error of approximation
SOEP	(German) Socioeconomic Panel
SRMR	Standardized root-mean-square residual
TMGT	Too-much-of-a-good-thing

1 Introduction

> *"We are all born with a unique genetic blueprint, which lays out the basic characteristics of our personality […] And yet, we all know that life experiences do change us."*
>
> Joan D. Vinge

The notion that certain life experiences can change who we are would probably be acknowledged by most people. Positive life events, such as marriage, completing one's education, or receiving a promotion as well as negative life events, such as the death of a family member, personal illness, or dismissal from work, are likely to have an effect on our personal development. Given that work plays such a fundamental role in most people's lives, one may even suspect that work experiences have the potential of shaping our personalities. While this conjecture may sound appealing to laypeople, most psychologists would probably be skeptical: Personality research has long suggested that personality traits are stable inter-individual dispositions that develop independently of the changes that occur in one's environment (McCrae, et al., 2000). Therefore, personality traits have been investigated extensively as predictors of work-related experiences, but only very few studies have considered personality changes as an outcome of work.

The contribution of this dissertation is twofold. First, it aims to advance existing knowledge on the role of personality traits in explaining work-related outcomes. The focus of this first contribution lies on the effect that different personality traits have on actual career transitions, such as starting one's own business or changing one's job into hierarchically higher positions. Second, it challenges our current understanding of personality as an immutable disposition that is regarded solely as a predictor of work-related outcomes. More specifically, it examines whether personality traits not only predict, but also follow from certain career transitions, including self-employment, upward job changes into managerial

and professional positions, unemployment, and reemployment. By investigating such reciprocal influences between personality traits and career transitions, I hope to advance our understanding of the dynamic role that personality plays at work.

1.1 Personality as a Predictor of Career Transitions

Personality traits have been investigated as predictors of work experiences by scholars for decades (Hough, 1998). In fact, few topics have received as much empirical attention in work and organizational psychology as personality research (Woods, Lievens, De Fruyt, & Wille, 2013). Up to the 1990s, the *dispositional approach*, which suggests that personality traits predict attitudes towards and behavior at work, was criticized for its lack of predictive validity in explaining work-related outcomes (Davis-Blake & Pfeffer, 1989; Guion & Gottier, 1965; Mischel, 1968). Scholars noted that years of research on personality had produced only limited insights into behavior at the workplace (Weiss & Adler, 1984) and that none of the personality tests developed for personnel selection had actually lived up to its promise of predicting performance on the job (Guion & Gottier, 1965). By the 1990s, however, several large-scale meta-analyses revealed that personality traits indeed predict a variety of attitudes and behaviors at work, such as job satisfaction (Judge, Heller, & Mount, 2002), job performance (Barrick & Mount, 1991), and leadership behaviors (Bono & Judge, 2004). Empirical studies furthermore showed that specific personality traits correlate with relevant work-related outcomes, including citizenship behaviors, turnover, absenteeism, and success in groups (Barrick & Mount, 2005). In sum, most researchers and practitioners nowadays would probably agree that personality traits indeed play a relevant role at the workplace.

Despite its relevance in the world of work, personality is a term that is not easily defined and has even been described as one of the most abstract words in the English language (Allport, 1937). Paul Costa has put forward a definition that adequately illustrates psychologists' view of personality in work-related contexts: He suggests that "personality

traits are pervasive styles of thinking, feeling, and behaving, and as such they are likely to affect vocational interests and choices" (Costa, 1996, p. 225). In his definition, Costa thus captures the essence of the dispositional approach in work and organizational psychology, which suggests that individuals possess unobservable dispositions that shape their attitudes toward and behavior in work-related settings (Davis-Blake & Pfeffer, 1989). Particularly the second part of Costa's definition, which suggests that personality traits "affect vocational interests and choices" (Costa, 1996, p. 225), is also inherent in several theories concerned with the role of personality in predicting individuals' occupational choices. According to these theories, there is a *selection effect* of personality in vocational settings, suggesting that people self-select into occupations that match their personalities. Since the selection effect constitutes one of the main arguments underlying this dissertation, the theories supporting the role of personality in individuals' vocational choices will be outlined briefly below.

According to the *theory of vocational choice* (Holland, 1959), people choose work environments according to their personalities. Holland (1959) differentiates between six different personality styles, namely the realistic, investigative, artistic, social, enterprising, and conventional types. The theory furthermore suggests that work environments can be classified in the same way as personality styles, thus discriminating between six different types of work environments. When deciding upon an occupation, people self-select into work environments that allow them to express their personalities, resulting in congruencies between individuals' personality types and the environments they choose to work in. Research has indeed suggested that individuals who work in environments that are congruent with their personalities tend to be both more satisfied and more successful (for an overview, see Furnham, 2001). Similar to the theory of vocational choice (Holland, 1959), *person-environment fit theory* (Caplan, 1987; Sims, 1983) also tries to explain how people choose their occupations, suggesting that job-seekers self-select into jobs that they perceive can

fulfill their needs, resulting in a good fit between the occupations' attributes and the job seekers' personalities. Person-environment fit theory has received substantial empirical support, with particularly convincing results stemming from experimental research (for an overview, see Cable & Judge, 1996). A third theory supporting the notion that people choose work environments that match their personalities stems from the *attraction-selection-attrition model* (Schneider, 1987). It argues that organizations tend to attract, select, and retain individuals who share similar personalities, resulting in homogenous staff in organizations. The attraction component of the model strongly mirrors the propositions of both the theory of vocational choice (Holland, 1959) and person-environment fit theory (Caplan, 1987; Sims, 1983), suggesting that individuals are attracted to jobs that are congruent with their personalities. In sum, several renowned psychological theories thus support the selection effect of personality in individuals' vocational choices, an assumption that provides one of the guiding frameworks of this dissertation.

Investigating the role of personality traits as predictors of vocational choices, and actual work-related decisions in particular, is the first main contribution of this dissertation. Much of the previous research on personality at work has focused on the role of personality in explaining individuals' attitudes towards occupations or their behavior at the workplace. Those studies have mainly relied on cross-sectional or longitudinal data and have established the extent to which personality traits explain variance in a number of continuous outcomes. I aim to extend those findings by exploring whether certain personality traits likewise have an effect on *actual* career transitions. Since career transitions are operationalized as dichotomous variables, the analyses capture whether individuals actually do or do not behave according to their vocational choices on the basis of their personality traits. The results thus inform us about the role of personality in explaining whether or not individuals experience certain

career transitions. As career transitions tend to entail drastic changes in people's professional lives, the findings shed light on personality traits as predictors of such incisive events.

The aim of exploring the effect of personality traits on subsequent career transitions calls for analyses based on longitudinal data. All analyses were therefore conducted on the *German Socioeconomic Panel (SOEP)* or the *Household, Income and Labor Dynamics in Australia (HILDA)* survey. Both are large longitudinal datasets collected from private households in Germany and Australia, respectively. Since panel members are interviewed repeatedly in each wave, both surveys allow investigating the effect of personality assessed in one wave on subsequent career transitions assessed in later waves. In order to test whether personality traits indeed predict career transitions, event history analyses (also known as survival analyses) were applied to those longitudinal datasets. This analytic approach allowed estimating whether or not a career transition occurred while also considering the time it took for the transition to take place.

In Chapter 2, which is based on a study conducted with Torsten Biemann, event history analyses are applied to the SOEP to investigate the role of individuals' willingness to take risks in predicting self-employment. Self-employment is not only highly relevant for societies, given its economic output and employment potential, but also constitutes a major career transition for individuals. While several personality traits have been investigated as potential predictors of venture creation, Chapter 2 focusses on the trait of risk propensity. More specifically, the study investigates whether risk propensity predicts the career transition of becoming self-employed and finds support for the notion that higher levels of risk taking are associated with a higher probability of starting one's own business. The same is, however, not the case for self-employment survival: The effect of risk propensity on venture survival is not linear, but seems to follow an inverted U-shaped function. Chapter 2 thus not only explores whether personality traits predict the career transition of becoming self-employed,

but also investigates the role of risk propensity in explaining the success of that transition in terms of venture survival.

Chapter 3 constitutes a replication and extension of the study described in Chapter 2. It includes an investigation of the effect of risk propensity on subsequent self-employment entry and self-employment survival, which is, however, based on the HILDA sample. In addition, Chapter 3 also investigates whether the experiences made during self-employment have the potential of evoking changes in individuals' willingness to take risks, a research question which will be addressed in more detail in the following sections of this introduction. The results of the analyses presented in Chapter 3 provide further support for a positive effect of risk propensity on self-employment entry. The role of individuals' willingness to take risks in explaining self-employment survival is less clear, since the results are statistically non-significant. Their graphical representations, however, suggest that particularly low levels of risk propensity may be detrimental for venture survival.

Chapter 4 is based on a study that was conducted with Hannes Zacher at the University of Queensland, Australia, and includes both a different set of personality traits and a different type of career transition than Chapters 2 and 3. More specifically, it examines whether the Big Five personality traits have an effect on upward job changes into managerial and professional positions. The potentially reciprocal effect of such upward job changes on personality, which is also investigated in the study, will again be discussed in more detail below. Analyses are based on the HILDA sample and reveal that individuals' openness to experience predicts upward job changes into managerial and professional positions.

In sum, this dissertation thus includes three studies which are described in Chapters 2, 3, and 4, that are concerned with the effect of different personality traits on subsequent career transitions. Results offer support for the notion that risk propensity predicts self-employment entry and potentially also self-employment survival. One of the Big Five personality traits,

namely openness to experience, seems to have an effect on upward job changes into managerial and professional positions. The findings obtained in this dissertation thus suggest that certain personality traits indeed play a role in predicting career transitions, offering support for a selection effect of personality in career transitions.

1.2 Personality Changes as an Outcome of Career Transitions

As outlined above, there is a long tradition in work and organizational psychology of studying the role of personality in organizational and vocational settings. While those studies cover a wide range of relationships between personality traits and work-related experiences, they commonly share the same underlying assumption: Personality is regarded as a stable disposition which must therefore predict work-related outcomes rather than the other way around. This conception is also inherent in the dispositional approach, which implies that individuals' dispositions do not change over time or in response to events that take place in one's environment. It has been supported by a body of literature, showing that personality basically remains stable after the age of 30 (Cobb-Clark & Schurer, 2012; Costa & McCrae, 1997; Jackson, Hourany, & Vidmar, 1972; Moss & Susman, 1980).

On the one hand, the notion that personality is stable over the lifespan has thus found substantial empirical support. On the other hand, scholars have questioned those results and suggested that the stability of personality traits depends on the stability of one's social environment (Ardelt, 2000).[1] In the work-related context, it has been noted that "individuals are highly responsive and adaptive to organizational settings and that personality traits change in response to organizational situations" (Davis-Blake & Pfeffer, 1989, p. 387). The proposition that work-related experiences may have an effect on individuals' personalities is also posited by the *socialization effect*. In contrast to the selection effect, the socialization

[1] A large body of literature is also concerned with the mean-level stability and rank-order consistency of personality traits (Lucas & Donnellan, 2011; Roberts et al., 2006). That literature will not be reviewed here, since it is concerned with average trait changes in certain populations at certain ages, not with changes that occur in response to life events.

effect suggests that personality traits do not only lead to, but also follow from certain work experiences. The proposition of the socialization effect has received limited research attention (for an overview see Woods et al., 2013). Studies have shown that success and satisfaction at work may enhance individuals' internal locus of control (Andrisani & Nestel, 1976), emotional stability, and conscientiousness (Roberts, Wood, & Caspi, 2008), while levels of neuroticism decrease (Scollon & Diener, 2006). In their recent study, Wille and de Fruyt (2014) found that vocations, which they classify according to Holland's theory of vocational choice (1959), shape individuals' personality over time. With respect to career transitions, it has been found that military training reduces individuals' levels of agreeableness (Jackson, Thoemmes, Jonkmann, Lüdtke, & Trautwein, 2012) and that students who spend time abroad become more open to experience, more agreeable, and less neurotic (Zimmermann & Neyer, 2013). Furthermore, work characteristics have been found to affect employees' proactive personality (Li, Fay, Frese, Harms, & Gao, 2014)

Despite such preliminary research findings suggesting that work experiences may indeed shape personality development, theoretical explanations of the socialization effect are still far less advanced than theories explaining the selection effect. One potential explanation for the effect of work-related experiences on changes in individuals' personalities stems from *social investment theory* (Roberts, Wood, & Smith, 2005). It posits that personality development occurs because individuals enter new social roles, such as starting to work or becoming a parent. Since each social role is associated with certain expectations, such as being increasingly conscientious at work or emotionally stable as a parent, individuals are likely to behave according to those expectations. Moreover, they invest in the new social roles by making a psychological commitment to them and subsequently building their identities around them. According to social investment theory, individuals should thus exhibit increases in the traits that are associated with the new social role they enter. The theory

therewith provides an explanation for the socialization effect on personality development following career transitions.

Another theoretical proposition that is concerned with the effect of work experiences on personality development is the *corresponsive principle* (Roberts, Caspi, & Moffitt, 2003). It aims to explain both the selection and the socialization effect of personality in the context of career transitions. More specifically, the corresponsive principle suggests that the personality traits that lead to certain work experiences are the same ones that are likely to be increased in response to those experiences. For example, individuals high in extraversion may self-select into the occupation of a salesperson, because the occupational setting matches their personality. The role of a salesperson is commonly associated with being talkative, assertive, and outgoing, all of which are facets of extraversion. Individuals who have entered that role are thus likely to behave accordingly and psychologically commit to their new role. They are furthermore likely to be rewarded for their extraverted behavior, which may subsequently lead to even more pronounced levels of extraversion. The corresponsive principle has found some empirical support, showing that the personality trait of dominance self-selects individuals into jobs that involve resource power. Working in such occupations in turn leads to increases in the trait of dominance (Caspi, Roberts, & Shiner, 2005). Also, agreeableness not only serves as a negative predictor of military training, but is also diminished by that work experience (Jackson et al., 2012). Two further studies have found that there are reciprocal influences between the Big Five personality traits and occupational characteristics (Wille & De Fruyt, 2014) as well as between proactive personality and work characteristics (Li et al., 2014).

The second main aim of this dissertation is to identify work-related experiences that have the potential of evoking changes in individuals' personality traits. Since personality traits are traditionally regarded solely as predictors in the world of work, this perspective is

not neglected and has been described in more detail in the previous section of this dissertation. I, however, aim to extend that traditional perspective by investigating whether personality traits not only predict, but also follow from work-related experiences. I again focus on actual career transitions and explore whether they are events salient enough to shape individuals' personality development over time. Results of that approach offer a novel perspective in work and organizational psychology and more specifically on the potentially reciprocal influences between personality and work.

Investigating reciprocal influences between personality traits and career transitions requires an elaborate methodological approach. First, comprehensive longitudinal data is needed that includes a sample large enough to detect the potentially small changes in personality, yet heterogeneous enough to ensure generalizability of the results. Both the SOEP and the HILDA are large, representative samples of the German and Australian population, respectively, therewith fulfilling those requirements. Second, the statistical analyses have to account for the fact that the data are observational, not experimental. For estimating whether career transitions indeed predict changes in individuals' personalities, the methodologically best approach would be to conduct an experiment: Participants would be randomly assigned to the experimental group experiencing a career transition or to the control group experiencing no career transition. Since this approach is not feasible, inferences have to be drawn from observational data. In this dissertation, I make use of *propensity score matching* (Rosenbaum & Rubin, 1983) to estimate the effects of career transitions on personality traits. Propensity score matching aims to estimate causal effects by accounting for the covariates that are observed prior to the treatment, which, in this case, is a career transition. More particularly, individuals from the experimental and the control group are matched by stochastically balancing those observed covariates (Haviland, Nagin, & Rosenbaum, 2007). This procedure thus follows the same purpose as a random assignment of

participants would do in an experiment, namely to ensure that participants in the experimental and control group do not differ in systematic ways. By applying propensity score matching to the SOEP and the HILDA sample, the causal effects of different career transitions on different personality traits can thus be estimated.

Chapter 3 is not only concerned with the effect of risk propensity on self-employment described in the previous section, but also investigates the role of self-employment in predicting individuals' subsequent willingness to take risks. By applying propensity score matching to the HILDA sample, I find that self-employment entry leads to increases in entrepreneurs' risk propensity. Results thus offer primary support for the notion that career transitions may indeed foster personality development over time. This assumption is put to a further empirical test in Chapters 4 and 5. In Chapter 4, results of the analyses applied to the HILDA sample suggest that upward job changes into managerial and professional positions have an effect on employees' subsequent openness to experience. Chapter 5, which is based on data from the SOEP, advocates that both unemployment and reemployment affect individuals' subsequent locus of control. More specifically, people who lose their job tend to become more external, while gaining reemployment after job loss leads to more internal control beliefs. All in all, the results of Chapters 3, 4, and 5 thus offer support for the notion that career transitions, such as becoming self-employed, changing one's job, or becoming unemployed or reemployed may have an effect on certain personality traits.

1.3 Outcomes of Personality Changes

As an extension to Chapters 3 and 4, which are mainly concerned with the reciprocal effects between personality and career transitions, Chapter 5 furthermore aims to shed light on the consequences of personality changes. Previous research has already suggested that changes in individuals' personalities may lead to certain health-related outcomes. For example, Mroczek and Spiro (2007) have found that increases in neuroticism over a longer

timeframe positively predict mortality. In Chapter 5, which is based on a study that was conducted with Torsten Biemann, the processes following unemployment on the one hand and reemployment on the other hand are investigated. As a guiding framework, the *stress process model* (Pearlin, Menaghan, Lieberman, & Mullan, 1981), which is concerned with the consequences of stressful life events, is used. The model is first applied to the event of unemployment, and analyses reveal that job loss and strains predict changes in individuals' locus of control, which subsequently have an effect on health. Second, it is investigated whether the negative processes following job loss are reversed when individuals gain reemployment. This indeed seems to be the case, since reemployment decreases strains and restores individuals' internal control beliefs, subsequently affecting levels of health. The findings thus not only provide further support for the notion that career transitions predict subsequent personality, but also offer insight into the health-related consequences following personality changes.

Overall, this dissertation thus aims to advance knowledge concerning the role of personality in explaining career transitions on the one hand and the effect of those career transitions on subsequent personality changes on the other hand. Its first main contribution, which involves estimating the effect of personality traits on actual career transitions, is dealt with in Chapters 2, 3, and 4. While Chapters 2 and 3 are concerned with the effect of risk propensity on self-employment, Chapter 4 studies the role of the Big Five in predicting upward job changes into managerial and professional positions. Chapters 3, 4, and 5 are furthermore concerned with the second main contribution of this dissertation, namely to investigate whether career transitions also have the potential of evoking changes in individuals' personality traits. The role of self-employment in changing individuals' willingness to take risks is targeted in Chapter 3, while the effect of upward job changes on the Big Five personality traits is considered in Chapter 4. In Chapter 5, the role of

unemployment and reemployment in shaping individuals' control beliefs is explored. Additionally, Chapter 5 also sheds light on potential health-related outcomes of personality changes.

2 The Role of Risk Propensity in Predicting Self-Employment[2]

This study aims to untangle the role of risk propensity as a predictor of self-employment entry and self-employment survival. More specifically, it examines whether the potentially positive effect of risk propensity on the decision to become self-employed turns curvilinear when it comes to the survival of the business. Building on a longitudinal sample of 4,973 individuals from the SOEP, we used event history analyses to evaluate the influence of risk propensity on self-employment over a 7-year time period. Results indicated that while high levels of risk propensity positively predicted the decision to become self-employed, the relationship between risk propensity and self-employment survival followed an inverted U-shaped curve.

2.1 Introduction

The relevance of entrepreneurship to economic output and its employment potential justify the scholarly attention towards the antecedents and consequences of self-employment (Busenitz, West, Shepherd, Nelson, Chandler, & Zacharakis, 2003; Thomas & Mueller, 2000). Among these antecedents, entrepreneurs' personality is often associated with the probability of starting and continuing self-employment (Brandstätter, 1997; Rauch & Frese, 2007). The risky and often unpredictable nature of self-employment activities hints at a link between self-employment and individuals' propensity to take risks. Indeed, more than 250 years ago, Cantillon (1755) suggested that entrepreneurs show a higher degree of risk propensity. After decades of inconsistent results (Brockhaus & Horwitz, 1986; Chell, 1985; Perry, 1990; Schwer & Yucelt, 1984; Tucker, 1988), meta-analytic evidence suggested that

[2] This chapter is based on Nieß and Biemann (2014), published in the *Journal of Applied Psychology*, Advance online publication.

entrepreneurs indeed have a greater risk propensity than do other groups, such as managers (Stewart & Roth, 2001). The authors, however, acknowledged that the studies included in their meta-analysis may have suffered from a sample-selection bias against failed entrepreneurs. Other studies likewise have included samples of individuals who were already engaged in entrepreneurial activities at the time of data collection, thus suffering from a sample-selection bias against non-entrepreneurs (Carroll & Mosakowski, 1987). In addition to the frequent sample-selection biases, much of the research investigating the role of risk propensity in self-employment has relied on cross-sectional rather than longitudinal data. Based on the existing literature, it is therefore neither possible to draw causal inferences nor to determine whether risk propensity is associated with the occupational choice of becoming self-employed or with remaining in that occupation.

The present study thus aims to untangle the potentially different mechanisms by which risk propensity predicts self-employment entry on the one hand and self-employment survival on the other. First, it investigates whether high levels of risk propensity facilitate the decision to become self-employed. Although the role of risk propensity in predicting self-employment entry has already evoked much empirical research, we base our analyses on a large dataset collected over time, which allows drawing more confident conclusions in terms of the causal effect of risk propensity on the decision to become self-employed. Second, the present study extends prior research by examining whether a *too-much-of-a-good-thing (TMGT) effect* (Grant & Schwartz, 2011; Pierce & Aguinis, 2013) occurs with respect to the effect of risk propensity on self-employment survival. A growing body of literature in diverse contexts is concerned with the meta-theoretical principle of the TMGT effect (Le, Oh, Robbins, Ilies, Holland, & Westrick, 2011; Rubin, Dierdorff, & Bachrach, 2013), which suggests that an initially beneficial predictor variable reaches an inflection point after which its relationship to the outcome becomes negative (Pierce & Aguinis, 2013). The proposition

of an inverted U-shaped relationship between risk propensity and venture survival may help to explain the initially inconsistent results found for the risk propensity of entrepreneurs. By applying event history analyses to a large longitudinal dataset, the present study allows investigating the effects of risk propensity on both self-employment entry and self-employment survival, thereby overcoming the methodological limitations for which previous studies have been criticized (Stewart & Roth, 2001). This approach offers a novel perspective on the linkages between risk propensity and self-employment entry as well as self-employment survival, providing a more stringent investigation of the causal nature underlying those linkages as well as a potential explanation of the previously inconsistent findings pertaining to the role of risk propensity in self-employment.

The present study is structured as follows. In the following section, we will develop our hypotheses concerning the relationships between risk propensity and self-employment entry as well as between risk propensity and self-employment survival. We continue by describing our research methodology before turning to the results of our analyses. In the final section, we will describe the contributions and limitations of our study and outline possible avenues for further research.

2.2 Theory

2.2.1 The Impact of Risk Propensity on Self-Employment Entry

Due to its relevance to economic output, scholars have spent decades identifying potential antecedents of self-employment (Blanchflower, 2000; Busenitz et al., 2003; Chell, 1985), which is defined as “working for oneself as a freelance or the owner of a business rather than for an employer” (Self-Employment, 2011). While microeconomic research has generally focused on economic predictors of self-employment such as financial capital (Evans & Jovanovic, 1989) or the previous employment situation (Ritsilä & Tervo, 2002), much of the psychological research has investigated the role of human capital (Unger, Rauch,

Frese, & Rosenbusch, 2011) and especially personality in self-employment (Rauch & Frese, 2007).

Several psychological theories, such as the theory of vocational choice (Holland, 1959), person-environment fit theory (Caplan, 1987; Sims, 1983), and the attraction-selection-attrition model (Schneider, 1987), support the notion that personality may be related to individuals' occupational choice. According to these theories, people specifically choose jobs and work environments that match their personalities. Since self-employment is perceived as a risky occupation by scholars and laypeople alike (Baron, 1999), it is reasonable to assume that risk propensity, which is defined as "the tendency of a decision maker either to take or to avoid risks" (Sitkin & Pablo, 1992, p. 12), predicts self-selection into self-employment.

In the very early works of Cantillon (1755), entrepreneurs are already described as risk bearers. Self-employment more specifically requires dealing with a highly uncertain set of possibilities (Bearse, 1982) and taking full responsibility for decisions (Gasse, 1982). It involves accepting uncertainty regarding the demand for the products the self-employed produce (Appelbaum & Katz, 1986), the cost uncertainty in the production function (Kanbur, 1979), and a large variability in earnings (Hamilton, 2000). Self-employment thus indeed constitutes a rather risky occupation, so according to theoretical considerations, risk-tolerant individuals are likely to self-select into this occupation.

Not only theoretical contemplations, but also a body of research links risk propensity to self-employment (Cramer, Hartog, Jonker, & Van Praag, 2002; Van Praag & Cramer, 2001; Zacher, Biemann, Gielnik, & Frese, 2012). Those studies have generally found that the self-employed have a greater risk propensity than other groups (Hartog, Ferrer-i Carbonell, & Jonker, 2002; Stewart & Roth, 2001). Caliendo, Fossen, and Kritikos (2009) more specifically investigated the decision to become self-employed and postulated that the

decision is influenced by individuals´ risk propensity, however measuring both variables at the same point in time. Much of the existing literature thus contains the underlying assumption that risk propensity is a causal predictor of self-employment entry. Based on the mostly cross-sectional data, it is, however, difficult to draw confident conclusions regarding the role of risk propensity as an antecedent of the decision to become self-employed. We propose:

Hypothesis 1: Risk propensity predicts self-employment entry.

2.2.2 The Impact of Risk Propensity on Self-Employment Survival

While the theory underlying the association between risk propensity and the decision to become self-employed is straightforward, the relationship between risk taking and self-employment survival is less clear. Based on the existing literature, there is reason to assume that the interplay between risk taking and venture survival is more complex than a monotonic positive relationship would suggest.

On the one hand, there is reason to assume that a greater risk propensity leads to self-employment survival. Meta-analyses investigating person-environment fit theory have suggested that when there is a positive fit between individuals and the jobs they work in, they are more likely to remain in the occupation (Kristof-Brown, Zimmerman, & Johnson, 2005; Verquer, Beehr, & Wagner, 2003). Applied to the context of personality and self-employment, this would suggest that individuals are more likely to remain self-employed when their personality matches the occupation (Hmieleski & Baron, 2008). Building on the argument that the entrepreneurial role is a rather risky one, risk-tolerant individuals should thus be more likely to endure in the role of a self-employed. Furthermore, many of the studies linking risk propensity to self-employment have suffered from sample selection biases by excluding either non-entrepreneurs (Carroll & Mosakowski, 1987) or self-employment failures (Stewart & Roth, 2001). Those studies therefore predominantly include self-

employed individuals who have stayed in business for a considerable amount of time. Those individuals who never become self-employed or give up their newly established business quickly are less likely to be included in those studies. It can thus be assumed that much of the literature concerned with the effect of risk propensity on self-employment has really investigated mainly self-employment survival, thus suffering from survivorship bias.

On the other hand, scholars have also suggested that risk taking has a rather small or possibly even a detrimental effect on self-employment survival (Rauch & Frese, 2007). According to theoretical considerations, entrepreneurs who have a moderate rather than high risk propensity (Meredith, Nelson, & Neck, 1982) and who take well-calculated risks (Timmons, 1989) will be more successful in the long run. Furthermore, Brockhaus (1980) suggested that individuals with high levels of risk taking may fail in self-employment at a greater rate than those with a moderate risk propensity, which is supported by the finding that very high levels of risk taking have a negative effect on entrepreneurial survival (Begley & Boyd, 1987). Self-employed individuals with a very low risk propensity who are reluctant to assume "the accompanying financial, psychic, and social risks" (Hisrich, 1990, p. 209) may, however, likewise have to give up their business because they fail to deal with the unstructured and uncertain set of tasks and possibilities (Bearse, 1982; Hmieleski & Baron, 2009).

This conflicting evidence concerning the effect of risk propensity on self-employment survival leads to the conclusion that the relationship between risk taking and staying in business may not be linear. According to the TMGT effect (Grant & Schwartz, 2011), any seemingly beneficial predictor may reach an inflection point after which the relationship between that predictor and the outcome turns negative. This inverted U-shaped pattern of curvilinearity has recently received much scholarly attention and applies to a number of relationships, such as between personality traits and job performance (Le et al., 2011) and

between citizenship behavior and task performance (Rubin et al., 2013). The TMGT effect may also apply in the case of risk propensity as a possible predictor of self-employment survival. Risk propensity may serve as a positive predictor of self-employment survival up to an inflection point after which its effect turns negative. Both theoretical considerations and empirical evidence indeed suggest that while extremely low and extremely high levels of risk propensity may be detrimental to self-employment survival, taking well-calculated risks at a moderate level is a defining characteristic of successful self-employment (Brockhaus, 1980; Caliendo, Fossen, & Kritikos, 2010; Meredith et al., 1982; Timmons, 1989). We, however, know of no study which has investigated this potentially curvilinear relation based on longitudinal data where the independent variables was assessed prior to the dependent variable, which could support the notion that risk propensity predicts self-employment survival rather than the other way around. We therefore suggest:

Hypothesis 2: There will be an inverted U-shaped relationship between risk propensity and self-employment survival.

2.3 Method

2.3.1 Sample

We used data from the SOEP, a representative longitudinal survey of the adult population living in private households in Germany (Wagner, Frick, & Schupp, 2007). The survey has been conducted annually since 1984 and includes a sample size of roughly 20,000 individuals each year. The SOEP provides a number of advantages for answering the research questions addressed in this study. First, due to its longitudinal structure, it is possible to investigate the effect of risk propensity on *subsequent* self-employment entry and survival rather than measuring both variables at the same point in time. Second, the SOEP data overcome the sample-selection bias for which previous studies have been criticized (Stewart & Roth, 2001) because employees and self-employed individuals who have stayed in

business as well as those who have failed are interviewed repeatedly in each wave. Third, using the SOEP allows controlling for a large number of other variables that may influence the relationships proposed between the variables of interest. The use of data from the 2004 – 2010 SOEP waves, which were chosen because data on risk propensity were available in 2004 for the first time, resulted in a sample of 4,973 individuals, 2,772 males and 2,201 females. The mean age of the sample was 42.43 (*SD* = 8.87) in 2004.

2.3.2 Measures

For the purpose of this study, we extracted variables of the years 2004 through 2010 from the SOEP. The 2004 wave was chosen as the starting point because risk propensity was operationalized for the first time in that wave. Waves 2005 through 2010 were used to operationalize self-employment entry and self-employment survival during the subsequent years. The resulting data are therefore longitudinal and allow investigating the effect of risk propensity assessed in 2004 on subsequent self-employment entry and survival in waves 2005 through 2010. The syntax for extracting the variables from the SOEP can be obtained from the authors upon request.

Risk propensity. The SOEP included an indicator of the respondents' general willingness to take risks, which was answered on an 11-point Likert scale ranging from 0 (*very unwilling to take risks*) to 10 (*very willing to take risks*). It furthermore asked for participants' risk propensity in specific contexts, such as while driving, in financial matters, during leisure and sport, in their occupation, with their health, and their faith in other people. Answers again ranged from 0 (*very unwilling to take risks*) to 10 (*very willing to take risks*) on an 11-point Likert scale. Dohmen, Falk, Huffman, Sunde, Schupp, and Wagner (2005) tested the behavioral relevance of the risk propensity indicators in a field experiment based on a sample of 450 subjects. They found that the general question was a good predictor of actual risk-taking behavior in several different contexts. Since single-item measures have

furthermore been found to be reliable measures of the respective psychological constructs (Wanous, Reichers, & Hudy, 1997) and personality traits (Woods & Hampson, 2005) in similar settings, we decided to operationalize risk propensity as a single item measure based on this general question. We, however, furthermore conducted robustness checks based on a multi-item scale of risk propensity. More particularly, we constructed a scale consisting of the general item as well as the two specific items that are especially relevant in the entrepreneurial context, namely risk propensity in financial investments and in the occupation. With a Cronbach's alpha of α = .76, the scale was of adequate internal consistency. The results of a confirmatory factor analysis furthermore revealed that the three items loaded with factor loading of .85 (general risk), .78 (risk in financial investments), and .84 (risk in occupation) on the latent factor risk propensity. The multi-items scale was thus of acceptable psychometric quality and therefore used for robustness analyses as an alternative operationalization of risk propensity.

Self-employment entry. Participants in this study were coded as self-employment entries if they reported having changed their occupational status to self-employment in waves 2005 through 2010. If they reported having stayed employed between 2005 and 2010, they were coded as employees (thereby excluding unemployed individuals, pensioners, and those in education or training). This resulted in a sample of 141 self-employment entries and 4,275 employees in the SOEP waves of 2005 through 2010.

Self-employment survival. To operationalize self-employment survival, we included individuals who were already self-employed in wave 2004 as well as those who entered self-employment in waves 2005 through 2010 in the analyses. Self-employment was coded as a survival if the self-employment was not given up in waves 2005 through 2009. If individuals reported having received financial compensation for giving up their self-employment, this was coded as a survival rather than a failure of the self-employment because the financial

compensation was used as a measure for having sold the business. However, if self-employed individuals reported having given up their business in the time frame of 2005 through 2009 without having received financial compensation, this was coded as self-employment failure. This process resulted in a sample of 524 survivals of self-employment and 160 failures of self-employment in the SOEP waves of 2005 through 2010.

Control variables. Three sets of variables are controlled for in this study. The first set includes demographics such as age, gender, nationality, marital status, and educational level. We used the variable year of birth in the SOEP to indicate age since age is related to self-employment (Blanchflower, Oswald, & Stutzer, 2001; Lévesque & Minniti, 2006). Gender was coded female (1) or male (0) and included because males are more likely to become self-employed than females (Acs, Arenius, Michael, & Minniti, 2005). Participants' nationality was coded as either German (1) or non-German (0) and included because business formation has been found to be conditional on an individual´s nationality (Shane & Kolvereid, 1991). We measured marital status as a dichotomous variable, with the not married category (0) including individuals who were separated, single, divorced, or widowed in 2004. Marital status was included as a control variable because self-employment is significantly higher for married individuals (Lindh & Ohlsson, 1996). Educational level was coded ranging from no school degree to an upper secondary degree because education has been found to be one of the main predictors of self-employment (Delmar & Davidsson, 2000).

The second set of control variables refers to the occupational situation of the participants in 2004. Since unemployment may act as a push factor for self-employment (Wennekers, van Stel, Thurik, & Reynolds, 2005), participants' time spent in employment (M = 16.49, SD = 10.40) and in unemployment (M = .39, SD = 1.12) up to wave 2004 was included as a control. We furthermore included a measure of participants' job satisfaction ranging from 0 (*very unsatisfied*) to 10 (*very satisfied*) as another indicator of their

occupational situation in 2004 because low job satisfaction may drive entrepreneurial aspirations (Henley, 2005).

A third variable set controlled for participants' financial situation in 2004. It included the net labor income as well as the number of all assets, such as savings accounts, fixed interest securities, or operating assets, owned in 2004. Financial resources and constraints have been found to influence the decision to become self-employed (Evans & Jovanovic, 1989).

2.3.3 Statistical Analyses

Before conducting our analyses, we used multiple imputation, a statistical procedure where several imputations (in this case m = 10 imputations) are generated for each missing data point. Since we only included cases for whom employment information was present for waves 2005 through 2010 in the dataset, imputation of the dependent variable was not necessary. The multiple imputation procedure results in analyses that avoid invalid statistical inferences due to missing data (Fichman & Cummings, 2003; Graham, 2009). We used linear regression to impute continuous variables and logistic regression to impute categorical variables to estimate 10 datasets. All analyses reported below were performed on each of the 10 datasets. Estimates were combined using an algorithm based on Rubin's (1987) rules. The percentage of missing data ranged from 0 % to 6.8 % (income being an exception with 19.1 %). We furthermore centered the continuous independent variables on their means, which is a necessary approach to ensure interpretability of coefficients, especially when testing curvilinear relationships (Jagodzinski & Weede, 1981). This procedure leaves significance levels and coefficients of determination unchanged (Bradley & Srivastava, 1979).

The analytic strategy investigating the influence of risk propensity on self-employment made use of event history analyses, more particularly of Cox regression hazard rate models (Cox & Oakes, 1984), for testing both hypotheses. Event history analyses not

only estimate whether an event occurred or not, but also take into consideration the time it took for the event to occur. This analytical approach thus treats self-employment entry and self-employment survival as time-dependent variables rather than as binary variables only, as is the case with binary logistic regression. Furthermore, event history analyses have the potential of accounting for censored data. The observation period of the present study ended after the wave of 2010, but it is possible that the events of interest (self-employment entry and self-employment failure) occurred after that point in time. The data used in this study are therefore right-censored, a fact that survival models can account for.[3]

2.4 Results

Table 2.1 includes the means and standard deviations of the studied variables as well as their correlations.

[3] Both hypotheses have furthermore been tested with logistic regression analyses. Results from those logistic regression analyses strongly resemble the results obtained on the basis of the event history analyses, reported in the Results section of this article.

Table 2.1: Means, Standard Deviations, and Correlations among the Studied Variables

Variable		*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1	Risk propensity (0 – 10)	4.77	2.17												
2	Self-Employment Entry[a] (1 = yes)	.03	.18	.06***											
3	Self-Employment Survival[b] (1 = yes)	.76	.42	-.01	- - -										
4	Age	42.43	8.87	-.03*	-.05***	.11**									
5	Gender (1 = female)	.44	.50	-.20***	-.06***	-.04	.00								
6	German nationality (1 = yes)	.95	.21	.02	.01	.02	.06***	.02							
7	Married (1 = yes)	.68	.50	-.08***	-.04*	-.02	.31***	-.02	.04**						
8	Educational level (0 – 4)	2.39	.21	.07***	.06***	.02	-.01	.00	-.06***	-.06***					
9	Time employed	16.34	9.97	.07***	-.05**	.15***	.71***	-.32***	-.04**	.19***	-.15***				
10	Time unemployed	.36	1.02	-.04*	-.01	-.07	.01	.08***	.04**	-.02	-.08***	-.10***			
11	Job satisfaction (0 – 10)	7.17	1.86	.07***	.00	.02	.00	.00	-.01	.02	.05**	-.01	-.04**		
12	Income (in €uro)	2771.57	1776.21	.17***	.05***	.06	.19***	-.37***	-.06***	.07***	.30***	.31***	-.17***	.10***	
13	Assets (0 – 6)	3.00	1.16	.03*	.01	.11**	.06***	-.03*	-.10***	.15***	.13***	.02	-.10***	.03*	.19***

Note. N = 4,973 . [a]N = 4,416. [b]N = 684.
* $p < .05$. ** $p < .01$. *** $p < .001$.

2.4.1 The Impact of Risk Propensity on Self-Employment Entry

Hypothesis 1 states that risk propensity predicts self-employment entry, which was tested using a Cox regression hazard rate model. The three sets of control variables (demographics, employment situation, and financial situation) were entered into the model in a first step. In a second step, risk propensity was added to estimate its effect on the outcome. Self-employment entry (1 = self-employed, 0 = employed) was included as the categorical dependent variable. The time until the event of self-employment entry occurred was entered as the time variable, so that its effect was accounted for in the analysis. The results of the event history analysis can be found in Table 2.2 and show that risk propensity significantly predicted self-employment entry (B = .29, p = .002) when controlling for a large number of variables and the time it took for self-employment to occur. The odds ratios furthermore suggest that when risk propensity was one standard deviation above the mean, the odds of becoming self-employed increased by 33 %.

Table 2.2: Cox Regression Hazard Rate Model Predicting Self-Employment Entry

	Step 1 (control variables)			Step 2 (risk propensity)		
	B	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*
Age	.01	.14	1.01	.03	.14	1.03
Gender	-.80***	.21	.45	-.71**	.21	.49
German nationality	-.03	.42	.97	-.02	.42	.98
Married	-.22	.19	.81	-.17	.19	.85
Educational level	.21*	.10	1.23	.20*	.10	1.22
Time employed	-.42**	.16	.66	-.43**	.16	.65
Time unemployed	.01	.10	1.01	.01	.10	1.01
Job satisfaction	-.05	.09	.95	-.07	.09	.93
Income	.13	.08	1.14	.11	.08	1.11
Assets	.02	.09	1.02	.02	.09	1.02
Risk propensity				.29**	.09	1.33

Note. N = 4,416.
* p < .05. ** p < .01. *** p < .001.

The results of Hypothesis 1 are displayed in Figure 2.1, which shows that individuals with a high risk propensity are especially likely to become self-employed, while individuals with a medium or a low risk propensity are considerably less likely to start their own

business. Figure 2.1 furthermore displays that medium and low levels of risk propensity lead to similarly low levels of self-employment entry, suggesting that the effect of risk propensity on self-employment entry is mainly driven by high levels of risk propensity.

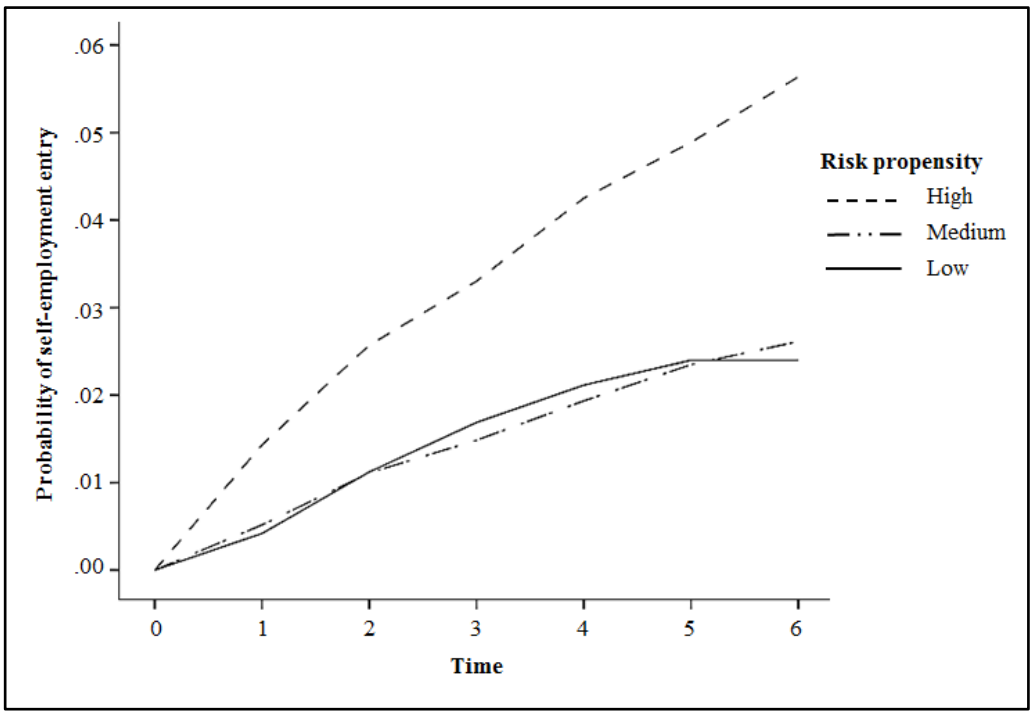

Figure 2.1: Probability of self-employment entry for high risk propensity (> 1 SD above mean), medium risk propensity (mean +/- 1 SD), and low risk propensity (< 1 SD below mean) over 7 years.

The results of the Cox regression hazard model thus suggest that risk propensity positively predicts self-employment entry, therewith offering support for Hypothesis 1.

2.4.2 The Impact of Risk Propensity on Self-Employment Survival

To test Hypothesis 2, which states that there will be an inverted U-shaped relationship between risk propensity and self-employment survival, we again used a Cox regression hazard rate model. Since survival analysis accounts for the time it took for an event to occur, the dependent variable in this analysis was self-employment failure, not self-employment survival. This is the case because the variable of self-employment survival has no variance in terms of the time it took for the event to occur, since for subjects to be coded as self-employment survivors, they must have been self-employed until the wave of 2009. We therefore relied on the usual framework of survival analysis where survival is coded as 0,

while death (in this case self-employment failure) is coded as 1. The time it took for the self-employment failure to occur is different across subjects, so that it can be accounted for in the analysis. In summary, we thus made use of a Cox regression hazard rate model to test for a U-shaped relation between risk propensity and self-employment failure. The three sets of control variables (demographics, employment situation, and financial situation) were again entered into the model in a first step. In a second step, the linear term of risk propensity was added to estimate its effect on the outcome. The squared term of risk propensity was added to the model in a third step. Self-employment failure (1 = self-employment failure, 0 = self-employment survival) was included as the categorical dependent variable. The time until the event of self-employment failure occurred was entered as the time variable, so that its effect was accounted for in the analysis.

The results of the Cox regression hazard rate model can be found in Table 2.3. The linear term of risk propensity added in the second step of the model served as a positive, but non-significant predictor of self-employment failure. When the squared term of risk propensity was, however, added to the model in step 3, the squared term significantly and positively predicted self-employment failure (B = .13, p = .021). This finding offers support for a U-shaped relationship between risk propensity and self-employment failure, while at the same time it suggests an inverted U-shaped relationship between risk propensity and self-employment survival. The odds ratios suggest that with a squared risk propensity one standard deviation above the mean, the likelihood of self-employment failure increased by 14 % or, phrased differently, the likelihood of self-employment survival decreased by 14 %.

Table 2.3: Cox Regression Hazard Rate Model Predicting Self-Employment Failure

	Step 1 (control variables)			Step 2 (risk propensity)			Step 3 (squared risk propensity)		
	B	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*
Age	.06	.14	1.07	.06	.14	1.07	.06	.14	1.06
Gender	-.11	.21	.89	-.10	.21	.91	-.08	.21	.93
German nationality	-.03	.37	.97	-.04	.37	.96	-.06	.38	.94
Married	.30	.18	1.35	.32	.18	1..38	.32	.18	1.38
Educational level	-.11	.10	.90	-.10	.10	.90	-.08	.10	.92
Time employed	-.42**	.15	.66	-.42**	.15	.66	-.42**	.15	.66
Time unemployed	.02	.06	1.02	.03	.06	1.03	.00	.06	1.00
Job satisfaction	-.02	.08	.98	-.03	.08	.97	-.04	.08	.96
Income	.01	.12	.96	.00	.12	1.00	.01	.12	1.01
Assets	-.22**	.08	.81	-.22**	.08	.80	-.22**	.08	.80
Risk propensity				.05	.08	1.05	.01	.08	1.01
Squared risk propensity							.13*	.06	1.14

Note. $N = 684$.
* $p < .05$. ** $p < .01$.

Figure 2.2 displays the probability of self-employment for individuals with a high, medium, and low risk propensity over time. It suggests that individuals with a medium risk propensity are more likely to stay self-employed over time than individuals with a high or a low risk propensity.

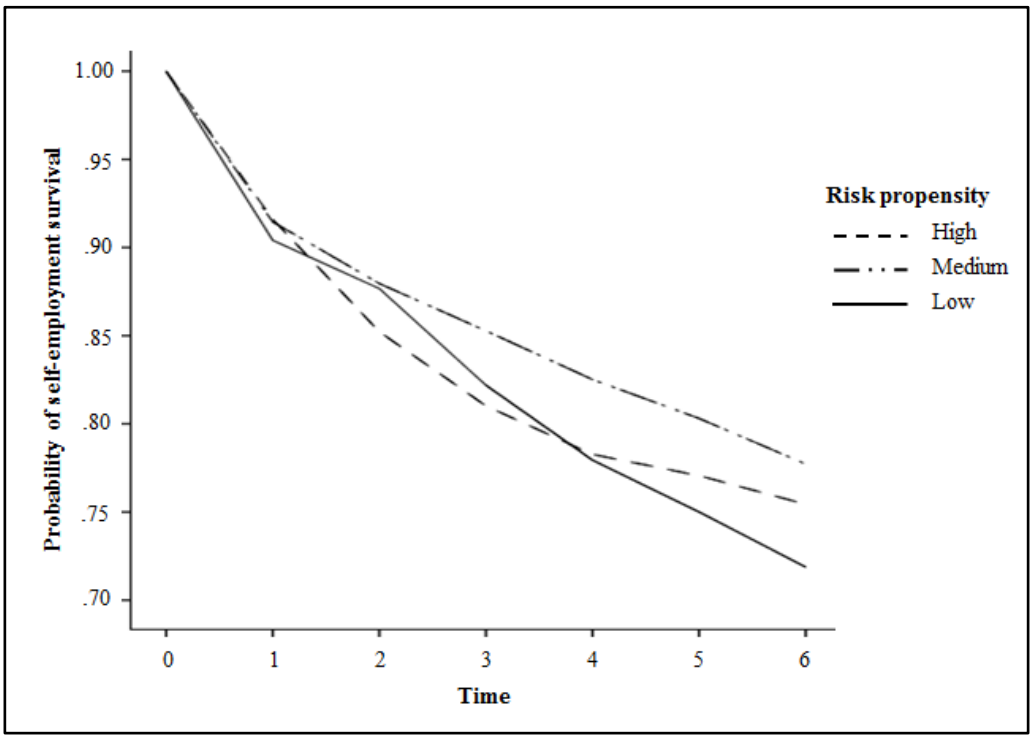

Figure 2.2: Probability of self-employment survival for high risk propensity (> 1 SD above mean), medium risk propensity (mean +/- 1 SD), and low risk propensity (< 1 SD below mean) over 7 years.

Figure 2.3 offers more support for this inverted U-shaped relationship between risk propensity and self-employment survival for the whole spectrum of risk propensity, ranging from 0 (*very unwilling to take risks*) to 10 (*very willing to take risks*). While extremely low and extremely high levels of risk propensity are detrimental for self-employment survival, individuals with medium levels of risk propensity are most likely to remain self-employed.

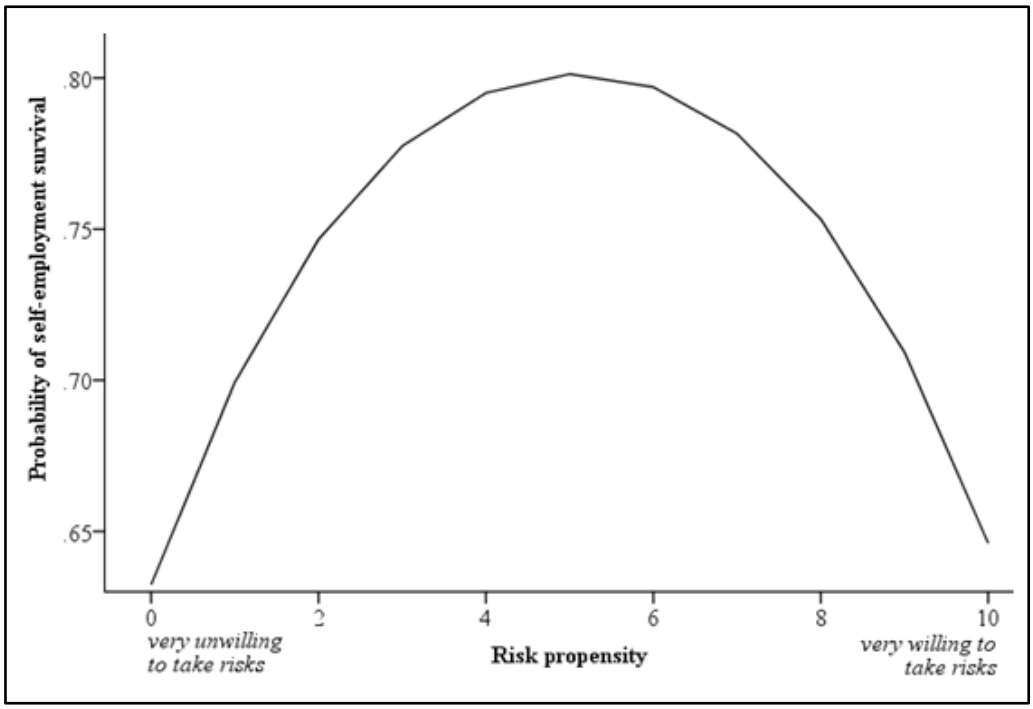

Figure 2.3: Probability of self-employment survival based on risk propensity and its squared term.

In sum, the Cox regression hazard rate model thus suggests that the relation between risk propensity and self-employment failure follows a U-shaped function, while the relation between risk propensity and self-employment survival follows an inverted U-shaped function, thus offering support for Hypothesis 2.

2.4.3 Robustness Checks

As robustness checks, the analyses reported above were repeated with an alternative operationalization of the independent variable risk propensity. As described above, a multi-item scale of risk propensity was constructed based on the general and two context-specific questions included in the SOEP.

For robustness checks of Hypothesis 1, the Cox regression hazard rate model described above was conducted with the multi-item scale of risk propensity. Results offer support for Hypothesis 1, showing that the multi-item scale of risk propensity predicted self-employment entry (B = .33, p < .001). The odds ratios of the event history analysis suggest

that a standard deviation increase in risk propensity leads to a 39 % increase in the probability of self-employment entry.

As a robustness check of Hypothesis 2, the Cox regression hazard rate model was also repeated with the multi-item scale of risk propensity. Results suggest that while the linear term of risk propensity served as a non-significant predictor of failure, the squared term positively and significantly predicted self-employment failure (B = .12, p = .036). The odds ratios show that a squared risk propensity score of one standard deviation above the average raises the probability to fail as an entrepreneur by 13 %. The robustness check for Hypothesis 2 thus supports the initial findings, suggesting that individuals are most likely to survive as entrepreneurs at moderate levels of risk propensity, while failure is more likely at extreme levels of risk propensity.

2.5 Discussion

The aim of the present study was to shed more light on the relationship between risk propensity and self-employment. On the one hand, we investigated whether risk propensity served as a predictor of the decision to become self-employed. On the other hand, we examined whether the relationship between risk propensity and self-employment survival followed an inverted U-shaped rather than being a linear function.

Theoretical considerations based on the theory of vocational choice (Holland, 1959), person-environment fit theory (Caplan, 1987; Sims, 1983), and the attraction-selection-attrition model (Schneider, 1987) have suggested that people choose work environments that match their personalities. Since self-employment is regarded as a rather risky occupation, individuals may self-select into self-employment based on their risk propensity. Many of the previous studies investigating the association between risk propensity and self-employment have not made a deliberate distinction between the decision to become self-employed and self-employment survival. Based on the methodological approach of comparing entrepreneurs

to other groups, such as managers (Stewart & Roth, 2001) or employees (Van Praag & Cramer, 2001), it was impossible to conclude whether risk propensity is associated with the occupational choice of becoming self-employed or with surviving in that occupation. Consistent with the findings of Caliendo et al. (2009), the present study suggests that risk propensity serves as a predictor of the decision to become self-employed. We can, however, draw more confident conclusions concerning the causal nature of this relationship because we measured risk propensity prior to entry into self-employment.

Based on studies reporting that entrepreneurs generally have a greater risk propensity than other groups (Stewart & Roth, 2001; Van Praag & Cramer, 2001), one could have concluded that higher levels of risk propensity likewise predict self-employment survival. According to person-environment fit theory (Caplan, 1987; Sims, 1983), one could further assume that self-employed individuals with a greater risk propensity remain in the occupation. On the other hand, scholars have also suggested that entrepreneurs with a high risk propensity are more likely to fail (Brockhaus, 1980; Meredith et al., 1982; Timmons, 1989). While other research on the effects of individual attributes on persistence in self-employment has suggested that personality traits have the same linear effects on both self-employment entry and self-employment survival (Patel & Thatcher, 2012), the present study offers evidence for the TMGT effect (Grant & Schwartz, 2011). Concerning the role of risk propensity in self-employment survival, it thereby provides an explanation for the contrary propositions in the literature. Our results suggest that when comparing self-employed individuals who have stayed in business to those who have failed, the relationship between risk propensity and self-employment survival follows an inverted U-shaped pattern. While very low and very high levels of risk seemed to be detrimental to remaining self-employed, individuals with a moderate risk propensity had higher chances of staying in business. Thus, there seemed to be an inflection point after which the previously positive effect of risk

propensity on self-employment survival became negative. By investigating the effects of risk propensity in both self-employment entry and self-employment survival, this study extends prior research and allows drawing more precise conclusions concerning the role of risk propensity in self-employment.

2.5.1 Practical Implications

There are two main practical implications of our findings. First, the effects of risk propensity on self-employment entry and self-employment survival can be used for career counseling. While high levels of risk taking are associated with the decision to start a business, a moderate risk propensity seems to predict successful self-employment. This may be because individuals with a high risk propensity are more likely to start a business, even with a not very promising idea, and make decisions that are too risky (Hmieleski & Baron, 2009). More risk-averse individuals, on the other hand, may only decide on the occupational change into self-employment with a very promising idea. Career counselors could therefore emphasize the magnitude of this personality trait when advising individuals whether or not to pursue a career in self-employment.

Second, the results of this research may be relevant to government organizations interested in promoting and sustaining self-employment. The results of our study suggest that moderate risk takers are more likely to persist in self-employment than people with extremely high or low levels of risk propensity. Government organizations supporting individuals in becoming self-employed may try to focus on programs that lead individuals to achieve the most promising level of risk taking. Training that focuses on acquiring moderate levels of risk propensity may be a possibility for promoting nascent entrepreneurs who then have higher chances of surviving in business.

2.5.2 Limitations and Avenues for Future Research

This study is not without limitations, which, however, reveal fruitful avenues for future research. First, although we based our analyses on a large, representative database, the sample included only German respondents. This limits the generalizability of the findings to the larger world population. Second, since the SOEP makes use of a predefined set of questions, the operationalization of the variables of interest and the inclusion of control variables were limited to those questions. This makes it possible for an omitted variable bias to occur, since the observed associations between risk propensity and self-employment could be driven by an omitted factor which is related to both of those variables. Future research could aim to replicate the present findings with a validated multi-item scale measuring risk propensity and investigate whether there are further factors that may drive the relationships between risk propensity and self-employment. Especially other individual characteristics, skills, and abilities may foster the decision to become self-employed and affect venture survival, which has already been studied (Patel & Thatcher, 2012) and could be further investigated in future research. Third, although the data were longitudinal and the independent variable of risk propensity precedes the measurement of the dependent variables of self-employment entry and survival, causality cannot be proven. Due to the chronological measurement of the variables, the elimination of survivor biases, and the fact that risk propensity has been shown to be predispositional (Jackson et al., 1972), the effects obtained are most likely to be of a causal nature. Given the present research question, it is furthermore difficult to think of a potential experimental design that would be ethical to implement. It is, however, possible that there are feedback processes between risk propensity and self-employment that we have not modeled in the present paper. A high risk propensity may for example lead to success in self-employment in some cases, which could in turn lead to a higher subsequent risk propensity for those individuals and again predict risky decision-

making. Future research could focus on examining this potential interplay between risk propensity and self-employment. Fourth, our findings suggest that while high risk taking predicts the decision to become self-employed, moderate levels of risk propensity lead to self-employment survival. More research is needed to investigate the processes by which different levels of risk propensity lead to self-employment entry on the one hand and self-employment survival on the other. This may include controlling for the quality of the idea that individuals decide to pursue in becoming self-employed.

2.6 Conclusion

The present study investigates the relationship between risk propensity and self-employment. While high levels of risk taking predict self-employment entry, a moderate risk taking propensity rather than very high or low levels seems to forecast self-employment survival. Our findings thus suggest that different magnitudes of risk taking are associated with the decision to start a business and with succeeding in that occupation.

3 The Role of Risk Propensity in Self-Employment: A Replication and Extension

The present study replicates and extends work of Nieß and Biemann (2014) by shedding light on the association between risk propensity and self-employment. First, it examines whether the finding that different levels of risk propensity predict self-employment entry on the one hand and self-employment survival on the other hand generalizes from a German to an Australian sample. Second, it investigates whether self-employment entry also has the potential of evoking changes in entrepreneurs' willingness to take risks. Making use of a sample of 4,013 respondents from the HILDA survey, survival analyses revealed that risk propensity positively predicted self-employment entry, while there was no statistically significant effect on venture survival. The graphical representations of the results, however, hint towards a curvilinear relationship between risk-taking and self-employment survival, advocating that particularly low levels of risk propensity are detrimental for venture survival. Propensity score matching and subsequent linear regression analyses furthermore suggested that the decision to become self-employed leads to an increase in subsequent willingness to take risks. The results thus offer support for the notion that personality traits may not only serve as predictors, but also as outcomes of work-related experiences.

3.1 Introduction

The question of whether or not individuals' willingness to take risks affects their decision to become self-employed and persist as entrepreneurs has engaged scholars for over 250 years. While a positive relationship between risk taking and self-employment *entry* is now fairly well established (Rauch & Frese, 2007; Stewart & Roth, 2001), the role of entrepreneurs' risk propensity in predicting business *survival* is not as well-understood. Although several authors have suggested that extremely high or low levels of risk taking may be detrimental to venture survival (Bearse, 1982; Begley & Boyd, 1987; Brockhaus, 1980; Hisrich, 1990; Hmieleski & Baron, 2009) and that entrepreneurs should take moderate, well-

calculated risks (Meredith et al., 1982; Timmons, 1989), this intuition has rarely been put to an empirical test. In a recent study, Nieß and Biemann (2014) found that while risk propensity positively predicted the decision to become self-employed, the relationship between respondents' willingness to take risks and venture survival indeed followed an inverted U-shaped curve. Based on a longitudinal sample from the SOEP, the authors thus found empirical support for the notion that the positive effect of risk propensity on self-employment survival reaches an inflection point after which the relationship becomes negative. Since all analyses were carried out on a German sample, those findings, however, cannot be applied to a larger part of the world population. The first goal of the present study is therefore to replicate the study of Nieß and Biemann (2014) on the basis of a representative Australian sample and investigate whether different levels of risk propensity predict self-employment entry on the one hand and self-employment survival on the other hand.

Previous studies concerned with the association between risk propensity and self-employment have commonly relied on comparisons between entrepreneurs and other groups in terms of their willingness to take risks (Stewart & Roth, 2001). The underlying assumption inherent in such comparisons is that personality traits, such as risk propensity, are relatively stable over time (Jackson et al., 1972; McCrae et al., 2000) and must therefore predict self-employment rather than the other way around. Recent empirical findings, however, suggest that life events such as work experiences can have an effect on personality development (Jackson et al., 2012; Li et al., 2014; Wille & De Fruyt, 2014; Woods et al., 2013). Such potential reciprocal influences between risk propensity and self-employment are, however, yet to be determined. Risk tolerant individuals may well favor self-employment, but experiences in self-employment could also enhance the propensity to take risks. Although Nieß and Biemann (2014) base their analyses on a longitudinal sample, the reciprocal effect of self-employment on subsequent risk propensity is not considered. The authors, however,

suggest that "future research could focus on examining this potential interplay between risk propensity and self-employment" (Nieß & Biemann, 2014, p. 8). The second goal of the present study is thus to extend the work of Nieß and Biemann (2014) by investigating whether self-employment entry has the potential of evoking changes in individuals' willingness to take risks.

The present study is structured as follows. In the following section, I will develop three hypotheses concerning the reciprocal relationships between risk propensity and self-employment. After that, the research methodology will be described and the results of the analyses will be presented. In the final section, I will discuss the results and contributions as well as the study's limitations and address avenues for future research.

3.2 Theory

3.2.1 The Impact of Risk Propensity on Self-Employment Entry

After Cantillon (1755) had introduced his conception of entrepreneurs as risk-bearers in the 18th century, a controversial discussion about the role of personality traits in explaining self-employment evolved. By the 1980s, the lack of personality traits' cross-situational consistency (Mischel, 1968) and their low correlations with organizational outcomes (Guion & Gottier, 1965) led scholars to conclude that the personality approach to entrepreneurship could be neglected (Brockhaus & Horwitz, 1986; Chell, 1985). With a revival of researchers' interest in dispositional explanations for organizational behavior (Davis-Blake & Pfeffer, 1989), studies investigating personality traits as predictors of self-employment likewise reawakened. Based on meta-analytic findings, scholars then concluded that entrepreneurs indeed differ from other groups in terms of their personalities (Zhao & Seibert, 2006), and their willingness to take risks in particular (Stewart & Roth, 2001). Although those studies left hardly any doubt that risk propensity is indeed associated with self-employment, two important questions remained unanswered: First, studies comparing entrepreneurs to other

groups suffered from survivorship bias (Stewart & Roth, 2001), since they only included individuals who were self-employed at the time of data collection. Therefore, it is impossible to conclude whether risk propensity is linked to the decision to become self-employed or to successfully remaining self-employed. Second, the question of causality cannot be answered on the basis of cross-sectional comparisons.

Despite those methodological limitations, there is substantial reason to assume that risk propensity affects self-employment entry. According to renowned psychological theories, such as the theory of vocational choice (Holland, 1959), person-environment fit theory (Caplan, 1987; Sims, 1983), and the attraction-selection-attrition model (Schneider, 1987), individuals self-select into occupations that match their personalities. Since self-employment is considered a rather risky occupation (Baron, 1999), individuals with a high risk propensity may be more likely to become entrepreneurs than individuals with a low willingness to take risks. The notion that self-employment constitutes a risky vocation is supported by a body of literature, which suggests that "the rewards of entrepreneurship are more variable and less certain than the wages of employment" (Cramer et al., 2002, p. 29), and that entrepreneurs have to face uncertainties in the production function (Kanbur, 1979) and ambiguities concerning the demand for products they produce or the services they provide (Appelbaum & Katz, 1986). A majority of previous studies investigating the relationship between risk propensity and self-employment, however, do not allow drawing conclusions concerning the role of risk propensity on individuals' subsequent decision to become self-employed. This is due to the fact that studies have either made use of comparisons between entrepreneurs and other groups (Stewart & Roth, 2001) or did not assess individuals' willingness to take risks *prior* to their self-employment entry (Caliendo et al., 2009). In their recent study, Nieß and Biemann (2014) addressed this gap in the literature by applying survival analyses to a longitudinal German data set where the independent

variable risk propensity was measured prior to the dependent variable self-employment entry. In an attempt to replicate those findings in an Australian data set, I suggest:

Hypothesis 1: Risk propensity positively predicts self-employment entry.

3.2.2 The Impact of Risk Propensity on Self-Employment Survival

Since meta-analyses have found that entrepreneurs have a greater risk propensity than other groups (Stewart & Roth, 2001), one could assume that risk propensity is not only a positive predictor of self-employment entry, but also of self-employment survival. After all, individuals who have failed quickly as entrepreneurs are not included in those studies, so that they mainly rely on samples of successful entrepreneurs. According to Holland's (1959) theory of vocational choice, individuals indeed do not only self-select into work environments that match their personalities, but also find those environments most satisfying and are likely to remain in them. Individuals who have entered self-employment due to their high risk propensity may thus be especially likely to also persist in the occupation. This notion is supported by Wille, de Fruyt, and Feys (2010), who suggest that personality traits that lead individuals to choose an occupation are the same ones that predict their persistence in that vocation. Applied to the context of the present study, risk propensity should thus be positively related to both self-employment entry and self-employment survival.

Although some theoretical contemplations hint towards a positive effect of risk propensity on self-employment survival, scholars have also argued that individuals' willingness to take risks may be detrimental to venture survival. For example, riskier investments into the venture are also accompanied by the possibility of substantial losses, which in turn may lead to self-employment failure (Caliendo et al., 2010). At the same time, individuals who are not at all willing to take the "financial, psychic, and social risks" (Hisrich, 1990, p. 209) that are inherent in the occupation are also likely to fail as entrepreneurs.

Such seemingly contradictory arguments concerning the role of risk propensity in explaining self-employment survival suggest that the relationship between individuals' willingness to take risks and venture survival may be curvilinear. More specifically, empirical evidence suggests that entrepreneurs should be neither extremely risk-averse nor should they be overly willing to take risks. Rather, self-employment has been shown to be especially successful when entrepreneurs take moderate, well-calculated risks (Meredith et al., 1982; Timmons, 1989). While extremely low and extremely high levels of risk propensity should thus be detrimental for venture survival, a moderate willingness to take risks should positively predict self-employment survival. If this is indeed the case, the relationship between risk propensity and self-employment survival follows an inverted U-shaped curve, a pattern that is also known as the TMGT effect (Grant & Schwartz, 2011). According to this meta-theoretical principle, any initially positive predictor may reach an inflection point after which the effect on the outcome turns asymptotic or even negative. The TMGT effect has been found to apply to a number of questions addressed in the management literature (Pierce & Aguinis, 2013), such as the curvilinear relationship between conscientiousness and job performance (Tett, 1998; Whetzel, McDaniel, Yost, & Kim, 2010). In their recent study, Nieß and Biemann (2014) indeed found evidence for a TMGT effect of risk propensity on self-employment survival in a German sample. Applied to an Australian sample, I thus suggest:

Hypothesis 2: There will be an inverted U-shaped relationship between risk propensity and self-employment survival.

3.2.3 The Impact of Self-Employment Entry on Risk Propensity

Much of the empirical evidence linking risk propensity to self-employment relies on the assumption that personality traits, such as risk propensity, are stable over time (Lucas & Donnellan, 2011; West & Graziano, 1989), concluding that risk propensity must therefore predict entrepreneurship rather than the other way around. Personality traits have indeed been

defined as “endogenous dispositions that follow intrinsic paths of development essentially independent of environmental influences” (McCrae et al., 2000, p. 173) and risk propensity has been found to be predispositional (Jackson et al., 1972). Empirical findings, however, suggest that life experiences in the domain of work are associated with personality trait changes over time. For example, military training seems to shape agreeableness (Jackson et al., 2012), work characteristics have been found to affect employees’ proactive personality (Li et al., 2014), and occupational characteristics have an effect on the Big Five (Wille & De Fruyt, 2014). However, to the best of my knowledge no studies have investigated whether certain work experiences likewise have the potential of evoking changes in individuals’ willingness to take risks.

In the present study, it is suggested that self-employment may shape entrepreneurs’ risk propensity. According to social investment theory (Roberts et al., 2005), personality development takes place when individuals enter new social roles. This is attributed to the notion that individuals aim to meet the expectancies of those roles. For example, a person who decides to get married may try to fulfill the expectations of that role by becoming more agreeable. Occupational changes may similarly affect changes in individuals’ personalities, an argument that is supported by the finding that individuals tend to behave according to the norms that are associated with their work (Hogan & Roberts, 2000). Applied to the context of this study, individuals who have committed to the role of self-employment may likewise try to meet the expectations of that role. Since self-employment is commonly associated with risk taking, they may thus become more risk-seeking in response to their self-employment entry. Empirical evidence furthermore suggests that work experiences and personality traits are jointly responsive, showing that traits that lead individuals to self-select into specific work experiences may also be amplified following those experiences (Roberts et al., 2003). Building on the hypothesized role of risk propensity as a predictor of self-employment, it can

consequentially be assumed that the experiences made during self-employment likewise lead to changes in entrepreneurs' willingness to take risks. In sum, I propose:

Hypothesis 3: Self-employment entry positively predicts risk propensity.

3.3 Method

3.3.1 Sample

The sample of the present study was extracted from the HILDA survey. The HILDA is a representative panel study of Australia's population and has surveyed approximately 20,000 individuals each year since 2001. Given the longitudinal structure of the data set, the HILDA allows investigating the effect of risk propensity on *subsequent* self-employment entry and survival as well as vice versa, rather than measuring all variables at the same time point. This furthermore implies that initial levels of risk propensity can be accounted for when testing the effect of self-employment entry on respondents' subsequent willingness to take risks. Similar to the SOEP data that was used in the study by Nieß and Biemann (2014), the HILDA also does not suffer from sample selection bias and allows the inclusion of a large number of control variables. Data from waves 2004 – 2010 were extracted from the HILDA for statistical analyses to mirror the analytic approach of Nieß and Biemann (2014) as closely as possible. Only individuals for whom information on employment status was available in those waves were included in the analyses, resulting in a sample of 4,013 individuals of whom 2,264 were men and 1,749 were women. The mean age of the sample was 38.74 (*SD* = 11.55) in the wave of 2004.

3.3.2 Measures

With respect to the measures of the present study, the goal was again to mirror the analyses of Nieß and Biemann (2014). Therefore, data from waves 2004 through 2010 were extracted from the HILDA. More specifically, risk propensity was assessed in waves 2004 and 2010, while self-employment entry and survival were operationalized in waves 2005 –

2009. The resulting data are therefore longitudinal and allow investigating the effect of risk propensity assessed in 2004 on subsequent self-employment entry and survival in waves 2005 – 2009 as well as the effect of self-employment entry in those waves on subsequent risk propensity assessed in 2010.

Risk propensity. In the HILDA, risk propensity is assessed as respondents' willingness to take financial risks. More specifically, they are asked to indicate the degree to which they are prepared to take financial risks on a scale ranging from 1 (*takes substantial risks expecting substantial returns*) to 4 (*not willing to take financial risks*). Answers were reversed in their coding so that higher numbers would indicate a higher willingness to take risks.

Self-employment entry. Participants were coded as self-employment entries if they reported having changed their occupational status into self-employment at some point in time between waves 2005 and 2009. If they, however, reported having stayed employed in those waves, they were coded as employees. This procedure resulted in a sample of N = 342 self-employment entries and N = 3,035 employees.

Self-employment survival. Individuals who were already self-employed in wave 2004 as well as those who became self-employed between waves 2005 and 2009 were used to operationalize self-employment survival. If individuals remained self-employed until 2009, they were coded as self-employment survivals. If they, however, did not remain self-employed until the end of the observation period, they were coded as self-employment failures. The resulting sample consisted of N = 605 self-employment survivals and N = 299 self-employment failures.[4]

[4] This proportion equals a failure rate of 33.1 %, which is considerable higher than the 23.4 % failure rate obtained by Nieß and Biemann (2014). The number, however, mirrors similar findings from Australia, showing that almost one third of entrepreneurs exit self-employment each year (Atalay, Kim, & Whelan, 2013). Notably, the authors furthermore report that self-employment rates in Australia have decreased from 10.4 % in 2000 to 8.4 % in 2010, while they have increased in Germany from 7.9 % in 2000 to 8.4 % in 2010. Those numbers offer more support for the notion that self-employment exit rates may be higher in Australia than in Germany.

Control variables. In the present study, three sets of variables were controlled for. First, the set of demographic control variables included age, gender (1 = female; 0 = male), nationality (1 = Australian; 0 = not Australian), marital status (1 = married; 0 = not married, separated, divorced, or widowed), and educational level on a scale ranging from 1 (*year 11 of school and below*) to 9 (*postgraduate degree*). Second, control variables referring to the participants' occupational situation were controlled for. Those included the time they have ever spent in employment and in unemployment. Participants' previous job satisfaction, which was measured on a scale ranging from 0 (*totally dissatisfied*) to 10 *(totally satisfied*), was also included as a control variable of respondents' occupational situation. Third, participants' financial situation was also controlled for. This set of control variables included participants' yearly gross income and their household's net worth[5], which is calculated as the household's total assets minus its total debts.

3.3.3 Statistical Analyses

Before conducting the statistical analyses, multiple imputation (Fichman & Cummings, 2003) was used to treat missing data points, which ranged from 0 % to 5.2 %. The multiple imputation procedure performs regression analyses on the dataset to estimate the missing values several times, in our case m = 10 times. As a result, 10 separate data sets are estimated which include different but plausible values of the missing values. All analyses which are reported below were performed on each of those 10 data sets and estimates were then combined using an algorithm based on Rubin's (1987) rules. All continuous variables were furthermore centered on their means to ensure interpretability of coefficients, which is necessary especially when testing curvilinear relationships (Jagodzinski & Weede, 1981).

To test the proposed hypotheses, two analytical approaches were taken. First, for testing whether risk propensity predicts self-employment entry (Hypothesis 1) and self-

[5] Since this variable was not assessed in the wave of 2004, the value from the wave of 2002 was imputed to the wave of 2004.

employment survival (Hypothesis 2), Cox regression hazard rate models (Cox & Oakes, 1984) were used. This procedure does not only consider whether an event occurred or not, but also accounts for censored data and the time it took for the event to occur. Second, for testing whether self-employment entry predicts risk propensity (Hypothesis 3), propensity score matching (Connelly, Sackett, & Waters, 2013; Rosenbaum & Rubin, 1983) and subsequent linear regression analyses were used. Propensity score matching has already been used to investigate changes in personality traits in response to living arrangements (Jonkmann, Thoemmes, Lüdtke, & Trautwein, 2014). In the present study, the causal effect of group membership (self-employment entry versus no entry) on a personality trait (risk propensity) is likewise estimated on the basis of observational data, a situation for which propensity score matching has been suggested as the method of choice (Harder, Stuart, & Anthony, 2010). It aims at reducing the bias that results from the fact that participants cannot be randomly assigned to the two groups of self-employment entry versus no entry (Dehejia & Wahba, 2002) by pairing participants from those two groups in terms of certain pre-defined covariates. The control variables and initial levels of risk propensity served as covariates in the present study.

The MatchIt software package (Ho, Imai, King, & Stuart, 2011), which is based on the R project for statistical computing, was used to conduct the propensity score matching. In a first step, a propensity score, which is a measure of the likelihood of a person's group membership given the observed covariates, was estimated for each participant. In a second step, participants from both groups (self-employment entry versus no entry) were then matched using a 1:1 nearest neighbor matching with replacement. A caliper of .20 of the standard deviation of the propensity score's logit was imposed to avoid matches of very diverging propensity scores, which has been proposed as the optimal caliper width in propensity score matching (Austin, 2011). In a third step, the standardized mean differences

between the covariates after matching revealed that with none of the values above d = .20, the matching procedure improved the overall balance between the groups. The propensity score matching procedure resulted in a sample of N = 713 individuals, with N = 341 self-employment entries which were matched to N = 372 employees. Based on this matched sample, a linear regression analysis was then performed to estimate whether self-employment entry predicts subsequent levels of risk propensity.

3.4 Results

The means and standard deviations of the studied variables as well as their correlations can be found in Table 3.1.

Table 3.1: Means, Standard Deviations, and Correlations among the Studied Variables

Variable		*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Risk propensity 2004 (1 – 4)	1.77	.69													
2	Self-Employment Entry[a] (1 = yes)	.10	.30	.09***												
3	Self-Employment Survival[b] (1 = yes)	.67	.47	.08	- - -											
4	Risk propensity 2010 (1 – 4)	1.73	.67	.48***	.10***	.03										
5	Age	38.74	11.55	.04*	-.02	.14***	-.01									
6	Gender (1 = female)	.44	.50	-.17***	-.07***	-.15***	-.18***	.20								
7	Australian (1 = yes)	.81	.39	.00	-.03	-.04	-.03	-.14***	.01							
8	Married (1 = yes)	.69	.46	.08***	.05**	.07*	.07***	.30***	-.07***	-.10***						
9	Educational level (1 – 9)	4.43	2.62	.14***	.04*	.01	.14***	.11***	-.02	-.11***	.14***					
10	Time employed	19.26	11.29	.05**	-.01	.16***	-.01	.92***	-.12***	-.10***	.27***	.04*				
11	Time unemployed	.44	1.27	-.06**	-.01	-.08*	-.08***	-.02	-.02	-.04**	-.08***	-.13***	-.10***			
12	Job satisfaction (0 – 10)	8.70	3.87	-.04**	.00	.01	-.05**	.04**	.08***	.01	-.01	-.09***	.04*	.00		
13	Yearly Income (in A$)	46,433	38,093	.21***	.04*	.06	.20***	.23***	-.14***	-.06***	.18***	.30***	.23***	-.12***	-.01	
14	Household worth (in A$)	451,833	650,962	.16***	.00	.08*	.15***	.19***	-.01	.03	.05**	.08***	.19***	-.12***	.05*	.25***

Note. N = 4,013. [a] N = 3,377. [b] N = 904.
* $p < .05$. ** $p < .01$. *** $p < .001$.

3.4.1 The Impact of Risk Propensity on Self-Employment Entry

According to Hypothesis 1, risk propensity positively predicts self-employment entry. I made use of a Cox regression hazard rate model where the three sets of control variables (demographics, previous employment situation, and financial situation) were entered into the model in a first step. In a second step, risk propensity was added to the model as a predictor. Self-employment entry (1 = self-employment entry; 0 = employed) served as the dependent variable while the time until the event of self-employment entry occurred was used as the time variable.

The results of the Cox regression hazard rate model can be found in Table 3.2 and suggest that risk propensity indeed served as a significant positive predictor of self-employment entry (B = .22, p < .001) when controlling for several other variables and the time it took for the event to occur. The odds ratios show that with a risk propensity one standard deviation above the mean, the chances of self-employment entry increased by 25 %.

Table 3.2: Cox Regression Hazard Rate Model Predicting Self-Employment Entry

	Step 1 (control variables)			Step 2 (risk propensity)		
	B	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*
Age	-.13	.18	.88	-.14	.18	.87
Gender	-.38**	.13	.69	-.32*	.13	.73
Australian	-.22	.14	.80	-.21	.14	.81
Married	.32*	.13	1.38	.31*	.13	1.37
Educational level	.09	.06	1.09	.07	.06	1.07
Time employed	.00	.18	1.00	.02	.18	1.02
Time unemployed	-.02	.07	.99	-.01	.06	.99
Job satisfaction	.02	.06	1.02	.03	.06	1.03
Income	.04	.07	1.04	.01	.07	1.01
Household worth	.02	.07	1.03	-.01	.07	.99
Risk propensity				.22***	.06	1.25

Note. N = 4,013.
* p < .05. ** p < .01. *** p < .001.

Figure 3.1 furthermore offers a graphical representation of the effect of risk propensity on self-employment entry. Since risk propensity is measured on a 4-point Likert scale in the HILDA, Figure 3.1 shows the probability of self-employment entry for each of

those four values. The graphs indicate that individuals who are willing to take substantial or above-average risks are especially prone to becoming self-employed. Individuals who report that they take average or no risks are considerably less likely to enter self-employment. It should, however, be noted that the distribution of the sample across the four values of risk propensity was not balanced. A vast majority of the sample used for testing Hypothesis 1 reported that they are not willing to take risks (*N* = 1,125) or have an average risk propensity (*N* = 1,334). Much fewer respondents indicated that they take above-average (*N*= 247) or even substantial risks (*N* = 42). In sum, the results, however, offer support for Hypothesis 1 and suggest that risk propensity indeed positively predicts self-employment entry.

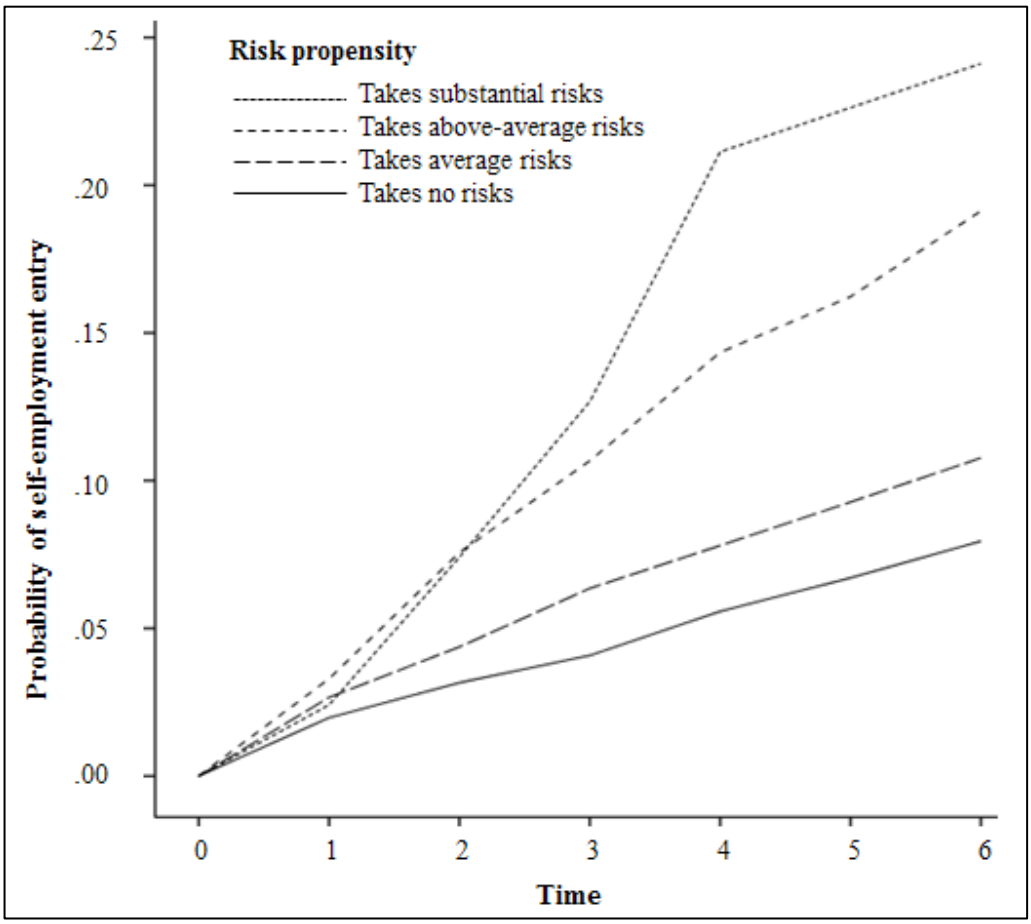

Figure 3.1: Probability of self-employment entry for individuals who take substantial, above-average, average, and no risks over 7 years.

3.4.2 The Impact of Risk Propensity on Self-Employment Survival

Hypothesis 2, which suggests that the relationship between risk propensity and self-employment survival follows an inverted U-shaped curve was also tested using a Cox regression hazard rate model. The control variables were entered into the model in a first step, the linear term of risk propensity was added in a second step, and the squared term of risk propensity was included as a predictor in a third step. Self-employment failure (1 = self-employment failure; 0 = self-employment survival) served as the dependent variable and the time it took for the event of self-employment failure to occur was added as the time variable.

Table 3.3 includes the results of the Cox regression hazard rate model testing Hypothesis 2. It shows that the linear term of risk propensity, which was added to the model in a second step, served as a negative but nonsignificant predictor of self-employment failure. The squared term of risk propensity added in a third step turned out to be positive but also nonsignificant in predicting self-employment failure. The results of the Cox regression hazard rate model thus offer no statistically significant support for Hypothesis 2.

Table 3.3: Cox Regression Hazard Rate Model Predicting Self-Employment Failure

	Step 1 (control variables)			Step 2 (risk propensity)			Step 3 (squared risk propensity)		
	B	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*
Age	-.10	.16	.91	-.10	.16	.90	-.11	.16	.90
Gender	.44**	.13	1.55	.42**	.14	1.51	.42**	.14	1.52
Australian	.15	.15	1.16	.17	.15	1.18	.17	.15	1.18
Married	-.16	.14	.86	-.14	.14	.87	-.13	.14	.88
Educational level	-.01	.06	.99	.00	.06	1.00	.00	.06	1.00
Time employed	-.13	.16	.88	-.13	.16	.88	-.12	.16	.88
Time unemployed	.08	.05	1.08	.08	.06	1.08	.08	.06	1.08
Job satisfaction	-.03	06	.97	-.04	.06	.96	-.04	.06	.96
Income	-.01	.05	.99	.00	.05	1.00	.01	.05	1.01
Household worth	-.04	.05	.96	-.03	.05	.97	-.03	.05	.97
Risk propensity				-.09	.06	.91	-.11	.07	.89
Squared risk propensity							.02	.04	1.02

Note. $N = 904$.

* $p < .05$. ** $p < .01$. *** $p < .001$

Figure 3.2, however, which displays the probability of self-employment survival for all four values of risk propensity over time, offers some support for Hypothesis 2. It suggests that individuals who report that they take no risks tend to have the lowest probability of self-employment survival. Individuals who take average or substantial risks are more likely to remain self-employed than those who are not willing to take risks. Over time, respondents who report having an above-average risk are most likely to survive as entrepreneurs. Again, caution should be taken because individuals' assessment of their own risk propensity is not balanced across the four values of risk propensity. While a majority of respondents indicated that they take no risks (N = 253) or average risks (N = 481), far fewer people reported having an above-average (N = 134) or even substantial risk propensity (N = 36).

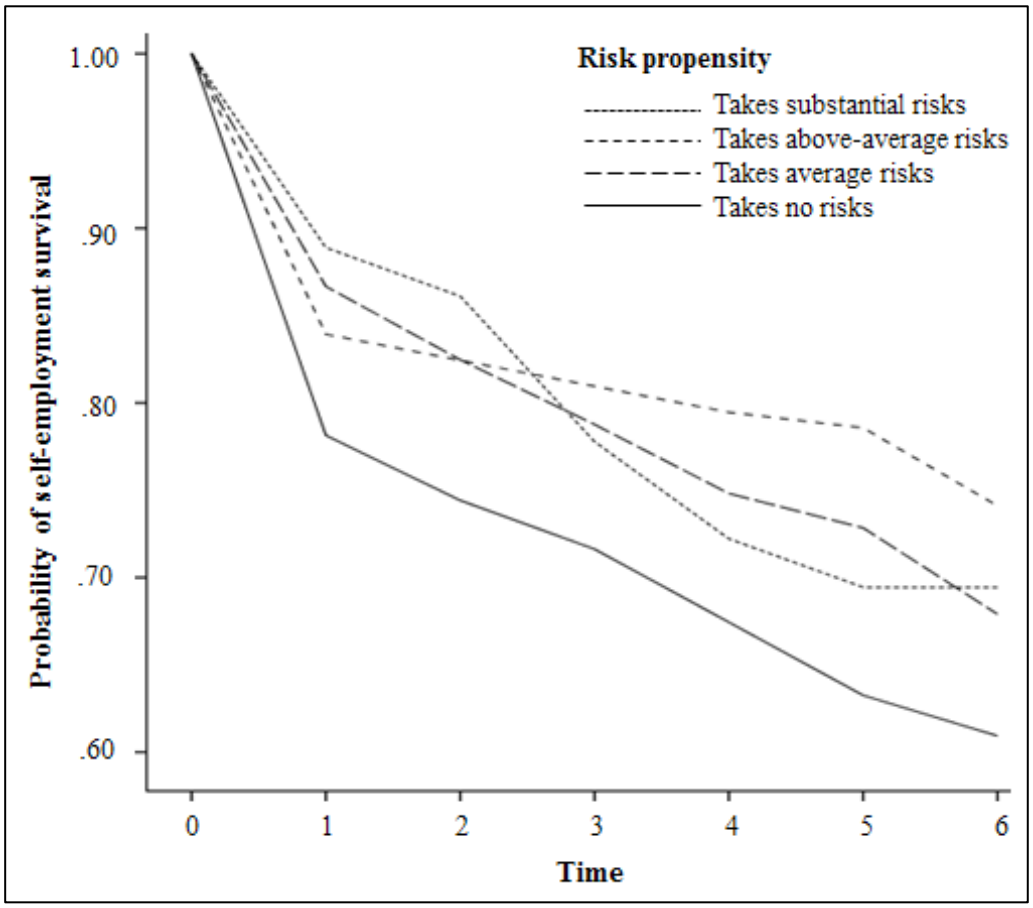

Figure 3.2: Probability of self-employment survival for individuals who take substantial, above-average, average, and no risks over 7 years.

Figure 3.3, which displays the probability of self-employment survival based on risk propensity and its squared term, furthermore shows that the relationship between risk

propensity and self-employment survival seems to follow a concave pattern. More specifically, at low levels of risk propensity, a one-unit increase in risk propensity has a stronger positive effect on self-employment survival than at high levels of risk propensity. In sum, the results thus offer no statistically significant support for Hypothesis 2, but their graphical representations suggest that especially low levels of risk propensity may be detrimental for self-employment survival.

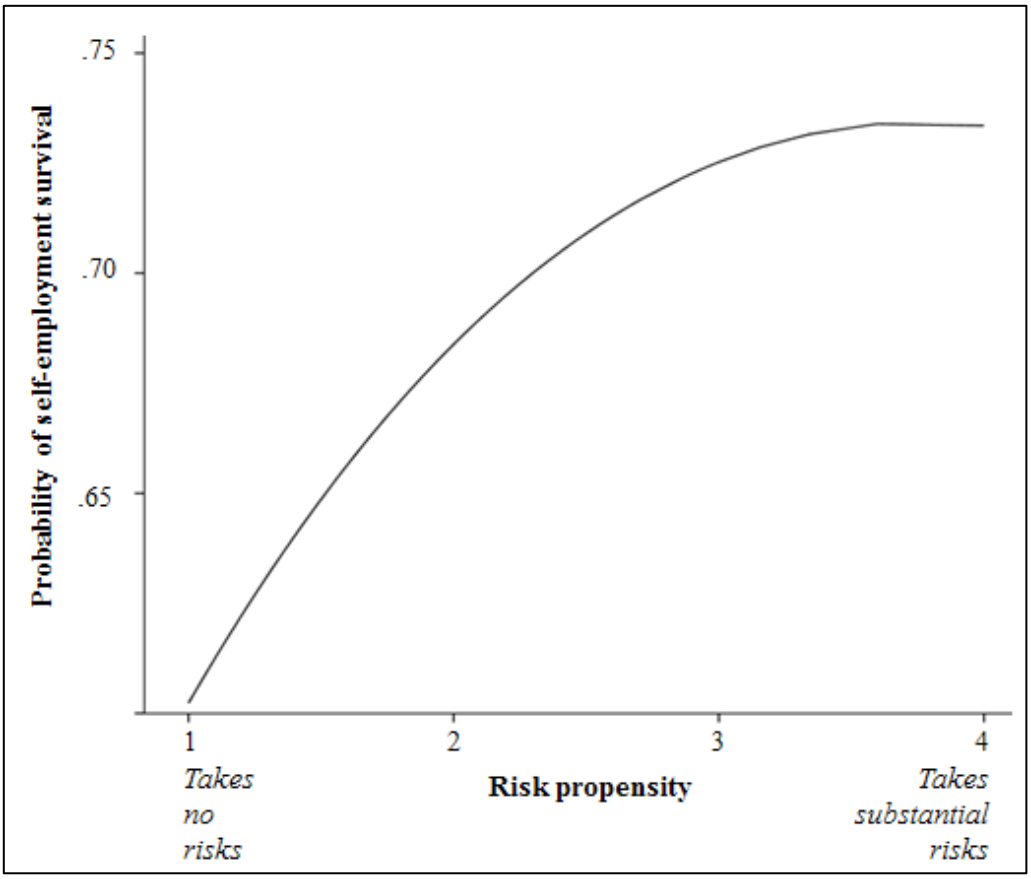

Figure 3.3: Probability of self-employment survival based on risk propensity and its squared term.

3.4.3 The Impact of Self-Employment Entry on Risk Propensity

Hypothesis 3, which states that self-employment entry positively predicts risk propensity, was tested by conducting a linear regression analysis based on the matched sample that had resulted from the propensity score matching procedure described in the Method section of this study. Since initial risk propensity was only controlled for as one of several control variables in the propensity score matching procedure, it was furthermore

included as a predictor in the linear regression analysis. In the linear regression analysis, initial risk propensity was thus included as a predictor in a first step, followed by self-employment entry in a second step. Risk propensity in 2010 served as the dependent variable. Results indicated that self-employment entry served as a significant positive predictor of subsequent risk propensity (B = .15, p = .008), thus offering support for Hypothesis 3.

3.5 Discussion

Scholars have been studying the association between self-employment and risk propensity for a considerable amount of time, and the main finding of those previous studies is that entrepreneurs have a greater willingness to take risks than other groups (Stewart & Roth, 2001). However, only very limited evidence exists that has investigated risk propensity as a causal predictor of self-employment. Especially the distinction between self-employment entry on the one hand and self-employment survival on the other hand has received only little research attention. Therefore, the first aim of the present study was replicate work by Nieß and Biemann (2014) by investigating whether different levels of risk propensity lead to self-employment entry on the one hand and self-employment survival on the other hand.

According to theoretical considerations suggesting that individuals choose work environments that match their personalities (Caplan, 1987; Holland, 1959; Schneider, 1987; Sims, 1983), there is reason to assume that risk propensity serves as a positive predictor of self-employment entry. Nieß and Biemann (2014) found empirical support for this notion in a longitudinal German sample. In the present study, the same analyses were applied to an Australian data set, also making use of the same timeframe. The results strongly resembled those reported by Nieß and Biemann (2014), suggesting that risk propensity serves as a positive and significant predictor of subsequent self-employment entry, even when controlling for a large number of other variables. The effect size that was found in the present study is slightly smaller than the one reported in the original study. More specifically, a value

of risk propensity that was one standard deviation above the mean increased the chances of starting one's own business by 25 % in the Australian sample, while it was 33 % in the German one. Although the association between risk propensity and self-employment entry has already been fairly well established in the literature, the present study offers support for the generalizability of the causal nature underlying this relationship.

Along with its effect of self-employment entry, risk propensity has also been proposed as a potential predictor of self-employment survival. The common intuition pertaining to this relationship is that while extremely low and high levels of risk propensity should be detrimental for venture survival, entrepreneurs with a moderate risk propensity tend to be especially successful. Nieß and Biemann (2014) were amongst the first to investigate this notion empirically in a longitudinal sample and indeed found support for a TMGT effect of risk propensity on subsequent venture survival. In the present study, those analyses were repeated in an Australian sample and no statistically significant effect of risk propensity on self-employment survival was found. The graphical representations of the results, however, provided some support for the notion that especially low levels of risk propensity seem to be detrimental for venture survival. Risk propensity seemed to serve as a positive predictor of self-employment persistence up to an inflection point after which the effect turned asymptotic, but not negative. A potential explanation why this effect may not have been statistically significant could be the operationalization of risk propensity used in the HILDA sample, which made use of a 4-point Likert scale. This scaling resulted in a left-skewed distribution of risk propensity, so that only very few participants with high levels of risk propensity were included in the sample. Therefore, the statistical power for detecting an effect of risk propensity on self-employment survival may have been too low. An unexpected finding that was obtained when assessing the effect of risk propensity on self-employment survival revealed that female participants were more likely to experience self-employment

failure than male participants (see Table 3.3). This is particularly surprising given that women are less likely to become self-employed than men (see Table 3.2). A potential explanation for this finding may be that there is a particular sub-group of women, who give up their self-employment after a short amount of time, for example due to starting a family. This suggestion could be put to an empirical test by future research.

Besides a replication of the work of Nieß and Biemann (2014), the second aim of the present study was to extend the original article by investigating whether self-employment entry also has the potential of evoking changes in entrepreneurs' willingness to take risks. Although personality traits are commonly regarded as stable inter-individual dispositions, recent empirical findings have suggested that certain life events and work experiences can shape personality over time (for an overview, see Woods et al., 2013). Given that risk propensity is commonly associated with entrepreneurship, one could argue that self-employment entry is a life decision that is salient enough to have an effect on entrepreneurs' subsequent willingness to take risks. The results of the present study indicate that self-employment entry indeed positively predicted subsequent risk propensity in an Australian sample. The findings thus offer more support for the notion that personality traits may be subject to change based on salient work-related experiences.

3.5.1 Implications

Since the present study constitutes a replication of the article by Nieß and Biemann (2014), one of its implications revolves around the issue of replicability. Although replicability is one of the main evaluation criteria for sound empirical research, replication studies are rather scarce in both psychological and economic research (Burman, Reed, & Alm, 2010; Smith, 1970). Recent debates about "individual misconduct or even outright frauds" (Asendorpf, et al., 2013, p. 108) have led scholars to introduce a number of recommendations for improving replicability in psychology, one of which is to conduct

generalizability studies making use of alternative data sets. The present study follows this recommendation and finds support for the notion that risk propensity plays a role in predicting self-employment entry and potentially also self-employment survival. In terms of practical implications, one can thus be confident to assume that risk propensity is a personality trait that may be relevant for career counselors and governments in different countries who try to promote and sustain self-employment.

From a theoretical perspective, the results of the present study imply that psychologists' conceptualization of personality may have to be reconsidered. Based on the extension of the study by Nieß and Biemann (2014), results indicate that self-employment entry has the potential of evoking changes in individuals' personality trait of risk propensity. Therefore, the present study's findings add to the current stream of literature investigating work experiences as predictors of personality development, suggesting that self-employment entry may be one of the work-related events that shape personality over time.

3.5.2 Limitations and Avenues for Future Research

Due to the fact that the present study is a replication and extension of work by Nieß and Biemann (2014), its limitations largely correspond with those outlined in the authors' original work. First, the replication inherent in the current study was limited to an Australian sample. Although this allows drawing more confident conclusions regarding the role of risk propensity in explaining the decision to become self-employed in industrial, western countries, the relationship still remains to be explored in developing countries. For example, scholars have studied entrepreneurship in African countries (Frese, 2000) and could benefit from investigating individuals' willingness to take risks as a potential success factor for business start-ups.

Second, the operationalizations of variables, particularly of risk propensity, used in the HILDA sample may have biased the results obtained in the present study. Recall that

respondents were asked to indicate on a 4-point Likert scale the degree to which they are willing to take financial risks. In the subsample of successful and unsuccessful entrepreneurs that was used for testing Hypothesis 2, only 36 respondents (4 %) indicated that they were willing to take substantial financial risks. As outlined above, this distribution of risk propensity may serve as a potential explanation for the nonsignificant curvilinear effect of risk propensity on self-employment survival. More specifically, the analyses may not have reached enough statistical power to estimate whether particularly high levels of risk propensity could indeed be detrimental for venture survival. Therefore, the role of risk propensity in explaining self-employment survival needs further research attention, preferable making use of a validated multi-item risk propensity scale.

Third, as already outlined by Nieß and Biemann (2014), all analyses relied on longitudinal, yet observational data. It is thus neither possible to undoubtedly identify risk propensity as a causal predictor of self-employment entry, nor is it irrevocably the case that self-employment entry causally predicts changes in entrepreneurs' willingness to take risks. The use of advanced statistical analyses such as survival analysis and propensity score matching that were applied to a large, longitudinal data set, unfortunately, cannot replace an experimental research design.

Fourth, what still remains unresolved on the basis of the present study is the question of *how* risk propensity leads to self-employment entry and potentially also to venture survival. Nieß and Biemann (2014) already suggested that the business idea with which individuals enter self-employment may help explain whether risk-taking pays off or leads to business failure. By including the quality of the start-up idea as a possible moderator, future research may help reveal why the relationship between risk propensity and self-employment survival was not statistically significant in the present study. In a similar vein, the mechanisms through which self-employment shapes subsequent willingness to take risks also

continue to be unexplained. Scholars have already suggested that the expectations and norms that are associated with certain work roles may account for personality changes in response to work-related experiences (Roberts et al., 2005). Future research could benefit from investigating such potential explanations for the hypothesized effect of work events on personality.

3.6 Conclusion

The present study replicates and extends work by Nieß and Biemann (2014) on the association between risk propensity and self-employment based on an Australian sample. Its findings offer support for the generalizability of the notion that risk propensity serves as a positive predictor of self-employment entry. The role of entrepreneurs' willingness to take risks in explaining venture survival is, however, less clear: While the analyses yielded no statistically significant results, their graphical representations hint towards a curvilinear relation between risk propensity and self-employment survival. As an extension of the original article, the present study furthermore finds support for the notion that self-employment entry serves as a positive predictor of entrepreneurs' subsequent willingness to take risks.

4 Openness to Experience as a Predictor and Outcome of Upward Job Changes into Managerial and Professional Positions[6]

In industrial and organizational psychology, there is a long tradition of studying personality as an antecedent of work outcomes. Recently, however, scholars have suggested that personality characteristics may not only predict, but also follow from certain work experiences, a notion that is depicted in the *dynamic developmental model (DDM) of personality and work* (Woods et al., 2013). Upward job changes are an important part of employees' careers and career success in particular (Ng et al., 2005), and we argue that these career transitions can shape personality over time. In this study, we investigate the Big Five personality characteristics as both predictors and outcomes of upward job changes into managerial and professional positions. We tested our hypotheses by applying event history analyses and propensity score matching to a longitudinal dataset collected over five years from employees in Australia. Results indicated that participants' openness to experience not only predicted, but that changes in openness to experience also followed from upward job changes into managerial and professional positions. Our findings thus provide support for a dynamic perspective on personality characteristics in the context of work and careers.

4.1 Introduction

Personality characteristics, and the Big Five in particular, have been studied extensively as predictors of work outcomes over the past decades (Ones, Dilchert, Viswesvaran, & Judge, 2007). They predict a broad variety of organizational phenomena, including career mobility (Gattiker & Larwood, 1988), career success (Seibert & Kraimer, 2001), leadership (Judge, Bono, Illies, & Gerhardt, 2002), and job satisfaction (Judge et al., 2002). Given that upward job changes into managerial and professional positions are related to all of these organizational phenomena, surprisingly few studies have investigated whether

[6] This chapter is based on Nieß and Zacher (2014), invited for resubmission to the *Journal of Organizational Behavior*.

such upward job changes may likewise have dispositional causes. The first aim of the present study is therefore to contribute to an emerging area in the career literature (Van Vianen, Feij, Krausz, & Taris, 2003; Vinson, Connelly, & Ones, 2007; Wille et al., 2010; Wille & De Fruyt, 2014; Zacher et al., 2012) by investigating the Big Five as possible antecedents of subsequent upward job changes into managerial and professional positions.

Conceptualizing personality characteristics as potential predictors of organizational phenomena, such as upward job changes into managerial and professional positions, is inherent in most of the literature on the role of personality in the work and career context. It relies on the assumption that personality is temporally stable and must therefore predict work outcomes and not vice versa (Costa & McCrae, 1994). However, already in the 1980s, Kohn and Schooler (1982) suggested that certain aspects of one's job (e.g., work complexity) may influence personality development, and Frese (1982) discussed the importance of occupational socialization for psychological development. This notion has recently been revisited by scholars in the field of personality psychology, who developed the DDM of personality and work. The model states that personality characteristics may not only serve as predictors of work and career experiences, but that work and career experiences may also lead to changes in personality characteristics over time (Wille & De Fruyt, 2014; Woods et al., 2013). Only very few studies so far have explicitly investigated reciprocal influences between personality and work (for an overview of those studies, see Woods et al., 2013). Therefore, little is known about which specific work experiences have the potential of evoking changes in employees' personality characteristics. Based on the DDM of personality and work, the second aim of our study is to investigate whether upward job changes into managerial and professional positions lead to changes in the Big Five over time. Overall, we intend to contribute to the literatures on careers and personality by examining reciprocal effects between personality characteristics and upward job changes into managerial and

professional positions, applying two advanced statistical techniques (event history analyses and propensity score matching) to a large longitudinal dataset.

4.2 Theory

4.2.1 Definitions of the Big Five and Upward Job Changes

The Five-Factor Model is the predominant theoretical framework to investigate associations between personality characteristics and work outcomes (e.g. Ones et al., 2007). The Big Five include (Digman, 1989; Goldberg, 1990): openness to experience (being imaginative, independent-minded, and autonomous), extraversion (being assertive, energetic, and sociable), conscientiousness (being responsible, dependable, and orderly), agreeableness (being cooperative, trusting, and caring), and emotional stability (being calm, secure, and resilient). In industrial and organizational psychology, meta-analyses have shown that some of the Big Five characteristics are related to, for instance, leadership behaviors (Judge et al., 2002), job performance (Barrick & Mount, 1991), and job satisfaction (Judge et al., 2002).

Career researchers defined job changes to entail "substantial changes in work responsibilities, hierarchical levels, or titles" (Feldman & Ng, 2007, p. 352), and we argue that upward job changes into managerial and professional positions include all of these three aspects of job changes. First, employees who enter managerial and professional positions are required to make use of a different skill set, take part in specialized trainings, or take on leadership roles (Dreher & Ash, 1990; McCauley, Ruderman, Ohlott, & Morrow, 1994). They thus experience a substantial shift in work responsibilities. Second, managers and professionals operate on a higher organizational level than technicians, tradesmen, workers, or laborers, so that career transitions into such positions are accompanied by promotions into higher hierarchical levels (Stumpf & London, 1981). Third, job titles in managerial and professional positions, such as managing director, consultant, or judge clearly differ from job titles in non-managerial and non-professional positions, such as electrician, clerk, or

construction worker (Baron & Bielby, 1986; Caldwell, 2002). In sum, moving into managerial and professional positions involves substantial changes in employees' job responsibilities and their work environment.

4.2.2 Effects of the Big Five on Upward Job Changes into Managerial and Professional Positions

According to several prominent theories in the career literature, such as the theory of vocational choice (Holland, 1959), person-environment fit theory (Caplan, 1987; Sims, 1983), and the attraction-selection-attrition model (Schneider, 1987), personality characteristics may serve as predictors of people's career-related decisions. The main conclusion of these theories is that individuals self-select into work environments that provide a good fit with their personality, a notion that has received substantial empirical support (Kristof-Brown et al., 2005). In the present study, we aim to investigate whether individuals' upward job changes into managerial and professional positions can likewise be explained on the basis of their dispositions. This question is particularly important against the backdrop that job changes have become a salient attribute of today's careers (Arthur & Rousseau, 2001) and upward job changes into managerial and professional positions in particular constitute a form of career success (Ng et al., 2005). Upward job changes into these positions may also be important for individuals because through gaining new and diverse work experiences and skills in such positions, employability can be enhanced. Previous research has shown that employees differ in their attitudes toward job mobility and in the way they perceive mobility opportunities (Feldman & Ng, 2007), but only very few empirical studies have so far examined relationships between the Big Five and actual job changes across time (Van Vianen et al., 2003; Vinson et al., 2007; Wille et al., 2010; Wille & De Fruyt, 2014; Zacher et al., 2012). Those studies, however, either relied on cross-sectional data

or did not focus on upward job changes into managerial and professional positions, which are particularly relevant for employees' career success (Arthur, Khapova, & Wilderom, 2005).

The present study aims to extend this stream of research by investigating associations between the Big Five personality characteristics and upward job changes into managerial and professional positions. Based on the conceptualizations of the Big Five characteristics, we are able to establish their effects on such upward job changes. According to a review by Feldman and Ng (2007), openness to experience and extraversion may be the personality characteristics that are especially important in explaining upward career mobility. The authors argue that "individuals with these traits tend to be more active and skillful in seeking out new job opportunities" (Feldman & Ng, 2007, p. 362). Therefore, we develop specific hypotheses for the effects of those two characteristics in explaining upward job changes into managerial and professional positions. For the other three personality characteristics in the Big Five framework, namely conscientiousness, agreeableness, and emotional stability, we do not offer specific hypotheses, but describe why we do not expect them to affect upward job changes into managerial and professional positions. It is important to note, however, that we will include all of the Big Five personality characteristics in the analyses testing whether the Big Five serve as predictors and outcomes of job changes into managerial and professional positions.

Openness to Experience. Individuals with high openness to experience are curious and have a wide array of interests (Costa & McCrae, 1985), which predisposes them to desire new experiences by moving into different jobs and positions. They also have a strong need for change and novelty (Costa & McCrae, 1985), are prone to "job hopping" (Judge, Higgins, Thoresen, & Barrick, 1999, p. 625), and have been found to display a greater job instability than others (Wille et al., 2010). Individuals with high openness to experience can further be characterized by their intellectual abilities and flexibility (Judge et al., 1999), which may lead

them to seek intellectual stimulation in their occupation by taking on more challenging jobs on higher hierarchical levels. Openness to experience is also strongly related to divergent thinking (McCrae, 1987) and creativity (Feist, 1998), and one of its facets is the generation of new ideas (Costa & McCrae, 1985). Those traits are in turn linked to leadership in organizations (Judge et al., 2002; Yukl, 1998), so that employees with high openness to experience may be especially fitting for managerial positions. Additionally, employees with high openness to experience are more likely to seek work in complex, self-directed positions (Kohn & Schooler, 1978) and jobs with higher job status (Judge et al., 1999), such as managerial and professional positions.

Hypothesis 1: Openness to experience positively predicts upward job changes into managerial and professional positions.

Extraversion. Several of the facets of extraversion, such as ambition, assertiveness, activity, and excitement-seeking (Costa & McCrae, 1985), suggest that high scores on this personality characteristic predispose employees to seek out new challenges in their careers. Due to those dispositions, extraverted individuals should be more likely to actively deal with unsatisfactory job experiences by initiating changes (Seibert & Kraimer, 2001). Extraverts indeed switch organizations more frequently than others (Wille et al., 2010) and pursue employment alternatives by initiating job search behaviors (Kanfer, Wanberg, & Kantrowitz, 2001). Extraversion has furthermore emerged as one of the main predictors of job performance, especially in occupations that involve social interaction (Barrick & Mount, 1991). Extraverts tend to be energetic and socially dominant, characteristics that are generally perceived as relevant for leadership positions (Hogan, Curphy, & Hogan, 1994).

Since extraverted employees should have both the ambition and the skills to take on jobs at higher hierarchical levels, they may be especially likely to experience upward job changes into managerial and professional positions. This may be due to the fact that

organizational decision-makers are likely to regard extraverted employees as well-suited for positions that require frequent social interactions and leadership behaviors (e.g. managerial positions; Judge et al., 2002; Ng, Eby, Sorensen, & Feldman, 2005). This notion is supported by empirical findings suggesting that extraversion is the Big Five trait that is the strongest correlate of both leader emergence and leadership effectiveness (Judge et al., 2002). Overall, previous research supports the notion that extraversion predicts job changes up the organizational hierarchy, showing that extraversion has been linked to several indicators of extrinsic career success, including occupational status (Caspi, Elder, & Bem, 1988), job level (Melamed, 1996), managerial advancement (Moutafi, Furnham, & Crump, 2007), and promotions (Seibert & Kraimer, 2001). However, most of this work is cross-section and thus does not allow the investigation of effects of extraversion on subsequent upward job changes over a period of time.

Hypothesis 2: Extraversion positively predicts upward job changes into managerial and professional positions.

Conscientiousness. Conscientiousness is the Big Five characteristic that has been shown to most consistently predict a variety of job performance criteria across a number of occupational groups (Barrick & Mount, 1991). Several facets of conscientiousness, such as competence, achievement-striving, self-discipline, and deliberation suggest that it should be related to career success (Ng et al., 2005). Employees with a strong achievement orientation have indeed been found to experience greater upward career mobility (Crockett, 1962) and managerial advancement (Tharenou, 1997). According to Judge and colleagues (1999), high conscientiousness enables employees to obtain promotions into jobs with a higher complexity and prestige. Therefore, one could argue that conscientious employees may be prone to experience upward job changes into managerial and professional positions. However, since conscientiousness is also associated with high levels of dutifulness and deliberation,

conscientious employees may prefer to stay in the same job and organization due to their high dependability and sense of responsibility (Ng, Sorensen, Eby, & Feldman, 2007). Another facet of conscientiousness, namely risk aversion or cautiousness, further supports the notion that conscientious employees may be less likely to seek out novel job opportunities, especially in managerial and professional positions. Thus, overall, we do not offer a hypothesis on the role of conscientiousness in predicting upward job changes into managerial and professional positions.

Agreeableness. For agreeableness, one can also argue that it may either positively or negatively predict upward job changes into managerial and professional positions. On the one hand, agreeable employees are compliant and altruistic (Costa & McCrae, 1985), and they typically get along well with others. They may therefore be regarded as especially well-suited for leadership positions in which cooperation and teamwork are required (Bass, 1990), and thus experience upward job changes especially into managerial and professional positions. On the other hand, agreeableness is also associated with a need for affiliation (Piedmont, McCrae, & Costa, 1991) and agreeable employees are typically not very competitive or demanding (Costa & McCrae, 1985). They value getting along with others more than pursuing their self-interests (Wille et al., 2010) and may be too soft-hearted and trusting to get ahead in their careers (Seibert & Kraimer, 2001). Therefore, agreeable employees may be prone to remain in the same job or even sacrifice their own career success for the sake of pleasing others (Judge et al., 1999).

Emotional Stability. Emotional stability is associated with good emotional adjustment and high levels of self-esteem, both of which are especially important in higher status occupations (Judge et al., 1999), and are linked to leadership effectiveness (Judge et al., 2002). Due to their high levels of self-confidence, emotionally stable employees may be more likely to apply for new jobs and promotions into managerial and professional positions

in particular. Individuals who score high on emotional stability furthermore typically demonstrate low nervousness and low social anxiety, so that they may be likely to seek out upward job changes. It could thus be argued that emotional stability positively predicts upward job changes into managerial and professional positions. However, emotional stability is also the characteristic that most consistently predicts job satisfaction (Judge et al., 2002), so that employees may be less likely to be willing to leave their current position. This notion is supported by the meta-analytic finding that emotional stability is negatively related to voluntary turnover (Salgado, 2002). In sum, we thus offer no hypothesis on the role of emotional stability in explaining upward job changes into managerial and professional positions.

4.2.3 Effects of Upward Job Changes into Managerial and Professional Positions on Changes in the Big Five

Over the past decade, empirical evidence has emerged in personality and lifespan psychology suggesting that personality changes across the adult lifespan (Roberts, Walton, & Viechtbauer, 2006) and in response to major life events (Specht, Egloff, & Schmukle, 2011). A few studies in organizational psychology have shown that work experiences may likewise shape personality over the working lifespan. First, Kohn and Schooler (1978) found that employees who worked in complex jobs became more intellectually flexible within the timeframe of 10 years. Second, Roberts and colleagues (2003) found that several aspects of employees' work experiences, such as occupational attainment, job satisfaction, and job involvement served as predictors of changes in personality, which were assessed via the Multidimensional Personality Questionnaire (Tellegen, 1982). Third, Jackson and colleagues (2012) showed that lower levels of agreeableness, neuroticism, and openness to experience did not only predict self-selection into the military after high school, but that those participants who had entered military service reported lower levels of agreeableness five

years after their service in comparison to a control group. Fourth, a recent study by Wille and De Fruyt (2014) showed that the Big Five personality traits shape and are shaped by occupational characteristics (Holland, 1959) over a time span of 15 years. Fifth, another recent study came to the conclusion that work characteristics and proactive personality traits influence each other reciprocally (Li et al., 2014).

Research findings suggesting that personality characteristics may not only predict work experiences, but are also subject to change induced by work experiences, have recently been integrated in the DDM of personality and work (Woods et al., 2013). The model suggests that personality should not only be regarded as an independent variable fostering certain work experiences, but that personality characteristics may also serve as dependent variables of career-related events. The latter changes in personality can be explained in more detail by at least two theoretical frameworks, namely *trait activation theory* (Tett & Guterman, 2000) and social investment theory (Roberts et al., 2005).

Trait activation theory suggests that personality characteristics require relevant situations to be expressed (Tett & Guterman, 2000), which is referred to as the trait-activation potential of the situation. Applied to the context of the present study, upward job changes into managerial and professional positions may provide employees with new situations that have a different trait-activation potential than previous situations. Employees are then required to make use of the appropriate traits when they are confronted with those novel situations. By consistently behaving according to the requirements of the situation, those traits may then be enhanced. For example, employees may change into positions that involve showing leadership behaviors. In those new positions, they are likely to be confronted with situations that have a stronger trait-activation potential for openness to experience and extraversion than their previous positions did. They are therefore required to behave in a more open and extraverted way and subsequently perceive themselves as more open and extraverted than

prior to the job change. In sum, employees who experience job changes thus encounter situations with a new trait-activation potential and by behaving according to the requirements of those situations, certain traits may be enhanced. Support for the relevance of situations' trait-activation potential in the work context stems from a recent study by Judge and Zapata (2014). The authors found that the Big Five predicted job performance particularly well when the job context was relevant for respective personality characteristics. For example, openness to experience was a particularly strong predictor of job performance in situations requiring creativity, while extraversion played a key role in contexts involving social interactions.

Another theoretical underpinning for effects of job changes on changes in personality characteristics stems from social investment theory. It argues that "investing in social institutions, such as age-graded social roles, is one of the driving mechanisms of personality development" (Roberts et al., 2005, p. 8). The theory purports that as individuals enter certain life roles, such as marriage or the workforce, they make a psychological commitment to those roles. In order to fulfill the social expectations associated with certain life roles, individuals' personalities may shift accordingly. Applied to the context of this study, employees psychologically commit to and invest in their new roles as they enter managerial and professional positions. Since those positions are associated with certain behavioral expectations, such as being open to new experiences or extraverted, employees may behave accordingly. Their personalities subsequently shift according to those expectations. Supporting the theoretical propositions of social investment theory, Hudson, Roberts, and Lodi-Smith (2012) found that social investment at the workplace indeed affected personality development. More particularly, results suggested that employees who cognitively and emotionally invested in their jobs showed both cross-sectional and longitudinal changes in their Big Five personality characteristics. Social investment theory further suggests that the reciprocal influences between personality characteristics and work experiences are likely to

be corresponsive, as posited in the corresponsive principle (Roberts et al., 2003): the same characteristics that predict specific work experiences are the ones that are more likely to change due to those experiences (Roberts et al., 2003). Based on trait activation theory, social investment theory, and the corresponsive principle, we thus propose that openness to experience and extraversion not only influence upward job changes into managerial and professional positions, but that such job changes also influence openness to experience and extraversion over time. For the other three traits of the Big Five framework, we again offer no directional hypotheses, but argue why we expect no reciprocal influences between them and upward job changes into managerial and professional positions.

Openness to Experience. According to trait-activation theory (Tett & Guterman, 2000) and social investment theory (Roberts et al., 2005), managerial and professional positions would have to confront employees with situations in which they are expected to behave openly in order to evoke changes in their openness to experience. Upward job changes into these positions indeed entail new situations that require employees to adapt to new people with ideas and opinions different from their own, new job requirements, and new environments (Feldman & Ng, 2007). The new work requirements of employees in managerial and professional positions furthermore call for creative solutions and divergent thinking (Mumford, Marks, Connelly, Zaccaro, & Johnson, 1998), which are key aspects of openness to experience (McCrae, 1987). When taking on leadership roles, there may be especially many novel situations and unforeseen changes (LePine, Colquitt, & Erez, 2000) with a high trait-activation potential for openness to experience, so that this personality characteristic may be enhanced due to upward job changes into managerial and professional positions. Research has shown that individuals with high openness to experience "are better able to understand and adapt to others' perspectives" (Judge & Bono, 2000, p. 754). When faced with the challenges of new jobs on higher hierarchical levels, these employees should

be able to master them particularly well, which in turn is likely to positively impact on their openness to experience. Since we argue that openness to experience serves as a predictor of upward job changes into managerial and professional positions, the corresponsive principle (Roberts et al., 2003) would suggest that employees also become more open in response to those job changes.

Hypothesis 3: Upward job changes into managerial and professional positions predict increases in openness to experience over time.

Extraversion. Extraversion is particularly relevant in social interactions and in leadership roles (Judge et al., 2002). In response to upward job changes into managerial and professional positions, employees have to adapt to new social environments and interact with relevant others in order to build a professional network (Ibarra & Hunter, 2007). In addition, they may be required to take on a leadership role and exert social dominance in their new position (Gough, 1990). According to trait-activation theory (Tett & Guterman, 2000), the situations in managerial and professional positions should thus have a high trait-activation potential for extraversion, such that employees may become more extraverted in response to upward job changes into such positions. Social investment theory (Roberts et al., 2005) would furthermore suggest that managerial and professional positions, which require networking and potentially leadership behaviors, are tied to expectations of being extraverted. Therefore, upward job changes into managerial and professional positions should have the potential of increasing employees' extraversion. Since we argue that extraversion serves as a predictor of upward job changes into such positions, the corresponsive principle (Roberts et al., 2003) would suggest that extraversion should also be enhanced in response to those job changes. Overall, we assume that extraversion increases in response to the exposure to and increased practice of dealing with social and leadership requirements that accompany upward job changes into managerial and professional positions.

Hypothesis 4: Upward job changes into managerial and professional positions predict increases in extraversion over time.

Conscientiousness. Employees who experience upward job changes into managerial and professional positions may increase in conscientiousness because they need to prove themselves in their new work environments. They may become especially dutiful and self-disciplined and try to avoid mistakes in order to make a good impression on their new superiors and colleagues. Also, conscientious employees may try to do their new managerial or professional position justice by working in an especially conscientious way. On the other hand, one may argue that when employees enter a new job, especially one in a higher hierarchical position, they may already have achieved their goal of being promoted. They may then have a lesser need for being conscientious and achievement-striving at work. Since there is reason to assume that upward job changes into managerial and professional positions may either enhance or limit employees' conscientiousness, no directional hypothesis is offered here.

Agreeableness. Employees who experience upward job changes into managerial and professional positions need to adapt to new social structures in different work environments with new colleagues and superiors. Therefore, one could argue that their agreeableness may increase in response to those novel and diverse social interactions, particularly if those social interactions occur with decision-makers in the organization. On the other hand, employees who experience upward job changes, especially into leadership positions, may be required to behave in a less agreeable way in order to successfully fulfill their leadership tasks, for example when tasks have to be delegated to subordinates or in situations requiring negotiation skills. Thus, agreeableness could increase or decrease in response to upward job changes into managerial and professional positions.

Emotional Stability. Job changes, especially into higher hierarchical positions, typically involve tasks with more social responsibilities. Employees experiencing those upward changes may be insecure about their new duties and responsibilities, which may become evident in higher levels of neuroticism and thus lower levels of emotional stability. On the other hand, changing jobs may also increase individuals' emotional stability, for example when they escape the undesirable circumstances of their previous job on lower hierarchical levels or when they regard becoming promoted into leadership positions as a consequence of their success at work. One could thus argue that emotional stability may either decrease or increase in response to upward job changes into managerial and professional positions.

4.3 Method

4.3.1 Participants

To test our hypotheses, we used data from the HILDA survey, a national representative panel study that has been conducted annually since 2001 and surveys approximately 20,000 individuals each year (Wooden & Watson, 2007). All publications that have ever used the HILDA dataset can be obtained from the University of Melbourne Institute of Applied Economic and Social Research website (Melbourne Institute of Applied Economic and Social Research, 2014). To the best of our knowledge, no study has previously used the HILDA dataset to investigate relationships between personality characteristics and upward job changes into managerial and professional positions. Studies have, however, investigated the predictive role of personality characteristics in explaining occupational choice (Ham, Junankar, & Wells, 2009) and occupational change which according to the authors "is *not* a promotion or job change" (Carless & Arnup, 2011, p. 85).

The longitudinal design of the HILDA survey enabled us to investigate the effects of the Big Five on *subsequent* job changes and the effects of job changes on *changes* in

personality characteristics over time. It also allowed us to control for a number of potentially important confounding variables (i.e., age, gender, educational background, and tenure in the occupation) that may influence the relationships between the variables of interest. We only included participants for whom information on personality characteristics in the years 2005 and 2009 as well as job status for all of the measurement waves 2005 through 2009 was available, resulting in a sample of N =3,489 participants.

4.3.2 Measures

We extracted variables measured between 2005 and 2009 from HILDA. We chose the year 2005 as starting point because the Big Five were measured for the first time in that wave. The Big Five were assessed for a second time in 2009. Data from the measurement waves 2005 through 2009 were used to operationalize job changes between the waves. The resulting data were therefore longitudinal and allowed investigating the effects of the Big Five assessed in 2005 on subsequent job changes between 2005 and 2009 as well as the effects of job changes on the Big Five assessed in 2009 (taking into account the Big Five measured in 2005).

Big Five Characteristics. Openness to experience, extraversion, conscientiousness, agreeableness, and emotional stability were assessed in 2005 and 2009 with 28 items based on the well-validated Big Five scales developed by Saucier (1994). Respondents were asked how well 28 adjectives describe them on a 7-point scale ranging from 1 (*does not describe me at all*) to 7 (*describes me very well*). We reversed items that were phrased negatively and calculated the scale means by dividing the sum of all item scores by the number of items for each of the Big Five personality characteristics. Internal consistency reliability estimates of all scales were satisfactory with all Cronbach's αs $\geq .74$ (also see Table 4.1).

Upward Job Changes into Managerial and Professional Positions. Upward job changes into managerial and professional positions were operationalized on the basis of the

coding scheme provided by the *Australian and New Zealand Standard Classification of Occupations (ANZSCO)*. The ANZSCO is a skill-based classification system that aims to catalogue all occupations in the Australian labor market (Australian Bureau of Statistics, 2013). It makes use of eight major groups (managers, professionals, technicians and trade workers, community and personal service workers, clerical and administrative workers, sales workers, machinery operators and drivers, and laborers), all of which are again divided into several sub-major groups (such as education professionals, health professionals, etc.).

In the ANZSCO, each of the sub-major groups is assigned a particular skill level that is required for working in that occupation. Skill levels range from 1 to 5 and are defined by the range and complexity of the tasks that are performed in an occupation and are operationalized as the level and amount of formal education and training, previous experience, and on-the-job training required for working in the occupation. Thus, the coding of skill levels in ANZSCO is very similar to the 'job zones' used in the O*NET in the United States (Peterson, et al., 2001; see also http://www.onetonline.org/find/zone). In the major groups of managers and professionals, almost all of the occupations (except hospitality, service, and retail managers and farmers, all of which were therefore not included in the sample) are assigned the highest possible skill level (i.e., 1), while none of the other major groups are assigned the highest skill level. Therefore, working in managerial and professional positions requires a higher set of skills than any other position in ANZSCO and takes place in hierarchically higher positions.

Participants were coded as having made an upward job change into managerial and professional positions (i.e., a score of 1) if they had changed their occupation from non-managerial and non-professional positions to managerial and professional positions and remained in such positions in the timeframe of 2005 through 2009. If they remained in non-managerial and non-professional positions associated with a lower skill-level within the same

timeframe, this was coded as no upward job change into managerial and professional positions (i.e., a score of 0). This procedure resulted in N = 247 participants who experienced an upward job change into managerial and professional positions and N = 1,710 participants who remained in non-managerial and non-professional positions.

Control Variables. In all analyses, we controlled for age, gender, educational level, and tenure in the occupation. Age was included as a control variable because personality changes across the lifespan (Roberts et al., 2006). Gender was controlled in the analyses because careers of men and women develop differently (Biemann, Zacher, & Feldman, 2012). Finally, educational level and tenure are two main predictors of job attainment (Judge, Cable, Boudreau, & Bretz, 1995). Educational level was measured on a 9-point scale ranging from 1 (*year 11 in high-school or below*) to 9 (*master or doctoral degree*). Tenure in the occupation was operationalized as the number of years the participant has worked in the same occupation prior to the change reported in the timeframe of the study.

4.3.3 Statistical Analyses

We used maximum likelihood estimation to impute missing data in the control variables (Schafer & Graham, 2002), which was present for less than 1% of cases. Subsequently, we used two different methodological approaches to test our hypotheses.

First, we employed event history analyses, also known as survival analyses (Allison, 1984; Miller, 2011), to estimate the effects of the Big Five on upward job changes into professional and managerial positions. Event history analysis not only estimates whether an event occurred or not, but also takes into consideration the time it took for the event to occur. This analytical approach thus treats job change as a time-dependent variable rather than a binary variable. Furthermore, event history analysis accounts for censored data. The observation period of the present study ended after 2009, but it is possible that individuals experienced upward job changes into managerial and professional positions after that. Our

data were therefore right-censored, and event history models accounted for this. In the event history analyses, we entered all control variables in a first step of a Cox regression hazard rate model (Cox & Oakes, 1984), the personality characteristics measured in 2005 in a second step, and the time until the upward job changes occurred as the time variable.

Second, we employed propensity score matching (for a recent overview, see Connelly, Sackett, & Waters, 2013; Rosenbaum & Rubin, 1983) for testing the hypotheses concerned with the effects of upward job changes into managerial and professional positions on changes in personality. Researchers have suggested that propensity score matching is the method of choice when estimating causal effects of group membership on the basis of observational data (Harder et al., 2010). When participants cannot be randomly assigned to experimental conditions, such as in our study to upward job change into managerial and professional positions versus no change into such positions, a comparison between those experimental conditions may be distorted (Dehejia & Wahba, 2002). Propensity score matching aims at reducing this bias by pairing participants from the different experimental conditions who are similar in terms of certain pre-defined covariates. We included the control variables (age, gender, education, tenure in the occupation) as well as the Big Five measured in 2005 into the model as covariates, since pretest scores are especially important covariates (Steiner, Cook, Shadish, & Clark, 2010).

Using the MatchIt software package for SPSS (Ho et al., 2011), we estimated a propensity score for each participant, which is a measure of the likelihood of a person's group membership given the observed covariates. Participants from both groups were then matched using a 1:2 nearest neighbor matching. Consistent with previous research, we imposed a caliper of .20 of the standard deviation of the propensity score's logit to avoid matches of very diverging propensity scores (Jackson et al., 2012). After the matching, none of the standardized mean differences between the covariates were above $d = .20$, so that we could

conclude that the matching improved the overall balance between the groups. The matching procedure resulted in a sample of N = 687 participants for these analyses. Based on this matched sample, we then conducted group comparisons (independent sample *t*-tests) for estimating whether individuals who experienced an upward job change into managerial and professional positions differed from participants who did not experience such a change in terms of their subsequent scores on the Big Five assessed in 2009.

4.4 Results

Table 4.1 presents the means, standard deviations, and correlations of variables.

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Table 4.1: Means, Standard Deviations, and Correlations among the Studied Variables

Variable		MD	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Age	42.60	11.27															
2	Gender	.47	.50	.07***														
3	Education	4.65	2.63	-.08***	-.02													
4	Tenure in Occupation	9.59	9.74	.33***	-.07***	.10***												
5	Openness 2005	4.28	1.02	-.03	-.02	.22***	-.02	.74										
6	Extraversion 2005	4.44	1.08	-.04**	.14***	-.01	-.06***	.05**	.78									
7	Conscientiousness 2005	5.13	1.00	.06**	.12***	.09***	.08***	.04*	.12***	.79								
8	Agreeableness 2005	5.36	.88	.04*	.29***	.03	.01	.25***	.15***	.26***	.81							
9	Emotional Stability 2005	5.15	1.04	.10***	.03	.05**	.07***	-.17***	.19***	.27***	.16***	.75						
10	Upward Job Change	.13	.33	-.07**	.02	.23***	-.06**	.14***	.03	-.01	.05*	.02						
11	Openness 2009	4.22	1.02	-.02	-.04*	.22***	-.01	.74***	.05**	.03	.16***	-.08***	.15***	.75				
12	Extraversion 2009	4.42	1.08	-.03	.13***	-.02	-.05**	.04*	.78***	.09***	.13***	.14***	.02	.06**	.79			
13	Conscientiousness 2009	5.18	.97	.05**	.14***	.05**	.06***	.02	.11***	.72***	.19***	.21***	.00	.06**	.11***	.80		
14	Agreeableness 2009	5.36	.87	.06**	.29***	.03	.03	.17***	.16***	.19***	.66***	.17***	.03	.26***	.17***	.26***	.80	
15	Emotional Stability 2009	5.25	1.01	.10***	.05**	.05**	.07***	-.08***	.15***	.23***	.19***	.66***	.02	-.15***	.18***	.28***	.19***	.81

Note. N = 3,489. Cronbach's alphas are in diagonal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

4.4.1 Effects of the Big Five on Upward Job Changes into Managerial and Professional Positions

As outlined in the Method section, we used Cox regression hazard rate models to assess the effects of the Big Five on upward job changes into managerial and professional positions. Results can be found in Table 4.2 and indicate that openness to experience significantly and positively predicted upward job changes into managerial and professional positions (B = .33, p < .001). The odds ratios suggest that a one-unit increase in openness to experience is associated with a 39 % higher likelihood of experiencing upward job changes into managerial and professional positions. None of the other Big Five characteristics had a statistically significant effect on upward job changes into managerial and professional positions (see Table 4.2). Results thus offered support for Hypothesis 1, but not for Hypothesis 2, suggesting that openness to experience – but not extraversion and the other Big Five characteristics – had an effect on upward job changes into managerial and professional positions.

Table 4.2: Results of the Cox Regression Hazard Rate Model Predicting Upward Job Changes into Managerial and Professional Positions

	Step 1 (control variables)			Step 2 (personality characteristics)		
	B	*SE B*	*Odds ratio*	*B*	*SE B*	*Odds ratio*
Age	-.01	.01	.99	-.01	.01	.99
Gender	.15	.13	1.17	.17	.14	1.18
Education	.29***	.03	1.34	.27***	.03	1.31
Tenure in Occupation	-.02*	.01	.98	-.02*	.01	.98
Openness 2005				.33***	.07	1.39
Extraversion 2005				.05	.06	1.05
Conscientiousness 2005				-.12	.07	.88
Agreeableness 2005				.01	.09	1.01
Emotional Stability 2005				.11	.07	1.12

Note. N =1,957.
* p < .05. *** p < .001.

4.4.2 Effects of Upward Job Changes into Managerial and Professional Positions on Changes in the Big Five

For estimating the effects of upward job changes into managerial and professional positions on changes in the Big Five, we made use of group comparisons on the basis of the matched sample that had resulted from the propensity score matching procedure outlined in the Method section. This procedure ensured that control variables and initial levels of personality characteristics were accounted for. Results (see Figure 4.1) indicated that participants who experienced upward job changes into managerial and professional positions were significantly higher in subsequent openness to experience (M = 4.40, SD = .06) than participants who did not experienced such changes (M = 4.18, SD = .05; $t(685) = 2.81$, p = .005). This difference in means corresponds to an effect size of Cohen's d = .21, which would be considered a small effect (Cohen, 1977). Figure 4.1 further shows that individuals who experienced upward job changes into managerial and professional positions did not differ significantly from individuals who did not experience such job changes in terms of extraversion and any of the other Big Five characteristics. Results therefore offered support for Hypothesis 3, but not for Hypothesis 4.

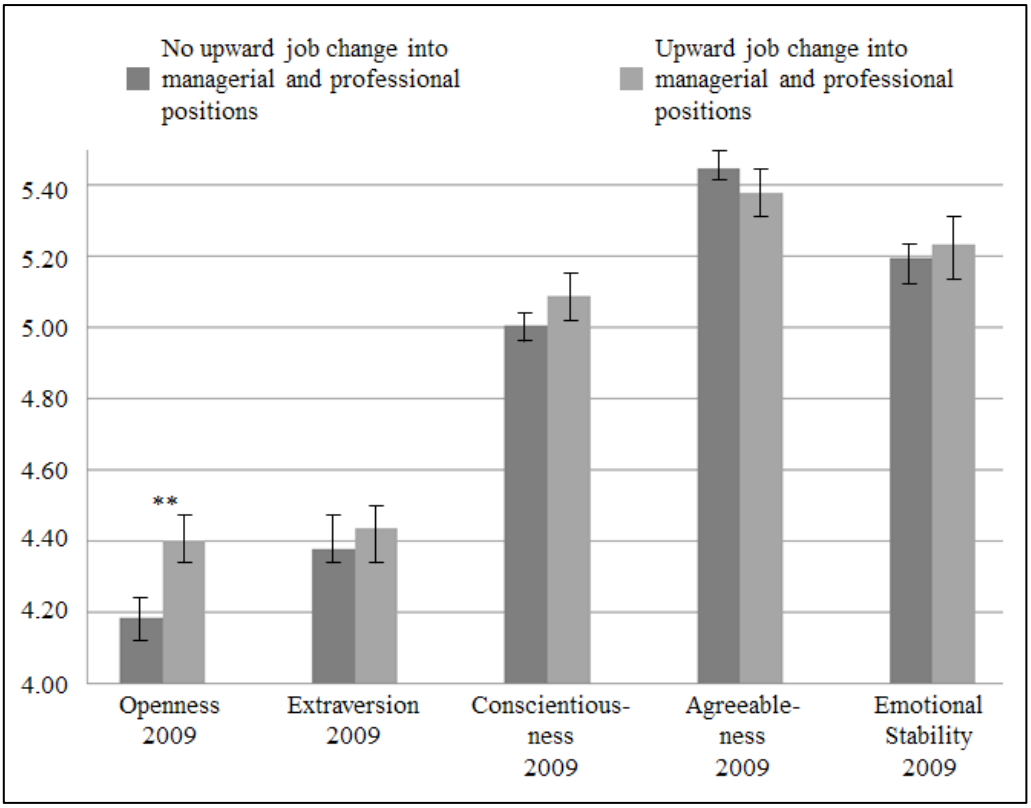

Figure 4.1. Means of personality characteristics in 2009 for participants who experienced no upward job change into managerial and professional positions and participants who experienced an upward job change into managerial and professional positions. Error bars represent standard errors.
*** Independent sample t-test significant at p < .01.*

4.4.3 Additional Analyses

We conducted a number of additional analyses to shed further light on reciprocal influences between personality characteristics and job changes. First, we repeated the analyses reported in the previous sections separately for participants who had experienced an upward job change into a managerial position and those who entered into a professional position. These subsamples were considerably smaller with N = 56 participants who experienced an upward job change into a managerial position and N = 164 participants who experienced an upward job change into a professional position. For participants who entered into managerial positions, we found a positive effect of openness to experience in a Cox hazard rate model (B = .16, p = .291) which, however, did not reach statistical significance. Interestingly, analyses further revealed that gender had a significantly negative effect on

upward job change into managerial positions (B = -.88, p = .007). Similar to the results obtained in the initial analyses, we again found education to positively predict upward job changes into managerial positions as well (B = .30, p < .001). For professional positions, a Cox hazard rate model indicated that openness to experience had a significantly positive effect on upward job changes (B = .39, p < .001), thus resembling the results of the initial analyses. Out of the control variables, gender (B = .53, p = .002), education (B = .24, p < .001), and tenure in the occupation (B = -.03, p = .005) also predicted upward job changes into professional positions, thus resembling the results obtained in the initial analyses.

We next conducted propensity score matching and subsequent independent sample *t*-tests separately for changes into managerial and changes into professional positions to investigate whether participants who experienced upward job changes differed from participants who did not experience such changes in terms of their personality characteristics assessed in 2009. Results showed that the difference in openness to experience between participants who experienced a job change into managerial positions (M = 4.29, SD = .13) and those who did not experience such a change (M = 4.20, SD = .10) was of a similar size as the effect found in the initial analyses, but the difference did not reach statistical significance (t(159) = 1.18, p = .242). For professional positions, participants who entered into such positions had higher levels of openness to experience (M = 4.45, SD = .08) than those who did not enter these positions (M = 4.27, SD = .06), and the difference was marginally significant (t(465) = 174, p = .083). In sum, the results of this first set of additional analyses pointed in the same direction as those obtained in the initial analyses, but did not always reach statistical significance due to the considerably smaller sample sizes.

As a second set of additional analyses, we made use of a more diverse sample of participants who experienced an upward job change into managerial and professional positions. More specifically, the initial analyses had been conducted with data from

participants who experienced an upward job change into managerial and professional positions and then remained in that position during the study period. In additional analyses, we also included participants who experienced an upward change, a downward change, and another upward change into managerial and professional positions in the timeframe of the study. Based on a sample of N = 1,999 participants, results of a Cox regression hazard rate model revealed that openness to experience significantly predicted upward job changes into managerial and professional positions (B = .36, p < .001). Out of the control variables, we again found education (B = .26, p < .001) and tenure in the occupation (B = -.02, p = .043) to serve as predictors of such upward job changes. Additionally, participants' conscientiousness significantly and negatively predicted upward job changes into managerial and professional positions (B = -.13, p = .039). *T*-tests that we conducted on the sample that had resulted from the propensity score matching procedure further showed that participants who entered managerial and professional positions had a higher openness to experience (M = 4.41, SD = .06) than participants who did not enter such positions (M = 4.26, SD = .05; t(794) = 1.96, p = .051). Results thus strongly resembled those obtained in the additional analyses.

Third, we investigated whether personality characteristics and *downward* job changes from managerial and professional positions into other positions also influence each other over time. Results of a Cox regression hazard rate model showed that none of the personality characteristics predicted downward job changes from managerial and professional positions. Both education (B = -.31, p < .001) and tenure in the occupation (B = -.05, p < .001) served as negative predictors of such downward changes. The *t*-tests that we conducted on the matched sample revealed that individuals who experienced a downward job change from managerial and professional positions scored significantly higher in agreeableness (M = 5.58, SD = .07) than individuals who remained in managerial and professional positions (M = 5.35, SD = .06; t(388) = 2.47, p = .014).

Fourth, we examined the possibility that the Big Five personality characteristics may have curvilinear effect on upward job changes into managerial and professional positions. This notion is based on the finding by Grant (2013), who found that the relationship between extraversion and sales performance followed an inverted U-shaped function, as also proposed by the meta-theoretical principle of the TMGT effect (Pierce & Aguinis, 2013). In a Cox regression hazard rate model, we entered the control variables in a first step, the linear terms of the Big Five in a second step, and the squared terms of the Big Five in a third step to estimate their effect of such upward job changes. Analyses revealed that none of the squared personality characteristics served as predictors of upward job changes into managerial and professional positions.

4.5 Discussion

Over the past decade, theory and empirical research have accumulated suggesting that personality characteristics do not only predict work experiences, but that work experiences also may lead to changes in personality characteristics over time (Jackson et al., 2012; Li et al., 2014; Roberts et al., 2003; Woods et al., 2013; Wille & De Fruyt, 2014). The overarching goal of this study was to test this notion of reciprocal effects between personality and work with regard to upward job changes into managerial and professional positions, which represent important career transitions (Feldman & Ng, 2007) and are relevant indicators of employees' career success (Ng et al., 2005).

We first examined effects of the Big Five on upward job changes into managerial and professional positions. We therewith extended existing empirical findings supporting the theory of vocational choice (Holland, 1959), person-environment fit theory (Caplan, 1987; Sims, 1983), and the attraction-selection-attrition model (Schneider, 1987) by investigating whether personality characteristics not only predict initial job choices, but also *changes* in individuals' careers. Our results indicated that openness to experience played a key role in

explaining upward job changes into managerial and professional positions, while the remaining four personality traits in the Big Five framework had no statistically significant effects. Employees who are particularly open to experience seem to either self-select or be promoted into managerial and professional positions. This may be due to the fact that openness to experience is associated with intellectual ability and flexibility, divergent thinking, and the generation of new ideas, all of which seem to be especially important in managerial and professional positions.

Extraversion, which we also expected to predict such upward job changes, did not emerge as a statistically significant predictor of upward job changes into managerial and professional positions. Based on several of the facets of extraversion, such as ambition, assertiveness, and social dominance, one would have expected this personality characteristic to play a role in predicting job changes into hierarchically higher positions. However, extraversion is also associated with high levels of career and job satisfaction, which may lead extraverted employees to not actively initiate upward job changes. Our finding from an Australian sample complements previous research, which has shown that extraversion serves as a predictor of objective career success in Europe, but not in the United States (Boudreau, Boswell, & Judge, 2001). While the importance of openness to experience for upward job changes is thus consistent with theoretical accounts on the role of personality characteristics for job changes (Feldman & Ng, 2007; Ng et al., 2007), the same does not hold for extraversion. Future research should aim at examining potential explanations for this unexpected finding.

Another unexpected finding that was obtained in the additional analyses revealed that participants' conscientiousness negatively predicted upward job changes into managerial and professional positions when they were operationalized to also include employees who experienced several upward and downward job changes within the timeframe of the study.

This finding mirrors the results obtained in Seibert and Kraimer's (2001) meta-analyses, where conscientiousness also had a negative, but non-significant effect on the salary and, more importantly, the number of promotions that employees obtained. The high levels of job satisfaction and risk-aversion that characterize conscientious employees may thus hinder them in obtaining managerial and professional positions.

Second, we investigated whether upward job changes into managerial and professional positions also lead to changes in personality characteristics over time based on the guiding framework of the DDM of personality and work (Woods et al., 2013). Our results suggested that upward job changes into professional and managerial positions predicted only increased levels of openness to experience, but not the other Big Five characteristics. When employees are confronted with novel situations and role expectations in managerial and professional positions, their level of openness to experience seems to shift accordingly. This finding may be explained by the notion that employees in managerial and professional positions frequently encounter challenging situations that require them to make use of their divergent thinking skills, their potential of generating new ideas, or their creativity, all of which are facets of openness to experience.

Unexpectedly, we did not find an effect of upward job changes into managerial and professional positions on extraversion. This finding may suggest that the situations that employees encounter in such positions do not have a high trait-activation potential for extraversion. Alternatively, the social expectations associated with managerial and professional positions may not be relevant for extraversion. For example, employees in managerial and professional positions may actually not be expected to exert social dominance (Hogan et al., 1994), particularly shortly after entering such positions, so that behaving socially dominant would not be in line with expectations associated with the new role. Again,

future research is needed to investigate why upward job changes into managerial and professional positions do not seem to play a role in shaping employees' extraversion.

4.5.1 Theoretical Implications

Overall, our findings offer support for the core proposition of the DDM, which suggests that personality characteristics may not only predict relevant work experiences, but that work experiences can also lead to changes in personality characteristics over time. Trait-activation theory (Tett & Guterman, 2000) and social investment theory (Roberts et al., 2005) provide a theoretical basis to explain those results. When individuals change into higher hierarchical positions, they are confronted with situations that have a novel trait-activation potential compared to previous work-related situations. Through upward job changes into managerial and professional positions, employees furthermore enter and commit to new social roles that are associated with specific social expectations. Due to the opportunity to behave according to the trait-activation potential of the newly encountered situations and in order to fulfill the associated social expectations, personality characteristics relevant to the new job can become more pronounced. In the context of the present study, this means that employees become more open to experience in response to upward job changes into managerial and professional positions.

Moreover, the results of our study support the corresponsive principle in the personality literature (Roberts et al., 2003), indicating that the personality traits that predict specific work experiences are the same ones that are enhanced by those experiences. The corresponsive principle may be particularly relevant for cross-sectional research findings that have established a relation between personality characteristics and work outcomes. These findings may well have supported the predictive validity of personality in industrial and organizational psychology, but may have missed that work experience can also shape the same personality characteristics that have led to the work experience in the first place. Future

research could thus greatly benefit from reexamining well-established relationships between personality and work outcomes by also investigating whether reciprocal influences exist. Such research would furthermore be able to detect potential ceiling effects that could occur if already distinct personality traits keep being enhanced by work experiences over time.

The findings of the present study also suggest that upward job changes into managerial and professional positions only shape a single personality trait, namely openness to experience, and that the effect of job changes on openness is rather small. Picking up on the long-running person-situation debate in psychology, Judge and Zapata (2014) have recently shown that employees are particularly likely to express certain traits when the situations they find themselves in activate those traits. Applied to the context of the present study, this finding could have two implications. First, work experiences may have to be relevant for certain personality characteristics in order for those characteristics to be enhanced over time. This could be an explanation for the finding that upward job changes into managerial and professional positions only had an effect on employees' openness to experience, but not on any other Big Five characteristic. Second, situational cues may have to be even stronger in order to produce more pronounced changes in personality characteristics than the ones that were found in response to job changes into managerial and professional positions.

4.5.2 Limitations and Avenues for Future Research

The present study has some limitations, which reveal promising avenues for future research. First, we cannot draw definite causal inferences based on our data, which was collected longitudinally, but was not based on an experimental research design with random assignment of participants to an experimental condition (upward job changes into managerial and professional positions) and a control condition (no upward job changes into managerial and professional positions). Such an ideal experimental design would be very difficult and

unethical to implement in this area of research (Salthouse, 2006). We therefore used a state-of-the-art methodological approach, propensity score matching, and combined it with longitudinal data collected over five years, which allows for more confident conclusions with regard to causality than traditional approaches (Connelly et al., 2013). In this regard, our study may serve as an example for future studies that aim to examine the effects of naturally occurring group memberships on personal development as well as work and career outcomes.

Second, the time span of five years between the first and the last measurement wave used in the present study was arbitrary and lacks a solid theoretical justification (Sonnentag, 2012). To date, a theoretically driven estimation of what time span should be used when investigating reciprocal influences between personality and work experiences does not exist (Mitchell & James, 2001; Woods et al., 2013). Increased theorizing on the role of time for reciprocal relationships between personality and work experiences is thus needed. Future research could vary the time span under investigation and especially focus on the question of whether the reciprocal relationships between personality and job changes reported in this paper are sustained over time and additional measurement waves.

Third, the conceptualization and operationalization of upward job changes into managerial and professional positions used in this study may be criticized. Due to our focus on such upward job changes, we did not provide any information on the reciprocal influences between personality and other forms of job mobility. Researchers have classified different types of job mobility into job changes, organizational changes, and occupational changes (Feldman & Ng, 2007). Thus, our operationalization may miss other important aspects of career-related changes. With our current data, we were also not able to investigate lateral job changes, such as taking on a similar job at a different organization, and we were not able to distinguish between voluntary and involuntary changes and between intra-organizational and inter-organizational changes. Future research could take a more fine-grained approach to

allow more precise conclusions concerning the reciprocal relationships between personality and these types of career-related changes.

Fourth, our study does not provide insights into the mechanisms through which personality characteristics impact upward job changes into managerial and professional positions and vice versa. For example, the effect of openness to experience on upward job changes into managerial and professional positions may be driven by the fact that open individuals initiate certain occupational changes based on their disposition, or organizational decision makers may regard them as especially well-suited for creative tasks and select them based on those changes. The effect of upward job changes into managerial and professional positions on openness to experience could also be driven by different factors, such as using a larger variety of skills on the job, training opportunities, exposure to organizational decision-makers, leadership tasks, and international job experiences. Future studies should aim at identifying potential mechanisms that may explain the reciprocal relationships between personality and upward job changes into managerial and professional positions.

4.6 Conclusion

In the present study, we investigated reciprocal relationships between the Big Five personality characteristics and upward job changes into managerial and professional positions. Using a large longitudinal dataset, we showed that employees' openness to experience not only predicted such job changes, but that the experiences made in managerial and professional positions also led to changes in this personality characteristic over time. These findings contribute to an emerging area in the literatures on career development and personality development by offering a dynamic perspective on the role of personality in the context of work and careers.

5 The Effects of Unemployment and Reemployment on Locus of Control and Health[7]

While unemployment is associated with a number of negative outcomes, reemployment has been found to mitigate some of those consequences. However, our understanding of the underlying mechanisms through which these results occur is still limited. In the present study, we build on the stress process model (Pearlin et al., 1981) to investigate whether locus of control plays a central role in explaining the processes following both unemployment and reemployment. Propensity score matching and subsequent structural equation models were applied to a longitudinal sample of 7,908 individuals from the SOEP. Our results suggest that unemployment and strains indeed predict decreases in individuals' internal locus of control, which subsequently affect health. Gaining reemployment, however, reverses this process by restoring internal control beliefs. The results thus offer support for the notion that the stress process model does not only explain the negative consequences of unemployment, but that a reversal of the model can also disclose how the positive outcomes of reemployment unfold. Our findings furthermore add to the current literature investigating the role of work-related experiences in shaping personality traits over time.

5.1 Introduction

Unemployment is not only related to negative effects for governments having to bear the costly benefits provided to the unemployed and lost revenues from taxes (Fraser & Sinfield, 1985), it is also considered one of the most stressful life events individuals can possibly encounter in the world of work (Holmes & Rahe, 1967). Job loss has been found to increase strain (Whelan, 1992), is related to a number of adverse health outcomes (Jin, Shah, & Svoboda, 1995), and can cause psychiatric problems such as depression and substance abuse (Dooley, Fielding, & Levi, 1996). The first aim of the present study is to shed light on the underlying processes through which unemployment leads to those unfavorable outcomes.

[7] This chapter is based on Nieß and Biemann (2014), under review at the *Journal of Organizational Behavior*.

Building on the well-established stress process model (Pearlin et al., 1981), we investigate whether individuals' locus of control (Rotter, 1954) can help explain how the negative effects of unemployment unfold.

Locus of control is a personality trait referring to the degree to which individuals believe that events depend on their own behavior and personal characteristics (internal locus of control) versus luck, fate, or powerful others (external locus of control). Although personality traits are commonly regarded as stable inter-individual dispositions (West & Graziano, 1989), research has recently suggested that certain life-events (Specht et al., 2011) and even work-related experiences have the potential of evoking changes in individuals' personality traits (for an overview, see Woods et al., 2013). In the present study, we suggest that job loss may likewise affect individuals' locus of control, a proposition that can be derived from the stress process model (Pearlin et al., 1981). The model suggests, amongst others, that stressful life events diminish individuals' positive self-concepts both directly and through increased strain. We expand the authors' conceptualization of self-concept and investigate whether job loss is a stressful life event that is salient enough to likewise shape individuals' locus of control. We furthermore test the model's proposition that those diminished self-concepts in turn lead to the adverse health outcomes commonly following unemployment. By applying the stress process model to the event of job loss, we thus aim to shed light on the role of locus of control in explaining the negative consequences of unemployment.

While unemployment constitutes a likely threat to individuals' control beliefs and health, reemployment has the potential of reducing some of the negative effects following job loss (Gordo, 2006; Kessler, Turner, & House, 1989; Vinokur, Price, Caplan, van Ryn, & Curran, 1995). For example, reemployment has been found to restore the level of mental health that was present prior to unemployment (Vinokur & Schul, 2002). Insights into the

processes underlying those positive effects of reemployment are, however, even scarcer than studies investigating the mechanisms through which job loss exerts its negative consequences. Therefore, the second aim of the present study is to address this gap by investigating whether locus of control also plays a role in explaining the beneficial consequences of reemployment. More particularly, we examine whether the negative effects of unemployment posited in the stress process model are reversed when individuals gain reemployment. In doing so, we investigate whether reemployment has the potential of restoring individuals' locus of control and subsequently lead to increased levels of health. We thus shed light on the question of whether the negative outcomes of unemployment persist over time, or whether reemployment can foster the recovery of internal control beliefs and health.

The goal of the present study is thus to build on the stress process model (Pearlin et al., 1981) in explaining how the negative consequences of unemployment on the one hand and the positive outcomes of reemployment on the other hand unfold. We focus on the role of locus of control in those processes, thereby adding to the recent literature that investigates how work-related experiences can shape personality over time. The present study is structured as follows. In the following section, we will develop our hypotheses concerning the effect of unemployment and reemployment on subsequent locus of control. We continue by describing our research methodology before turning to the results of our analyses. In the final section, we will describe the contributions and limitations of our study and outline possible avenues for further research.

5.2 Theory

5.2.1 The Effect of Unemployment on Locus of Control

Job loss is a profound event whose negative effects have received much research attention. Health outcomes are particularly well-studied in the unemployment literature, with

studies showing that job loss increases levels of anxiety (Linn, Sandifer, & Stein, 1985) and depressive affect (Murphy & Athanasou, 1999), while it impairs physical functioning (Gallo, Bradley, Siegel, & Kasl, 2000) and changes cardiovascular risk factors (Arnetz, et al., 1991). In an attempt to identify underlying processes through which unemployment exerts those negative consequences, scholars have put forward a number of theoretical models, one of which is the stress process model (Pearlin et al., 1981). It is one of the most established theoretical models for explaining the negative consequences of stressful life events and focusses on individuals' self-concept in dealing with such events. Therefore, it is particularly well-suited for studying the role of control beliefs, which are closely related to individuals' self-concept, in the processes following the negative life event of job loss. In short, the model suggests that negative life events, such as job loss, can intensify strains. Negative life events and strains converge as sources of stress, which in turn result in a degradation of individuals' self-concept, more particularly in a reduced sense of mastery and depleted self-esteem. The diminished self-concepts that unemployment provokes then eventually result in health-related problems.

In the present study, we argue that individuals' self-concepts, which consist of mastery and self-esteem and play a central role in the stress process model, may also be conceptualized in terms of locus of control. According to the original model, mastery "refers to the extent to which people see themselves as being in control of forces that importantly affect their lives" (Pearlin et al., 1981, p. 340), while self-esteem involves evaluating one's own worth. An internal locus of control has likewise been described as self-mastery and a sense of self-efficacy (Legerski, Cornwall, & O'Neil, 2006). Individuals with an internal locus of control believe that they have control over events that affect them (Rotter, 1954), which is also a defining characteristic of mastery. In the present study, we thus aim to test the stress process model's applicability to the event of job loss when self-concepts are

conceptualized as locus of control beliefs rather than mastery and self-esteem. In doing so, we first review the evidence for an effect of unemployment on locus of control and shed light on the potentially mediating role of strain. We then consider the relationship between unemployment and health and investigate whether it may be mediated by locus of control.

The notion that unemployment may change individuals' locus of control has received considerable empirical support, showing that individuals who become unemployed have a less internal locus of control than those who remain employed (Goldsmith, Veum, & Darity, 1996; Layton, 1987; O'Brien & Feather, 1990). The finding can be explained by the theory of learned helplessness (Seligman & Maier, 1967), which suggests that experiences which are perceived as uncontrollable leave individuals with a sense of helplessness. Such experiences can foster passivity, retard learning to respond to the situation, and cause emotional stress (Seligman, 1972). If unemployment is perceived as an uncontrollable event by those affected, their sense of helplessness is likely to manifest itself in the belief that their current situation is not under their own control (Goldsmith et al., 1996). Consequently, they may perceive that they likewise have no means of controlling future events. Due to the experience of unemployment, individuals may thus experience helplessness, leaving them with a more external and less internal locus of control than before their job loss.

Hypothesis 1a: Unemployment negatively predicts locus of control.

On the basis of the stress process model (Pearlin et al., 1981), the effect of unemployment on locus of control is likely to be mediated through strain. It is hard to argue that job loss is generally accompanied by increased strain, economic strain in particular (Whelan, 1992). This strain may confront people with their lack of success in the world of work, leading them to regard the increased strain as a sign for their inability to change undesirable life circumstances and their inadequacy to solve economic problems (Pearlin et al., 1981). Given these circumstances, individuals may be prone to not only suffer from

damages in self-esteem and sense of mastery as suggested by the stress process model, but also to adapt a more external locus of control. Financial strain as a result of job loss has furthermore been suggested as an impediment to individuals' desire for self-directedness (Fryer & Payne, 1986), which also hints towards a relation between strain and reduced levels of internal control beliefs.

Hypothesis 1b: The negative effect of unemployment on locus of control is mediated by strain.

The negative impact of job loss on health is well-documented in an array of reviews (Dooley et al., 1996; Jin et al., 1995; Mathers & Schofield, 1998; Warr, 1987), research articles (Arnetz et al., 1991; Gallo et al., 2000; Linn et al., 1985; Murphy & Athanasou, 1999), and meta-analyses (McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Paul & Moser, 2009). In the framework of the stress process model (Pearlin et al., 1981), unemployment and strain constitute sources of stress, while impaired health outcomes represent manifestations of those stressors. This explanation overlaps with other renowned theoretical models examining the relationship between unemployment and health, such as the *latent deprivation model* (Jahoda, 1981). Just like the stress process model, the latent deprivation model also focusses on unemployment as a cause of distress, which in turn results in reduced levels of mental and physical health (Paul & Moser, 2009).

Hypothesis 1c: Unemployment negatively predicts health.

What remains far less studied than the association between unemployment and health are the relationship's underlying mechanisms. According to the stress process model (Pearlin et al., 1981), the effect of job loss on health is mediated by individuals' self-concepts, a conceptualization that has been extended in the present study to include locus of control. The notion that individuals with a more internal locus of control may deal better with unemployment and thus experience weaker effects of job loss on health has already found

empirical support (Krause & Stryker, 1984; Price, Choi, & Vinokur, 2002). It can be explained by the proposition that internals have a different appraisal of their job loss than externals. More specifically, individuals with a more internal locus of control believe that they have the power of changing the undesirable situation of unemployment by gaining reemployment, so that they are likely to feel less stressed by the situation of unemployment than individuals with a more external locus of control.

Hypothesis 1d: The negative effect of unemployment on health is mediated by locus of control.

5.2.2 The Effect of Reemployment on Locus of Control

While theoretical models such as the stress process model (Pearlin et al., 1981) provide potential explanations for the negative effects of unemployment, little is still known on the theoretical underpinnings explaining the positive effects of reemployment. In order to advance theory in this regard, we apply a reversed version of the stress process model to the event of reemployment. More particularly, we investigate whether a reversal of the effects proposed in the stress process model takes place when individuals gain reemployment. Such a turnaround of the model would suggest that the positive life-event of gaining reemployment leads to an elevation of individuals' self-concepts and, in the framework of the present study, to a more internal locus of control, both directly and through decreased strains. Furthermore, it would suggest that by gaining a more internal locus of control, health-related outcomes are also improved. Applying such a reversed version of the stress process model to the outcomes of reemployment may provide an explanation for the positive effects of reemployment on individuals' health (Vinokur & Schul, 2002).

The authors of the stress process model parenthetically touch on the possibility that individuals successfully deal with initial stressors and state that "successful encounters with […] problems might enhance the self" (Pearlin et al., 1981, p. 345). Applied to the context of

this study, individuals who are faced with the negative event of job loss may suffer from increased strains and consequently from devaluations of the self, which may become evident in more external locus of control beliefs. When they, however, gain reemployment, those strains are decreased and people are again integrated in the workforce, allowing them to better solve their economic problems. They may be prone to an increase in locus of control because they have successfully coped with the situation by finding reemployment. Research in the domain of psychotherapy has indeed found that when individuals successfully cope with immediate difficulties, they are more likely to experience an increase in internal locus of control (Lefcourt, 1972). Furthermore, Ginexi, Howe, and Caplan (2000), find that permanent, full-time reemployment obtained five month after job loss has a small, but statistically significant positive effect on subsequent internal locus of control. In sum, it is thus likely that reemployment indeed reversed the negative effects of unemployment on strain and subsequent locus of control.

Hypothesis 2a: Reemployment positively predicts locus of control.

Hypothesis 2b: The positive effect of reemployment on locus of control is mediated by strain.

A reversal of the stress process model in response to reemployment would furthermore suggest that the positive life-event of reemployment leads to desirable health-related outcomes, and that this relationship may be mediated by increases in internal locus of control. Research has indeed suggested that reemployment predicts declines in depressive symptoms (Ginexi et al., 2000).[8] When individuals gain reemployment, this may cancel out the stressful experience of unemployment, so that the manifestation of stress in the form of health-related problems is abolished and possibly even reversed. This process may be mediated by changes in locus of control, a notion that is supported by the fact that locus of

[8] In Germany, a positive effect of reemployment on health cannot be attributed to the fact that only employed individuals have access to medical care, since employed and unemployed individuals are treated in the same health care system.

control has similarly been examined as a potential mediator of the relationship between unemployment and health-related outcomes (Feather & O'Brien, 1986). Mastery, which is closely related to the concept of internal locus of control, has furthermore been shown to have positive effects on individuals' health (Vinokur, Schul, Vuori, & Price, 2000). One may thus argue that reemployment could positively affect health-related outcomes and that this relation may be mediated by locus of control.

Hypothesis 2c: Reemployment positively predicts health.

Hypothesis 2d: The positive effect of reemployment on health is mediated by locus of control.

5.3 Methods

5.3.1 Sample

We used data from the SOEP, a representative longitudinal survey of the adult population living in private households in Germany (Wagner et al., 2007). It has been conducted annually since 1984 and includes a sample size of roughly 20,000 individuals each year. For answering the research questions addressed in this study, the SOEP provides a number of advantages. First, due to its longitudinal structure, it is possible to investigate the effect of unemployment and reemployment on *subsequent* locus of control while also controlling for initial levels of locus of control, rather than measuring all variables at the same point in time. Second, the SOEP data overcomes limitations of previous studies, which rely mainly on samples where participants are already unemployed at the time of the first observation (Ginexi et al., 2000; Waters & Moore, 2002) or make use of samples of students or displaced workers only (Layton, 1987; O'Brien & Feather, 1990; Winefield & Tiggemann, 1990). Third, using the SOEP allows controlling for a large number of other variables that may influence the relationships proposed between the variables of interest.

Since data on locus of control was available for the years 1999, 2005, and 2010, the waves 1999 – 2010 were chosen for the statistical analyses. Only individuals for whom information on locus of control and employment status was available were included in the sample. This resulted in a sample of 7,908 individuals, 5,383 of those being male and 2,525 being female. The mean age of the sample was 37.75 in the wave of 1999 (*SD* = 10.60).

5.3.2 Measures

We extracted variables of waves 1999 through 2010 from the SOEP for answering the research questions of the present study. For answering the first research question, which is concerned with the effect of unemployment on subsequent locus of control, we made use of data from waves 1999 through 2005. This allowed us to control for initial levels of locus of control assessed in 1999 when investigating the effect of unemployment on subsequent locus of control in 2005. For the second research question, which pertains to the effect of reemployment on locus of control, waves 2005 through 2010 were used. Again, we were therewith able to control for initial levels of locus of control in 2005 when examining the effect of reemployment on locus of control in 2010. By dividing the timeframe into two distinct periods for both research questions, we were furthermore able to conduct robustness checks in the respectively different time periods. The syntax for extracting the variables can be obtained from the authors upon request.

Unemployment. Individuals who were employed in 1999, but became unemployed at some point in time between 2000 and 2005 were coded as having become unemployed (1). If they, however, remained employed from wave 1999 through wave 2005, they were coded as not having become unemployed (0). Since robustness checks investigating the consequences of unemployment were also conducted in the timeframe of waves 2005 through 2010, the same operationalization of unemployment was used for that timeframe. In the timeframe of 2005 through 2010, individuals who were employed in 2005, but became unemployed at

some point in time between 2006 and 2010 were coded as having become unemployed (1). If they, however, remained employed from wave 2005 through wave 2010, they were coded as not having become unemployed (0).

Reemployment. Individuals who were unemployed in 2005, but became reemployed at some point in time between 2005 and 2010 and were still employed in 2010 were coded as having become reemployed (1). If they, however, remained unemployed from wave 2005 through wave 2010, they were coded as not having become reemployed (0). For robustness checks, the same operationalization was used for waves 1999 through 2005. More particularly, individuals who were unemployed in 1999, but became reemployed at some point in time between 2000 and 2005 and were still employed in 2005 were coded as having become reemployed (1). If they, however, remained unemployed from wave 1999 through wave 2005, they were coded as not having become reemployed (0).

Locus of Control. Although individuals are often classified as internals or externals, research suggests that the concept should not be viewed as dichotomous, but as a bipolar continuum ranging from highly internal to highly external (Marsh & Richards, 1986). In the present article, internal and external loci of control are therefore regarded as the extremes on a one-dimensional scale rather than as two independent dimensions. The SOEP included the same ten items in the three waves of 1999, 2005, and 2010 to measure respondents' locus of control. In 1999, those items were rated on a 4-point Likert scale ranging from 1 (*totally agree*) to 4 (*totally disagree*). In 2005 and 2010, the same ten items were measured on a 7-point Likers scale ranging from 1 (*does not apply*) to 7 (*does apply)*. For all three waves, items phrased in a way to indicate external locus of control were reversed in their coding so that a higher score now represents a higher internal locus of control (Table 5.1). Confirmatory factor analyses were then conducted via AMOS (Arbuckle, 2003) to assess whether all ten items loaded sufficiently strong on the latent variable locus of control for all three waves.

Results indicated that there were three items (4, 6, and 9) in all three waves that loaded weakly on the latent factor. This result is in line with the SOEP scales manual (Richter, Metzing, Weinhardt, & Schupp, 2013), which suggests excluding those three items from the scale. When we followed that recommendation and excluded items 4, 6, and 9 from the scales, this indeed resulted in a significantly better fit of the measurement models in all three waves ($\Delta X^2(21) = 441.89$, $p < .001$ for 1999; $\Delta X^2(21) = 1{,}130.04$, $p < .001$ for 2005; $\Delta X^2(21) = 1{,}128.58$, $p < .001$ for 2010; see Table 5.1). Locus of control was thus entered into the analyses as a latent variable measured by the remaining seven items in each of the three waves, which has already been done in previous studies (Heidemeier & Göritz, 2013; Specht, Egloff, & Schmukle, 2012).

Table 5.1: Confirmatory Factor Analyses for Locus of Control

		Locus of Control 1999		Locus of Control 2005		Locus of Control 2010	
	Item	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
1	My life's course depends on me.	.35***	.34***	.38***	.38***	.40***	.40***
2	I haven't achieved what I deserve. (R)	.50***	.50***	.47***	.47***	.51***	.51***
3	What you achieve depends on luck. (R)	.44***	.44***	.46***	.46***	.46***	.46***
4	Influence on social conditions through involvement.	-.06**		-.04**		.03*	
5	Others make the crucial decisions in my life. (R)	.61***	.62***	.61***	.61***	.61***	.62***
6	Success takes hard work.	.08***		.10***		.07***	
7	Doubt my abilities when problems arise. (R)	.56***	.56***	.50***	.50***	.53***	.53***
8	Possibilities are defined by social conditions. (R)	.25***	.35***	.39***	.39***	.39***	.39***
9	Abilities are more important than effort. (R)	.03		.06***		.09***	
10	Little control over my life. (R)	.65***	.65***	.68***	.68***	.70***	.70***
X^2		527.29	85.40	1434.16	304.12	1497.02	368.44
df		35	14	35	14	35	14
CFI		.88	.98	.82	.96	.81	.95
RMSEA		.04	.03	.07	.05	.07	.06
ΔX^2			441.89***		1,130.04***		1,128.58***

Note. R = reverse scored item. *CFI* = comparative fit index; *RMSEA* = root mean square error of approximation.
* $p < .05$. ** $p < .01$. *** $p < .001$

Strain. Since unemployment is associated with financial drawbacks, strain was operationalized as the difference in individuals' monthly income in Euro (wages or salary and unemployment benefits, respectively) before and after unemployment. For robustness checks, we furthermore made use of a variable assessing respondents' appraisals of strain. More specifically, respondents were asked on a three-point Likert scale how worried they were about their financial situation, with answers ranging from 1 (*very concerned*) to 3 (*not concerned at all*). Answers were reversed in their coding so that higher numbers indicated more strain.

Health. Subjects were asked to describe their current health in waves 1999, 2005, and 2010 on a scale from 1 (*very good*) to 5 (*bad*). Answers were reversed in their coding so that higher numbers indicated better health. In order to validate our operationalization of health, it was investigated how strongly respondents' perceived health correlated with other more objective health-related indicators of the SOEP. We found that perceived health correlated negatively with the number of visits to the doctor per year (r = -.33, p < .001), the number of nights spent in hospital per year (r = -.25, p < .001), whether or not individuals were on sick leave for more than six weeks in a row (r = -.20, p < .001), whether or not individuals are severely disabled (r = -.35, p < .001), and their percentage of being legally handicapped (r = -.28, p < .001). We furthermore found that those objective health-related indicators of health explained 21.8 % in the variance of respondents' perceived health. All the objective factors, however, only capture single aspects of health and are partly not fitting for the purpose of this study, since indicators such as being severely disabled or handicapped are unlikely to be affected by one's control beliefs. Since perceived health is, however, significantly related to other indicators of health, we concluded that perceived health was the most fitting indicator of health for the purpose of this study.

Control Variables. In all analyses reported below, three sets of control variables were controlled for. First, we controlled for demographic variables, such as respondents' age, gender (0 = male; 1 = female), marital status (0 = not married; 1 = married), nationality (0 = *not German; 1 = German*), and education (0 = *no school degree* to 4 = *upper secondary degree*). Second, we controlled for respondents' employment situation prior to job loss and reemployment, respectively for the two timeframes. This set of variables included job satisfaction (0 = *not satisfied* to 10 = *very satisfied*), income satisfaction (0 = *not satisfied* to 10 = *very satisfied*), and tenure before job loss and accordingly time in unemployment before gaining reemployment. Third, respondents' employment history, namely the time they have ever spent in employment and in unemployment, was controlled for.

5.3.3 Statistical Analyses

In a first step, we treated the missing values, which ranged from 0 % to 16.8 %, making use of estimation maximization (Schafer & Graham, 2002). This method follows a maximum likelihood estimation approach in which missing values are imputed with maximum likelihood values and has been suggested for imputing missing data in structural equation models (Enders & Bandalos, 2001).

In a second step, we employed propensity score matching (Connelly et al., 2013; Rosenbaum & Rubin, 1983) using the MatchIt software package (Ho et al., 2011) for SPSS. This statistical method has been suggested as the method of choice when estimating causal effects of group membership on the basis of observational data (Harder et al., 2010). When participants cannot be randomly assigned to experimental conditions such as employment statuses, a comparison between those experimental conditions may be distorted (Dehejia & Wahba, 2002). Propensity score matching aims at reducing this bias by pairing participants from the different experimental conditions who are similar in terms of certain pre-defined covariates. It has been used in previous studies for estimating changes in personality traits

situations (Jonkmann et al., 2014) and for assessing, amongst others, the effects of labor market programs (Sianesi, 2004), special education interventions in schools (Morgan, Frisco, Farkas, & Hibel, 2010), and antipoverty programs (Jalan & Ravallion, 2003). For both timeframes (1999 to 2005 and 2005 to 2010), we estimated the propensity score for each participant, which is a measure of the likelihood of a person's group membership given the observed covariates. In our case, those covariates included the control variables reported above, namely a set of demographic variables (age, gender, marital status, nationality, education), indicators of individuals' employment situation prior to unemployment and reemployment (satisfaction with work, satisfaction with income, tenure and time in unemployment), and individuals' employment history (number of months ever spent in employment, number of months ever spent in unemployment). We then matched participants from both groups (unemployment versus no unemployment in waves 1999 – 2005; reemployment versus no reemployment in waves 2005 – 2010) using a 1:1 nearest neighbor matching with replacement. We imposed a caliper of .20 of the standard deviation of the propensity score's logit, which has been proposed as the optimal caliper width in propensity score matching (Austin, 2011), to avoid matches of very diverging propensity scores. This procedure resulted in a two distinct samples for the two timeframes 1999 – 2005 and 2005 – 2010. In the first timeframe, individuals who became unemployed were matched to individuals who remained employed, resulting in a sample of N = 798. In the second timeframe, we matched individuals who became reemployed to individuals who remained unemployed, which resulted in a sample of N = 289.

In a third step, after the propensity score matching procedure, we made use of structural equation modeling in both timeframes, using the AMOS 22 software (Arbuckle, 2003). Since the control variables were already accounted for through the propensity score matching, they were not included again in the structural equation model. Structural equation

modeling is a useful method in mediation analysis, as it allows for the inclusion of latent constructs and enables estimating several relationships between variables simultaneously (Baron & Kenny, 1986; Cole & Maxwell, 2003). Furthermore, it is possible to conduct model comparisons to estimate which one of several competing models fit the data best. We made use of several measures to assess model fit (Hu & Bentler, 1999): First, we used X^2, where a non-significant X^2 value indicates good model fit. Second, we made use of the *comparative fit index (CFI)*, where a value of .90 or higher indicates good model fit. Third and fourth, the *standardized root-mean-square error of approximation (RMSEA)* with a cut-off of .06 or lower, and the *standardized root-mean-square residual (SRMR)* with a cut-off of .08 or lower were used. Since the X^2 test is very sensitive to sample size (Hooper, Coughlan, & Mullen, 2008), we, however, focused on the later three fit indices to estimate model fit.

5.4 Results

The means, standard deviations, and correlations of the variables included in this study can be found in Table 5.2 for waves 1999 through 2005 and in Table 5.3 for waves 2005 through 2010.

Table 5.2: Means, Standard Deviations, and Correlations among the Studied Variables in Waves 1999 – 2005

		M	*SD*	1	2	3	4
1	Unemployment	.88	.33				
2	Locus of Control 1999	2.87	.47	-.06			
3	Locus of Control 2005	4.46	1.01	-.12**	.45***		
4	Strain	-8.64	1067.98	.12***	-.02	-.10**	
5	Health	3.25	.92	-.08*	.15***	.24***	-.16***

Note. N = 798. Locus of Control in 1999 and 2005 are displayed as the scale means in this table.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5.3: Means, Standard Deviations, and Correlations among the Studied Variables in Waves 2005 – 2010

		M	*SD*	1	2	3	4
1	Reemployment	.79	.41				
2	Locus of Control 2005	4.38	.97	.15*			
3	Locus of Control 2010	4.56	.99	.16**	.34***		
4	Strain	-16.77	813.81	-.14*	-.11	-.11	
5	Health	3.39	.87	.19**	.19**	.16**	-.15**

Note. N = 289. Locus of Control in 2005 and 2010 are displayed as the scale means in this table.
* $p < .05$. ** $p < .01$. *** $p < .001$.

5.4.1 The Effect of Unemployment on Locus of Control

We tested the hypothesized relationships in a structural equation model (see Table 5.4). In model 1a (M1a), the direct effect model, we tested Hypothesis 1a, which states that unemployment negatively predicts locus of control. This model therefore only included the direct effect of unemployment on subsequent locus of control. Results indicated an acceptable model fit ($X^2(20) = 81.94$, $p < .001$; *CFI* = .92; *RMSEA* = .06; *SRMR* = .04) and the standardized regression coefficient showed that the relation between unemployment and subsequent locus of control was statistically significant (β = -.14, p = .001), thus offering support for Hypothesis 1a.

To test Hypothesis 1b, which states that the negative effect of unemployment on locus of control is mediated by strain, we added strain as a potential mediator of the unemployment and locus of control relationship to the model (M1b). Results (Table 5.4) indicated that the mediation model fit the data well ($X^2(26) = 86.57$, $p < .001$; *CFI* = .92; *RMSEA* = .05; *SRMR* = .04) and that it is not significantly worse than the previous model ($\Delta X^2(6) = 4.63$, p = .592). The path coefficients furthermore indicated that unemployment indeed positively predicted strain (β = .12, $p < .001$), while strain in turn negatively predicted locus of control (β = -.10, p = .022). The direct effect of unemployment on locus of control was negative and statistically significant (β = -.12, p = .011), while the indirect effect was also negative and marginally significant (β = -.01, p = .055). Results thus offer some support for Hypothesis 1b, suggesting

that the negative effect of unemployment on locus of control is at least partly mediated by strain.

Table 5.4: Structural Equation Models for Timeframe 1999 – 2005

		X^2	*df*	*CFI*	*RMSEA*	*SRMR*	ΔX^2 to previous model	*df*
M1a	Direct effect of unemployment of LoC	81.94***	20	.92	.06	.04		
M1b	Mediation via strain	86.57***	26	.92	.05	.04	4.63	6
M1c	Direct effect of unemployment on health	166.34***	43	.88	.06	.07		
M1d	Mediation via LoC	130.87***	42	.91	.05	.05	35.47***	1

Note. $N = 789$.
*** $p < .001$.

To test Hypothesis 1c, which states that unemployment negatively predicts health, we added health as a dependent variable to model M1b, resulting in model M1c. We also included health prior to the unemployment experience to the model as a control variable. Results (Table 5.4) suggest that the model does not fit the data particularly well ($X^2(43) = 166.34$, $p < .001$; *CFI* = .88; *RMSEA* = .06; *SRMR* = .07). The standardized path coefficient of unemployment on health is furthermore only marginally significant ($\beta = -.06$, $p = .059$). Results thus indicate only partial support for Hypothesis 1c.

Hypothesis 1d, stating that the negative effect of unemployment on health is mediated by locus of control, was again tested by adding the potential mediator, namely locus of control, to the previous model M1c, resulting in model M1d. Results (Table 5.4) indicated that including the locus of control to the model as a mediator significantly improved model fit ($\Delta X^2(1) = 35.47$, $p < .001$) and provided good fit of the model with the data ($X^2(42) = 130.87$, $p < .001$; *CFI* = .91; *RMSEA* = .05; *SRMR* = .05). The standardized regression coefficients further indicated that the path from unemployment to health was not statistically significant ($\beta = -.03$, $p = .33$) when locus of control was included as a mediator of that relationship. The

indirect effect of unemployment on health was, however, negative and statistically significant (β = -.03, p = .010). More specifically, unemployment negatively and significantly predicted locus of control (β = -.12, p = .011), while locus of control in turn predicted health (β = .23, p = .005). The results thus offer support for Hypothesis 1d, suggesting that the negative effect of unemployment on health is mediated by locus of control. The whole research model, including Hypotheses 1a through 1d, can be found in Figure 5.1.

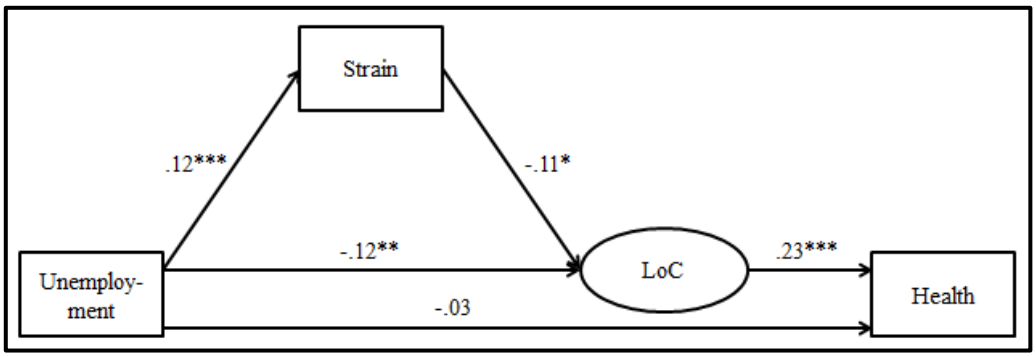

Figure 5.1: Final structural equation model for timeframe 1999 – 2005.
** p < .05. ** p < .01. *** p < .001.*

5.4.2 The Effect of Reemployment on Locus of Control

Hypotheses 2a through 2d were again tested through structural equation models, which were conducted on the basis of the matched sample (see Table 5.5). Hypothesis 2a, suggesting that reemployment positively predicts locus of control, was tested in the direct effect model (M2a), which included only the direct effect of reemployment on locus of control. Results (Table 5.5) indicated satisfactory model fit (X^2(20) = 42.20, p = .003; *CFI* = .93; *RMSEA* = .06; *SRMR* = .05) and the standardized regression coefficient was positive and significant (β = .16, p = .017), thus offering support for Hypothesis 2a.

In order to test Hypothesis 2b, which states that the relationship between reemployment and locus of control is mediated by strain, it was again tested by adding strain to the previous model, resulting in model M2b. Results (Table 5.5) indicated that the mediation model had good fit (X^2(26) = 47.64, p = .006; *CFI* = .94; *RMSEA* = .05; *SRMR* = .05) and did not fit the data significantly worse than the previous model (ΔX^2(6) = 5.44). The

standardized regression coefficients further showed all path coefficients were at least marginally significant. More specifically, reemployment negatively and significantly predicted strain (β = -.14, p = .018), strain in turn had a marginally significant effect on locus of control (β = -.11, p = .094), while the direct effect of reemployment on locus of control was still significant (β = .15, p = .032). The indirect effect of reemployment on locus of control was positive and marginally significant (β = .02, p = .084). Results thus offer some support for Hypothesis 2b, suggesting that the positive effect of reemployment on subsequent locus of control is at least partially mediated by strain.

Table 5.5: Structural Equation Models for Timeframe 2005 – 2010

		X^2	*df*	*CFI*	*RMSEA*	*SRMR*	ΔX^2 to previous model	*df*
M2a	Direct effect of reemployment on LoC	42.20**	20	.93	.06	.05		
M2b	Mediation via strain	47.64**	26	.94	.05	.05	5.44	6
M2c	Direct effect of reemployment on health	87.96***	43	.90	.06	.07		
M2d	Mediation via LoC	84.16***	42	.91	.06	.06	$3.80^{(*)}$	1

Note. N = 289.
$^{(*)}$ $p < .10$. ** $p < .01$. *** $p < .001$.

Hypothesis 2c states that reemployment positively predicts health and was tested by adding health to model 2b. In this model (M2c), we included a direct path from reemployment to subsequent health while also controlling for initial levels of health. Results (Table 5.5) indicated that this model barely achieved a good fit ($X^2(43) = 87.96$, $p < .001$; *CFI* = .90; *RMSEA* = .06; *SRMR* = .07). The direct effect of reemployment on health was marginally significant (β = .09, p = .077). In sum, results thus offer partial support for Hypothesis 2c.

In order to test Hypothesis 2d, suggesting that the positive effect of reemployment on health is mediated by locus of control, we again included locus of control as a mediator

between reemployment and health in the model (M2d). Results (Table 5.5) indicated a good fit of the mediation model with the data ($X^2(42) = 84.16$, $p < .001$; *CFI* = .91; *RMSEA* = .06; *SRMR* = .06), with a marginally significantly better fit than the model that had not included locus of control as a mediator ($\Delta X^2(1) = 3.80$, $p = .051$). We found that the direct effect of reemployment on health did not reach statistical significance ($\beta = .07$, $p = .152$) when locus of control served as a mediator of that relationship. The indirect effect of reemployment on health was, however, positive and statistically significant ($\beta = .02$, $p = .036$). The relationship between reemployment and locus of control ($\beta = .15$, $p = .032$) and between locus of control and health ($\beta = .12$, $p = .051$) were both (marginally) statistically significant. Results thus offer support for Hypothesis 2d, suggesting that the relationship between reemployment and health is mediated by locus of control. The whole research model, including Hypotheses 2a through 2d, can be found in Figure 2.

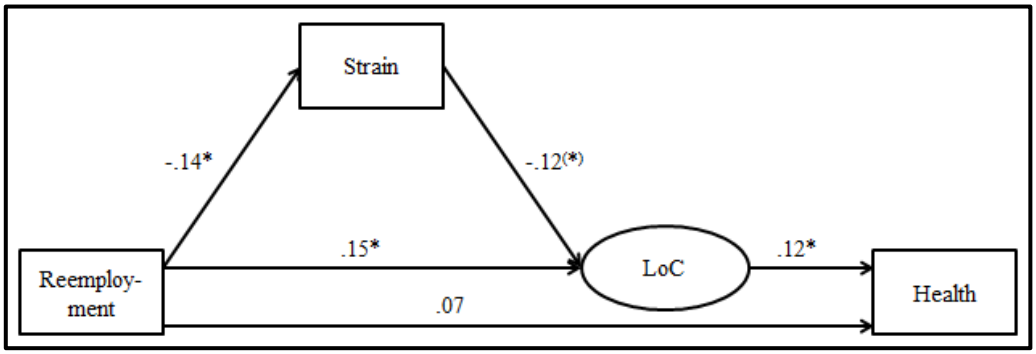

Figure 5.2. Final structural equation model for timeframe 2005 – 2010.
*$^{(*)}$ $p < .10$. * $p < .05$.*

5.4.3 Robustness Checks

A number of robustness checks were conducted in order to investigate whether results obtained in the initial analyses were stable. First, the results obtained for the effects of unemployment and reemployment on subsequent locus of control were cross-validated in the other timeframe respectively. More particularly, we investigated the effect of unemployment on locus of control in the timeframe of 2005 to 2010 and the effect of reemployment on locus of control in the timeframe of 1999 to 2005. We again made use of propensity score matching

first and then conducted all analyses based on the resulting matched sample in AMOS. For the effect of unemployment on locus of control between 2005 and 2010, we found that results strongly resembled those of the initial analyses conducted in the timeframe 1999 to 2005. The final model (compare to model M1d, Table 5.4 and Figure 5.1) had similarly good fit ($X^2(42) = 150.00$, $p < .001$; *CFI* = .91; *RMSEA* = .05; *SRMR* = .06). For the effect of reemployment on locus of control between 1999 and 2005, we found that the final model (compare to model M2d, Table 5.5 and Figure 5.2) also had comparably good fit ($X^2(42) = 48.58$; *CFI* = .97; *RMSEA* = .03; *SRMR* = .06). In sum, results of the first robustness check thus indicated that results were similar when using different timeframes for the analyses.

As a second robustness check, we made use of more conservative analyses where we also controlled for initial levels of locus of control in the structural equation models. In the original analyses, locus of control had been controlled for through the propensity score matching procedure as one of the covariates. In this robustness check, we controlled for initial levels of locus of control twice: First in the propensity score matching procedure, and second as a control variable in the structural equation models. The error terms of the locus of control items were allowed to correlate across the two time points of assessment (1999 and 2005 for timeframe 1 and 2005 and 2010 for timeframe 2) For the effect of unemployment on locus of control, adding locus of control in 1999 to the analyses as a control variable did not considerably change the results. The fit indices again indicated good fit ($X^2(125) = 252.71$; *CFI* = .94; *RMSEA* = .04; *SRMR* = .05). For the effect of reemployment on locus of control, we added locus of control in 2005 to the model as a control variable. Again, model fit of this more conservative model was comparably good as the initial model fit ($X^2(125) = 204.37$; *CFI* = .91; *RMSEA* = .05; *SRMR* = .07). Results of this second robustness check thus indicated that with an analytic approach controlling for initial levels of locus of control twice, results remained stable.

A third robustness check was conducted to investigate whether results remain stable when a broader operationalization of strain, going beyond objective financial strain, is used. As described above, the SOEP includes a variable asking respondents how worried they are about their financial situation. That variable was used as an alternative operationalization of strain. Results indicated that for the effect of unemployment on locus of control, including this alternative variable in the model resulted in good fit indices ($X^2(42) = 153.16$; *CFI* = .90; *RMSEA* = .06; *SRMR* = .05) that were similar to the original model. For the effect of reemployment on locus of control, the alternative operationalization of strain also resulted in comparably good model fit ($X^2(42) = 89.31$; *CFI* = .91; *RMSEA* = .06; *SRMR* = .07). In sum, results thus remained stable with a broader, more subjective operationalization of strain.

5.5 Discussion

The aim of the present study was to shed light on the role of locus of control in the processes following unemployment and reemployment. We first applied the stress process model (Pearlin et al., 1981) to the event of unemployment and investigated whether the model can help explain the negative consequences of job loss when it includes locus of control as a conceptualization of self-concept. A reversed version of the model was then applied to the event of reemployment to provide a theoretical explanation for the positive outcomes of reemployment. By doing so, we also strove to add to the recent literature investigating the potential of work-related experiences in shaping personality over time.

According to the stress process model (Pearlin et al., 1981), job loss and the increased strains that follow it accumulate to form a source of stress, which results in diminished self-concepts. The negative health-related outcomes of unemployment can be explained through those diminished self-concepts. The results of the present study suggest that the stress process model is also applicable to the event of job loss when self-concepts are conceptualized as locus of control. More particularly, we find support for the notion that unemployment leads to

decreased levels of internal locus of control, and that this relationship is at least partially mediated by increased strains. Results furthermore indicate that the diminished locus of control can in turn explain the negative effect of unemployment on health. The present study thus brings about findings that are consistent with previous empirical results that have separately investigated the effects of unemployment on strain, on locus of control, and on health, but extends those results by integrating them into the theoretical framework of the stress process model. We thus offer support for the notion that control beliefs play a role in explaining the processes through which the negative effects of unemployment unfold. Furthermore, the present study entails a theoretical explanation for the role of work-related experiences in shaping personality over time and finds support for the notion that those changes in personality also have an effect on broader outcomes, such as health.

Although the stress process model (Pearlin et al., 1981) aims at explaining the outcomes of negative life-events, it was also applied to the positive life-event of gaining reemployment in the present study. More particularly, we investigated whether a reversal of the effects posited in the stress process model takes place when it comes to reemployment. Such a turnaround of the model could provide a theoretical explanation for the finding that reemployment has the potential of reversing some of the negative effects of unemployment. Results of the present study indeed offer support for an applicability of a reversed version of the stress process model to the event of reemployment. We found that when individuals obtained reemployment, this indeed had a positive effect on their internal control beliefs. The relationship between reemployment and locus of control was at least partially mediated by decreased strains. Reemployment furthermore exerted a positive influence on individuals' health, and the process was again mediated by increases in locus of control. The effect sizes, however, suggest that locus of control plays a more important role for individuals' health in the processes following unemployment than in those following reemployment. In sum, our

results thus suggest that a reversed version of the stress process model can help explain the positive outcomes of reemployment, and that locus of control may play a central role in accounting for those outcomes. Again, the findings furthermore suggest that salient experiences in the world of work can have an effect on personality development.

5.5.1 Implications

The results of the present study offer practical implications for designing intervention programs for the unemployed. Our findings suggest that some of the most prominent negative outcomes of unemployment, namely health-related problems, can be explained through decreases in locus of control following job loss. Intervention programs could aim at strengthening individuals' locus of control in order to weaken those negative effects of unemployment on health. Since the present study provides support for the notion that locus of control can potentially be modified, training programs could pursue the goal of elevating internal control beliefs. Given the finding that individuals with high strains are especially vulnerable to decreases in locus of control and subsequent health problems, they may constitute an especially suitable target group for such interventions.

While the practical implications of the present study mainly revolve around intervention programs for unemployed individuals, there are two main theoretical implications. First, our results suggest that the stress process model is not only applicable to the processes following unemployment, but that its reversal can also help explain the outcomes of reemployment. We thus add to the literature by offering a theory-based explication for the positive consequences of reemployment. The findings of the present study more specifically emphasize the role of locus of control as a mediator in the relationship between reemployment and health. Second, our results add to the recent literature investigating the role of work-related experiences in changing personality over time (Woods et al., 2013). We indeed find support for the notion that salient experiences in the world of

work such as job loss or reemployment have the potential of shaping individuals' locus of control. Although those effects are rather small, they challenge the traditional assumption that personality traits are generally stable over time.

5.5.2 Limitations and Avenues for Future Research

The present study is not without its limitations, which, however, offer several avenues for future research. First, we acknowledge that despite the advanced statistical method of propensity score matching, causality cannot be proven on the basis of observational data. Only an experimental research design, which is, however, highly difficult to implement given the research questions, could inevitably demonstrate a causal effect of unemployment and reemployment on subsequent changes in locus of control and health. Second, the SOEP includes a predefined set of questions, which limits the operationalization of the variables included in this study. Future research could aim at replicating the results of the present study with alternative operationalizations. For example, locus of control has been found to differ across different domains (Spector, 1988; Wallston, Wallston, Kaplan, & Maides, 1976), so that it may be feasible to make use of a work or health locus of control scale instead of a general one. Another fruitful approach for future research could be to differentiate between physical and mental health-related outcomes and to operationalize them in a more objective way than has been done in the present study. Third, we base our analyses on a large, representative sample, which, however, only includes respondents who live in Germany. The findings may thus not be generalizable to a larger part of the world population, especially to societies where the economic development is more problematic and unemployment protection systems are less advanced (Paul & Moser, 2009). Future research could benefit from extending the present research questions to different samples. Fourth, our results do not shed light on the drivers underlying the changes in locus of control that we observed. One possibility could be that individuals' internal control beliefs are disrupted by the experience of unemployment, and that

reemployment restores those initial control beliefs. Another explanation could be that gaining employment, be it after an episode of unemployment, after finishing one's education, or after a maternity or sick leave, always fosters an internal locus of control. In this later case, reemployment would thus increase internal control beliefs independent of individuals' previous experiences of unemployment. Future research could aim to disentangle those different explanations for the effect of reemployment on subsequent locus of control.

5.6 Conclusion

On the basis of the stress process model (Pearlin et al., 1981), the present study investigates the role of locus of control in explaining the processes following unemployment and reemployment. We find that unemployment and strains lead to decreases in internal locus of control beliefs, which in turn predict health-related outcomes. This process is reversed when individuals gain reemployment: Internal locus of control is restored and positively affects health. Our results thus offer an explanation for the beneficial effects of reemployment and support the notion that salient work-related experiences can shape personality change over time.

6 Conclusion

The aim of the present dissertation is twofold: On the one hand, it examines the selection effect of personality on vocational choices by investigating personality traits as predictors of career transitions. On the other hand, it tests the socialization effect of personality in occupational settings by exploring whether career transitions also have an impact on individuals' personality development. In sum, the results provide evidence for both a selection and a socialization effect of personality in the context of career transitions. Analyses exploring the selection effect reveal that risk propensity serves as a predictor of self-employment entry and survival (see Chapters 2 and 3), while openness to experience has an impact on upward job changes into managerial and professional positions (see Chapter 4). Results pertaining to the socialization effect furthermore show that career transitions also seem to have an effect on individuals' personality development: Self-employment entry increases individuals' subsequent willingness to take risks (see Chapter 3), upward job changes have an effect on levels of openness to experience (see Chapter 4), and unemployment and reemployment affect individuals' internal control beliefs (Chapter 5). Building on four different empirical studies, the present dissertation thus offers support for the existence of reciprocal influences between personality traits and career transitions.

6.1 Theoretical Implications

There are two main theoretical contributions that follow from the results obtained in this dissertation. First, I find empirical support for the notion that personality traits indeed affect actual vocational choices. Under the guiding framework of the dispositional approach, an array of studies has investigated personality as a predictor of work-related outcomes. Although those studies offer support for the notion that personality traits shape individuals' attitudes towards and behavior in their occupations, they provide only limited insights concerning the question of whether personality also plays a role in predicting actual career-

related choices. The results obtained in Chapters 2, 3, and 4 are supportive of the proposition that there is a selection effect of personality in vocational settings, which has been put forward in the theory of vocational choice (Holland, 1959), person-environment fit theory (Caplan, 1987; Sims, 1983), and the attraction-selection-attrition model (Schneider, 1987). Personality traits indeed seem to play a role in predicting drastic changes in people's professional lives, such as becoming and remaining self-employed or initiating job changes. The findings thus extend our previous knowledge concerning the role of personality in vocational settings: Personality traits do not only affect people's attitudes towards certain occupations or their behavior at work, they also play a role in determining which career choices people actually make in the first place.

Second, the findings obtained in the present dissertation challenge scholars' traditional view of personality at work. As outlined above, personality traits have commonly been investigated as predictors of work-related outcomes, an approach that is based on the assumption that personality is stable over one's lifespan. The results of Chapters 3, 4, and 5, however, offer support for a socialization effect of personality in an occupational context: Major work related experiences seem to have an effect on individuals' personality development. Those findings are in line with social investment theory (Roberts et al., 2005), which suggests that personality development can occur when individuals enter new social roles that are associated with certain behavioral expectations. For example, people tend to become more risk-seeking after they have become self-employed (see Chapter 3), potentially because the social role of being an entrepreneur is associated with that trait.

The findings obtained in Chapters 3 and 4 furthermore support the propositions of the corresponsive principle (Roberts et al., 2003), which suggests that the personality traits that predict certain work experiences are the same ones that change in response to those experiences. To illustrate this, recall that individuals' openness to experience did not only

predict upward job changes into managerial and professional positions, but was also amplified in response to those upward job changes. Certain career transitions thus seem to be events that are salient enough to have an effect on individuals' personality development. The finding that personality traits may not only be regarded as predictors, but also as outcomes of vocational events calls for a reconceptualization of personality in occupational settings.

6.2 Practical Implications

The practical implications that can be derived from the studies presented in Chapters 2 through 5 can be used for selection purposes on the one hand and interventions on the other hand. First, pertaining to selection purposes, Chapters 2 and 3 offer support for the notion that individuals with a high willingness to take risks may be especially prone to becoming self-employed. However, those individuals may not be the ones who are also most successful in the occupation. Therefore, if government organizations aim at promoting and sustaining self-employment, they may focus on supporting individuals with a moderate rather than a high risk propensity. Results of the study presented in Chapter 4 furthermore suggest that individuals who score highly on the personality trait openness to experience are especially likely to initiate upward job changes into managerial and professional positions. Organizations may use that insight for selecting purposes. For example, growing organizations or start-up businesses may need employees who are willing to take responsibility quickly in managerial positions. Such organizations may benefit from selecting individuals with a high openness to experience, since those individuals may be more likely to take on such positions. Individuals with lower levels of openness to experience, however, may be less likely to remain within organizations where they face such requirements.

Second, the findings obtained in this dissertation can be used for designing interventions in several different contexts. Results presented in Chapters 2 and 3 suggest that individuals with a moderate risk propensity may be more likely to succeed as entrepreneurs

than individuals with extremely high or low levels of risk propensity. Therefore, interventions fostering a moderate risk propensity among individuals who are interested in starting their own business may enhance the likelihood of venture survival. Also, the finding that self-employment entry may further enhance entrepreneurs' willingness to take risks obtained in Chapter 3 may be used for designing interventions. More particularly, one could aim at maintaining moderate levels of risk taking among entrepreneurs to avoid them developing a disadvantageous, overly strong willingness to take risks. The findings obtained in Chapter 4 offer further opportunities for developing interventions. Since employees with a high openness to experience are likely to pursue upward job changes, organizations may benefit from offering those employees suitable interventions, such as job with high levels of responsibility, for retaining them in the organization. Such interventions may foster employees' perceptions of future development opportunities which may lead them to pursue upward job changes internally rather than externally. Furthermore, Chapter 4 suggests that upward job changes may increase employees' openness to experience, so that certain interventions involving managerial tasks may help maintain and foster that trait. This may be a desirable outcome for organizations, since those openness to experience also predisposes employees for leadership positions (Judge et al., 2002). In addition, Chapter 5 suggests that the negative effect of job loss on health can be explained through decreases in internal control beliefs. The findings furthermore offer support for the notion that locus of control can potentially be modified by certain experiences. Therefore, intervention programs for the unemployed could focus on elevating individuals' internal control beliefs in order to weaken the negative health-related consequences of unemployment. Such interventions could be especially suitable for individuals who suffer from elevated strains, since they are especially likely to display a more external locus of control.

6.3 Limitations and Future Research

The present dissertation offers a novel view on the role of personality at work, but is not without its limitations, which, however, could be addressed in future research. First, there is room for improvement concerning the theoretical framework of the studies presented. While the effect of personality traits on subsequent vocational transitions is well-grounded in theory, far less is known about the reciprocal effect of work-related experiences on personality development. Particularly the processes and mechanisms underlying changes in individuals' personality traits in response to work-related events need further investigation. Social investment theory (Roberts et al., 2005) offers one potential explanation, advocating that individuals' investment in social roles is a driver of personality development. However, from the empirical results of this dissertation I can barely draw any conclusions concerning the mechanisms through which personality trait changes occur. Chapter 5 introduces increased strain as an explanatory variable for changes in internal control beliefs, but this finding cannot be applied easily to other contexts. Future research would thus benefit immensely from investigating further potential mechanisms responsible for changes in personality traits.

Another theoretical approach to reciprocal influences between personality traits and career transitions is the corresponsive principle (Roberts et al., 2003), which suggests that the personality traits that lead to certain work experiences are the same ones that change in response to those experiences. Chapter 3 and 4 offer support for this notion, showing that risk propensity leads to and follows from self-employment entry and that openness to experience is a predictor as well as an outcome of upward job changes into managerial and professional positions. However, if already distinct personality traits keep being enhanced by work experiences over time, ceiling effects should occur at some point. Therefore, future research could examine reciprocal influences between personality traits and work experiences with

more frequent data collections points. Such an approach could also help differentiate the effect of work experiences on personality changes from day-to-day changes in personality, which have been investigated recently (Judge, Simon, Hurst, & Kelley, 2014).

As a second limitation of the studies presented in Chapters 2 through 5, their methodological approaches need to be discussed. Although the analyses are based on large, longitudinal datasets which are representative of two countries, causal claims ultimately cannot be made. To estimate whether personality traits predict career transitions, I made use of survival analyses rather than logistic regression analyses, thus providing the arguably most suitable analytical strategy. For investigating the effect of career transitions on personality traits, I made use of propensity score matching to strengthen causal inference. Other scholars have relied on latent change models (McArdle, 1980) to pursue similar research questions. In any case, the data that those analyses are based on remain solely observational, and no methodological approach can replace an experimental research design. As Haviland and colleagues (2007) have pointed out, propensity score matching cannot control for covariates that were not measured, so that the approach cannot be regarded as a substitute for randomization in a randomized controlled trial. This point could be addressed by future research, which may aim at investigating personality trait changes as outcomes of work-related manipulations in experiments or field studies.

Third, and probably most importantly, emphasis needs to be placed on the practical relevance of personality change and particularly on its consequences. Although all studies included in this dissertation offer empirical support for the notion that career transitions can shape personality development, the effect sizes are small to moderate. Chapter 5, however, shows that personality trait changes can have relevant consequences, such as health-related problems. To investigate whether the personality development that occurs in response to

major career transitions is indeed meaningful, future research should identify further consequences of such personality trait changes.

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