



Facilitators and Outcomes of Career Preparation among
University Students and Graduates

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Abstract

To be prepared for one's own career is a major task during career development. However, existing research has primarily focused on adolescence in the transition from school to work while research on career preparation among university students, that are challenged by successfully transiting from university to work, are lacking so far. Thus, this cumulative dissertation studies career preparation in terms of career decidedness, planning, confidence, and career engagement using large samples of German university students and alumni as well as a variety of quantitative methods like latent state-trait analysis, cross-lagged analysis, and mediation analysis with multiple mediators.

In the first paper, the stable component of career indecision is investigated with longitudinal data stemming from two samples with different time lags (Sample 1: $N = 363$, 7 weeks; Sample 2: $N = 591$, 6 months). Furthermore, the combined and unique effects of career indecisiveness and generalized indecisiveness on life satisfaction are examined using a sample consisting of 469 university students. Results indicate that career indecision is determined by a stable component (i.e., trait career indecisiveness) that is associated with lower core self-evaluations, lower occupational self-efficacy, and higher perception of career barriers. Additionally, results indicate that the stable career indecision component explains 5% of the variance in student life satisfaction beyond self-evaluated generalized indecisiveness.

The second paper deals with the relationships of vocational interest characteristics—interest congruence, interest differentiation, and general interest level (elevation) - with several indicators of career preparedness (i.e., career planning, occupational self-efficacy beliefs, career decidedness, and career engagement) among a sample of 239 university students. Controlling for sociodemographic variables, multiple regression analyses revealed that differentiation is positively associated with career decidedness and career engagement and elevation is positively related to occupational self-efficacy beliefs and career engagement.

The third paper investigates how protean career orientation (PCO) is related to vocational identity clarity and occupational self-efficacy. Study 1 reports a 1-year, three-wave cross-lagged study among 563 university students and established that PCO preceded changes in identity and self-efficacy – but not the other way around. Based on a 6-month longitudinal study of 202 employees, Study 2 shows that identity clarity and self-efficacy mediated the effects of PCO on career satisfaction and proactive career behaviors. PCO only possessed incremental predictive validity regarding proactive career behaviors. However, specific direct or mediated effects of PCO on job satisfaction could not be confirmed.

The fourth paper explores the relationships between narcissism and two indicators of career success (i.e., salary and career satisfaction) among a group of young professionals ($N = 314$). A model proposing that the effect of narcissism on career success is mediated by increased occupational self-efficacy beliefs and career engagement was assessed. While correlations between narcissism and the two indicators of career success were minimal, the results show a significant indirect effect on salary via occupational self-efficacy and indirect effects on career satisfaction via self-efficacy and career engagement.

Overall, the different studies corroborate the crucial role of career preparation for a successful start into working life. In sum, this dissertation contributes to literature on vocational psychology by providing novel insights in terms of facilitators and outcomes of career preparation among university students and graduates. Theoretical and practical implications are discussed, and promising directions for future research are identified.

Zusammenfassung

Auf die berufliche Karriere vorbereiten zu sein, stellt eine der wichtigsten Aufgaben in der Karriereentwicklung dar. Die bisherige Forschung hat dies jedoch hauptsächlich an Jugendlichen im Übergang von der Schule in den Beruf untersucht. Forschungsergebnisse zur Karrierevorbereitung von Studierenden, die mit der Herausforderung des erfolgreichen Übergangs von der Universität in den Beruf konfrontiert sind, fehlen jedoch weitestgehend. Diese kumulative Dissertation untersucht die Karrierevorbereitung (d.h. Karriere-Entschiedenheit, Karriereplanung, Selbstvertrauen und Karriere-Engagement) an Universitätsstudierenden und –absolventen in Deutschland. Die Analysen wurden mit Hilfe von verschiedenen quantitativen Verfahren wie der Latent State-Trait Analyse, der Cross-Lagged Analyse und der Mediationsanalyse mit multiplen Mediatoren durchgeführt.

Im ersten Paper wird die zeitlich stabile Komponente von Karriere-Unentschiedenheit mit Längsschnittdaten zweier Stichproben mit unterschiedlichen Zeitabständen zwischen den Erhebungen (Stichprobe 1: $N = 363$, 7 Wochen; Stichprobe 2: $N = 591$, 6 Monate) untersucht. Außerdem werden kombinierte und einzigartige Effekte von Karriere-Unschlüssigkeit und allgemeiner Unschlüssigkeit auf die Lebenszufriedenheit in einer Stichprobe mit 469 Studierenden untersucht. Die Ergebnisse zeigen, dass die Karriere-Unentschiedenheit durch eine stabile Komponente (Trait Karriere-Unschlüssigkeit) determiniert ist, die mit niedriger zentraler Selbstbewertung, niedrigen beruflichen Selbstwirksamkeitserwartungen und höheren wahrgenommenen Karrierebarrieren assoziiert ist. Außerdem wird gezeigt, dass die Karriere-Unschlüssigkeit als zusätzlicher Prädiktor neben der allgemeinen Unschlüssigkeit den Anteil aufgeklärter Varianz in der Lebenszufriedenheit von Studierenden um 5% erhöht.

Im zweiten Paper wird der Zusammenhang zwischen den Sekundärkonstrukten beruflicher Interessen (Interessenkongruenz, Interessendifferenziertheit und allgemeines Interessenlevel) mit verschiedenen Indikatoren der Karrierevorbereitung (Karriereplanung, berufliche Selbstwirksamkeitserwartungen, Karriere-Entschiedenheit und Karriere-Engagement) an 239 Studierenden untersucht. Die Ergebnisse der multiplen Regressionsanalyse (kontrolliert für soziodemographische Variablen) zeigen, dass die Differenziertheit positiv mit der Karriere-Entschiedenheit und dem Karriere-Engagement zusammenhängt und dass das Interessenlevel positiv mit den beruflichen Selbstwirksamkeitserwartungen und dem Karriere-Engagement assoziiert ist.

Im dritten Paper wird untersucht, wie die proteische Laufbahnorientierung (PCO) mit der beruflichen Klarheit und den beruflichen Selbstwirksamkeitserwartungen verknüpft ist. Die erste Cross-lagged-Studie über einen Zeitraum von einem Jahr mit drei Messzeitpunkten ($N = 563$ Studierende) zeigt, dass die PCO den Änderungen in der beruflichen Klarheit und der Selbstwirksamkeitserwartungen vorangeht. In umgekehrter Richtung wird diese Beziehung nicht gefunden. Die zweite Studie über sechs Monate mit 202 Berufstätigen zeigt, dass die berufliche Klarheit und die Selbstwirksamkeitserwartungen Mediatoren bei den Effekten von PCO auf die Karrierezufriedenheit und das proaktive Karriereverhalten sind. Die PCO zeigt außerdem eine inkrementelle prädiktive Validität in Bezug auf proaktives Karriereverhalten. Keine direkten oder indirekten Effekte von PCO auf die Arbeitszufriedenheit konnten gefunden werden.

Im vierten Paper werden die Beziehungen von Narzissmus und zwei Indikatoren von Karriereerfolg (Gehalt und Karrierezufriedenheit) in einer Stichprobe von 314 jungen Berufstätigen untersucht. Die Ergebnisse zeigen, dass die beruflichen Selbstwirksamkeitserwartungen und das Karriere-Engagement als Mediatoren im Effekt von Narzissmus auf den Karriereerfolg agieren. Zwar sind die Korrelationen zwischen Narzissmus und dem Karriereerfolg klein, die Ergebnisse zeigen dennoch einen signifikanten indirekten Effekt auf das Gehalt über Selbstwirksamkeitserwartungen und einen indirekten Effekt auf die Karrierezufriedenheit über Selbstwirksamkeitserwartungen und Karriere-Engagement.

Insgesamt bekräftigen die verschiedenen Studien die zentrale Rolle der Karrierevorbereitung für den erfolgreichen Start in das Arbeitsleben junger Universitätsabsolventen. Die Dissertation trägt damit zur Literatur der Arbeits- und der Berufspsychologie bei, indem sie neue Einsichten in begünstigenden Faktoren und Folgen der Karrierevorbereitung von Studierenden und Absolventen aufweist. Theoretische und praktische Implikationen werden diskutiert und künftige Forschungsrichtungen werden aufgezeigt.

1 Introduction

Career preparation displays a crucial task in career development that requires well-conceived career decision-making, careful career planning and gaining confidence in one's own abilities in order to achieve career goals (Skorikov, 2007). As previous research on school-to-work transitions has shown, being prepared for the career plays a pivotal role for the psychological well-being (Skorikov, 2007). In a broader context, factors of career preparation (i.e., career decidedness, planning, and confidence) are associated with important outcomes such as life satisfaction (e.g., Creed, Prideaux, & Patton, 2005) and career success (e.g., Abele & Spurk, 2009; Rigotti, Schyns, & Mohr, 2008). Given the relevance of this topic, there is a rising body of research on career preparation. However, most of it focused on samples of adolescence in the school-to-work transition. Because time at university reflects a phase that is crucial to career development, there is a need for research exploring career preparation among young adults facing the challenge of the transition from university to work or postgraduate degrees. In addition, a more comprehensive search for facilitators and outcomes of career preparation is needed in order to apply a clearer theoretical rationale of career preparation and to provide implications that are useful for career development in a university setting.

Extending previous studies, the present dissertation examines factors of career preparations based on cross-sectional and longitudinal data from diverse samples of university students and university graduates to bring new insights into the role of career preparation during the early yet critical career development stage at university. Since Skorikov's (2007) conceptualization of career preparedness refers to attitudes like career decidedness, planning, and confidence only, the present dissertation extends this concept by a behavioral factor named career engagement that displays the exhibition of specific behaviors to enhance a person's career development (Hirschi, Freund, & Herrmann, 2014).

The present dissertation aims to (1) examine the development of attitudinal and behavioral factors of career preparation among university students and university graduates, (2) investigate their correlates and facilitators (e.g., occupational interest, indecisiveness, and protean career orientation); and (3) explores if factors of career preparation lead to important career and life outcomes in terms of career success and life quality.

The findings of the dissertation advance the field of vocational psychology by providing important new insights into the relevance of attitudinal and behavioral factors of career preparation (Skorikov, 2007) in the critical time of the transition from university to work for career development. Due to the comprehensive search for correlates and facilitators of career preparation the nomological net of career preparedness is extended. Finally, the current dissertation extends previous research by clarifying the predictive validity of career preparation factors regarding important outcomes such as career and life satisfaction.

1.1 Career preparation

Due to advances in technology and changes in organizational structures, the nature of careers has changed dramatically (Sullivan, 1999). As a consequence, workers must take control for their own career development (Savickas, 2002). In this context, career preparation is regarded as a major task during career development among adolescence and young adults (Stringer, Kerpelman, & Skorikov, 2011). To be prepared for one's own career requires career decisions, career planning, and career confidence (Skorikov, 2007). The framework of career preparation is based on the theory of career construction (Savickas, 2005) that highlights the significant role of career adaptability for successful career development. Career adaptability is defined as the readiness for coping with vocational development tasks and transitions and consists of four major tasks: Individuals have to (1) become concerned about their work future, (2) take control over their occupational activities, (3) develop a conception about how to make occupational choices, and (4) gain the confidence to perform according to the career

choices they have made (Savickas, 2002). To successfully master these tasks, competencies such as planning, decision making, exploring, and problem solving/confidence are necessary. While planning, decision making, and confidence display more focused efforts that indicate a degree of career commitment, exploration is characterized by uncertainty and is regarded as less focused dimension. These three commitment-focused dimensions of career adaptability are assumed to be measures of the same, underlying construct, named career preparation. High inter-correlations between these three factors provided strong support for the model of career preparation as a latent construct (Skorikov, 2007). The factors of career preparation are defined as the following: *Career decidedness* is regarded as a clear picture of one's own interests and professional preferences. In contrast, undecided people face problems in making a decision about which career paths to pursue (Creed, Fallon, & Hood, 2009). *Career planning* is a future-oriented attitude that contains active strategies in order to attain one's future work states and career goals. *Confidence* (i.e., self-efficacy; Bandura, 1986) has been described as self-evaluation of the belief in one's own abilities to achieve goals and to complete tasks in a specific domain. In this dissertation, I specifically focus on occupational self-efficacy, the degree to which an individual is confident about mastering challenges in the occupational domain. In addition to Skorikov's (2007) factors of career preparedness, I also include *career engagement* as an indicator of career preparedness. In contrast to attitudes such as career decidedness, planning, and confidence, career engagement displays actual behavior that is important in a person's career development (Hirschi et al., 2014). As a higher-order construct, career engagement is decomposed in several career behaviors such as self- and environment-exploration, positioning behavior, networking, and collecting information about job opportunities. Previous research has revealed its relevance in the transition from university to work (Hirschi, Lee, Porfeli, & Vondracek, 2013).

Given the conceptual framework of career preparation, previous research has confirmed that those factors are significant indicators in explaining various life and career

outcomes, including, for example, satisfaction with life (Creed et al., 2005), salary, position in the organization, and career and job satisfaction (Abele & Spurk, 2009; Rigotti et al., 2008) as well as more success in job search (Koen, Klehe, Van Vianen, Zikic, & Nauta, 2010).

Research on career preparation has also provided first evidence for that it plays a pivotal role for important outcomes such as life satisfaction and social integration (Skorikov, 2007) as well as adjustment in terms of emotional stability, social adaptation, and self-actualization (Stringer, Kerpelman, & Skorikov, 2012). However, these studies use samples of high school students in the transition from school to work and we currently know comparatively little about how career preparation is important for university students' career development.

Several reasons exist that explain why the time at university marks a phase that is important during career development. First, identity, values, goals, and life structures, which in turn affect career choices, develop and change during emerging adulthood (Arnett, 2000), a period of time that is characterized by students' undergraduate years. Second, during the time at university, students' career development is significantly affected by continually receiving new career information, for example, from workplace-based experiences (internships), in practically oriented classes or due to participation in seminars offered by career services. The career decisions they will make in that time will affect their future career opportunities. Third, university students are confronted with the challenges of the transition from university to work or postgraduate degrees. As stated by Lent (2013), preparedness is an essential factor for mastering work transitions. Finally, compared to adolescence in the transition from school to work, university students are progressed in their career development since they have already chosen a study major; they have higher education and usually intend to work in more complex jobs. Hence, their need for career preparedness might differ compared to adolescences.

In consideration of the crucial role time at university plays for the career development, only a few studies examined career preparation among university students (e.g., Hirschi &

Herrmann, 2013; Praskova, Creed, & Hood, 2013) and provide first evidence for the significant role of career preparation at this career stage. However, there is a need for a comprehensive examination of career preparation factors, its correlates, facilitators and outcomes among young adults with higher educational backgrounds in the university-to-work transition.

1.2 Aims of the dissertation

The specific aims of the dissertation are to (1) investigate how attitudinal and behavioral factors of career preparation in terms of career decidedness, planning, confidence, and career engagement develop and interact over time among university students and university graduates, (2) explore whether personal characteristics such as indecisiveness, narcissism, and core self-evaluations as well as career-related variables such as vocational interests and protean career orientation facilitate attitudinal and behavioral factors of career preparations, and (3) examine if factors of career preparation lead to important career and life outcomes in terms of career success and life quality (i.e. satisfaction with life).

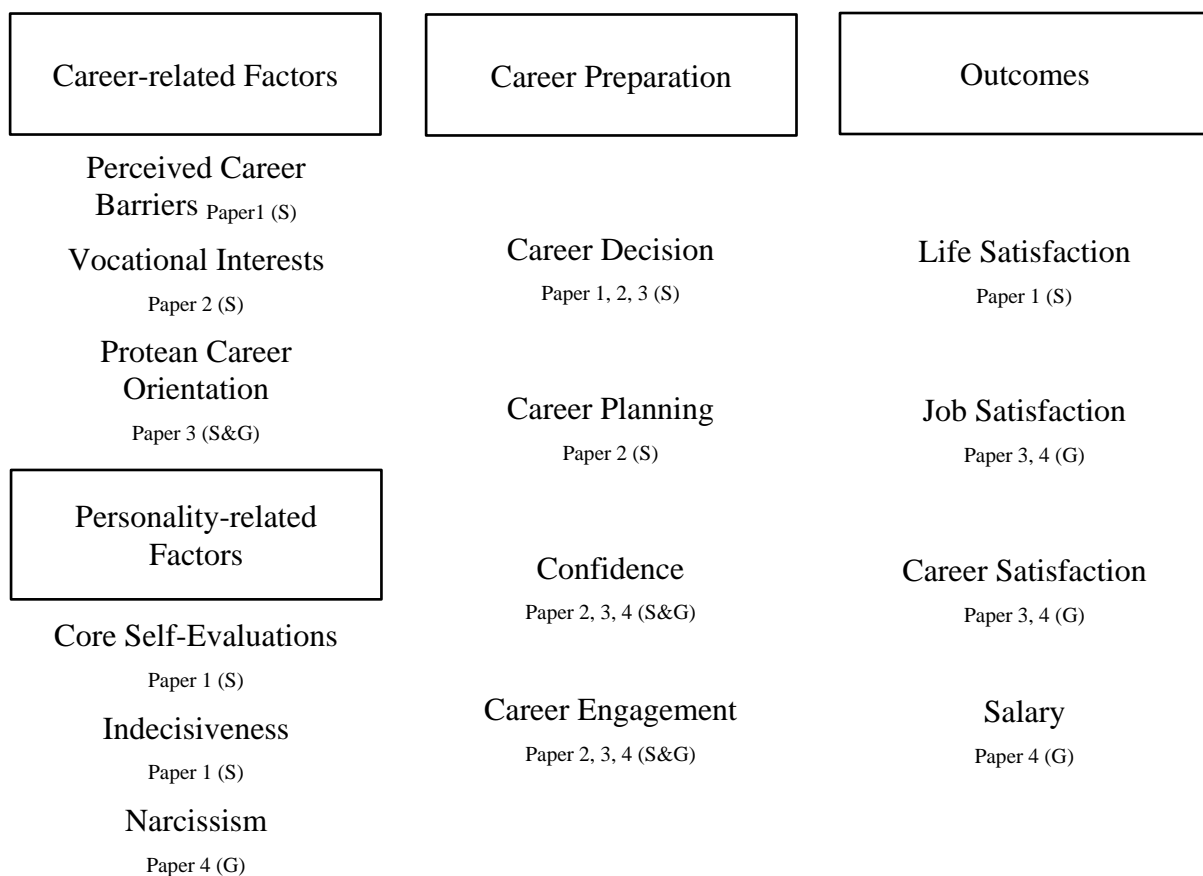
The dissertation contributes to existing research in several ways. First, the understanding of career preparedness is extended by providing new insights into the development of career preparation factors (i.e. career decidedness, planning, confidence and career engagement) among diverse samples of university students and graduates. Second, the nomological net of career preparedness is extended by exploring correlates and facilitators in terms of personal characteristics and career-related variables. Third, the dissertation clarifies the significance of career preparation factors by demonstrating their predictive validities regarding personal and career outcomes.

1.3 Outline of the dissertation

The present dissertation consists of four empirical papers investigating career preparation among university students and young professionals (Chapters 2 to 5). Each chapter represents a separate research paper based on a distinct data set.

In the first paper (Persistent Career Indecision over Time: Links with Personality, Barriers, Self-efficacy, and Life Satisfaction; Chapter 2), my co-authors and I investigate the stable component of career indecision (i.e., trait career indecisiveness) by means of latent state-trait analysis with longitudinal data stemming from two samples with different time lags (Sample 1: $N = 363$, 7 weeks; Sample 2: $N = 591$, 6 months). Furthermore, we examine the combined and unique effects of career indecisiveness and generalized indecisiveness on life satisfaction among university students ($N = 469$).

Figure 1: *Overview of the dissertation*



S Studied in a university student sample
 G Studied in a university graduates sample

In the second paper (The Relationships of Vocational Interest Congruence, Differentiation, and Elevation to Career Preparedness among University Students; Chapter 3), we investigate relationships of Holland's (1997) secondary constructs of vocational interests (i.e. interest congruence, interest differentiation, and interest elevation) with all dimensions of career preparation (i.e., career planning, occupational self-efficacy beliefs, career decidedness, and career engagement). Cross-sectional data from 239 university students were used to test the theoretical propositions.

In the third paper (Protean Career Orientation, Vocational Identity and Self-Efficacy: An Empirical Clarification of their Relationship; Chapter 4), my co-authors and I examine temporal precedence that links protean career orientation (PCO) and two factors of career preparation (i.e., vocational identity clarity and occupational self-efficacy) in a cross-lagged design. Additionally, we address the question whether vocational identity clarity and occupational self-efficacy mediate the effects of PCO on career outcomes such as engagement in proactive career behaviors, job satisfaction, and career satisfaction. Furthermore, we investigate to what extent PCO has incremental effects on these career outcomes beyond vocational identity clarity and occupational self-efficacy. Longitudinal data from 563 university students and 202 employees were used to investigate the research questions.

The fourth paper (Narcissism and Career Success: Occupational Self-Efficacy and Career Engagement as Mediators; Chapter 5) deals with the relationships between narcissism and two indicators of career success (i.e., salary and career satisfaction) among a group of university graduates ($N = 314$). Especially, we test a model in which the effects of narcissism on career success are mediated by two factors of career preparation (i.e. occupational self-efficacy beliefs and engagement in proactive career behaviors).

Finally, in Chapter 6, the key results are summarized and discussed. In particular, I reflect the strengths and limitations of the dissertation and highlight the relevance of the

results for theory and practice. Furthermore, I suggest future directions for research on career preparation.

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2 Persistent Career Indecision over Time: Links with Personality, Barriers, Self-efficacy, and Life Satisfaction

Abstract

Taking control over one's career requires the ability to make career decisions; thus, remaining in a state of career indecision is problematic. However, the stability of career indecision has not yet been investigated using advanced statistical modeling approaches. We present two studies of German university students applying three-wave, longitudinal designs. Study 1 investigated the stability of career indecision by means of latent state-trait analysis within two samples with different time lags (Sample 1: $N = 363$, 7 weeks; Sample 2: $N = 591$, 6 months). The results indicated that career indecision was determined by a stable component (i.e., trait career indecisiveness) that was associated with lower core self-evaluations, lower occupational self-efficacy, and higher perceived career barriers. Study 2 ($N = 469$) examined career indecision over one year. We found that the stable career indecision component explained 5% of the variance in student life satisfaction beyond self-evaluated generalized indecisiveness.

Keywords: career indecision, career indecisiveness, latent state-trait analysis

2.1 Introduction

People must make occupational decisions over their entire lifespan (Hartung, Porfeli, & Vondracek, 2005). Empirical research suggests that occupational decisions are among the most powerful factors that influence people's lives (Hackett & Betz, 1995). At a minimum, being undecided can hinder people from taking control of their careers (Savickas, 2013). Consequently, career indecision is among the most researched issues in vocational psychology (e.g., Gati, Krausz, & Osipow, 1996), and exploring its persistence and stability over time are crucial issues in this field of research. Compared to career indecision, *indecisiveness* is considered a chronic and stable trait variable, which manifests not only in the process of occupational decision-making but also in other life domains (Osipow, 1999). However, the stable component of career indecision (i.e., career indecisiveness) has hitherto not been investigated with an appropriate research design and methodology. To date, studies investigating the persistence of career indecision over time are rare, and studies assessing indecisiveness have usually employed questionnaires asking participants to directly indicate their indecisiveness. Extending these studies, the present paper uses latent state-trait analysis (LST; Steyer, Schmitt, & Eid, 1999) based on longitudinal data from three samples and different time lags to empirically derive the situation-specific and stable components of career indecision during the early yet critical career development stage at university. We also seek to clarify the links among the stable component of career indecision, personality and career variables as well as psychological well-being (i.e., satisfaction with life). The specific aims of the present paper are to (1) empirically assess the stable component of career indecision, (2) explore how the stable component of career indecision is associated with personality (i.e., core self-evaluations) and career-related variables (i.e., occupational self-efficacy, perceived career barriers), (3) investigate how the stable component of career indecision is related to life satisfaction, and (4) evaluate the combined and unique effects of the stable component of career indecision and generalized indecisiveness on life satisfaction. Our study contributes to

the existing research in several ways. First, we extend the understanding of career indecisiveness by providing new insights into the persistence and stability of career indecision over time. Second, we extend the nomological net of empirically assessed career indecisiveness by exploring correlates to personality characteristics as well as career-related variables. Third, the study clarifies the significance of empirically assessed career indecisiveness by demonstrating its predictive validity in comparison to generalized indecisiveness (assessed at a single measurement point) regarding life satisfaction.

2.1.1 Career Indecision and Indecisiveness

Over the recent decades, a growing number of researchers have investigated career indecision and indecisiveness as well as the distinction between the two (e.g., Santos, Ferreira, & Gonçalves, 2014). *Career indecision* is understood as problems making career-related decisions (Gati et al., 1996) and is regarded as a part of normal vocational development during the process of making these decisions, such as when faced with career transitions from university to work. Among undecided individuals, most are able to resolve this decision problem alone or with the support of career counselors (e.g., Betz & Serling, 1993). Therefore, career indecision is quite transient and typically caused by interpersonal conflicts, barriers, and/or lack of information (Brown & Lent, 2008). *Indecisiveness*, in contrast, is chronic and trait-like and, thus, a more pervasive problem with making decisions across life domains (Osipow, 1999). Research has established that indecisiveness is positively correlated with but distinct from career indecision (Di Fabio, Palazzeschi, Asulin-Peretz, & Gati, 2013; Santos et al., 2014). Additionally, a large body of evidence has provided support for the assumption that indecisiveness leads to many deficits in the decision-making process. Research has shown that indecisive individuals need more time to make decisions (Frost & Shows, 1993), are more likely to postpone decisions (Rassin & Muris, 2005), need more information before making decisions, report lower decision-making self-efficacy (Rassin, Muris, Franken, Smit, & Wong, 2007), and perceive more post-decisional problems (Germeijs

& Verschueren, 2011). Additionally, these individuals have more problems choosing college majors and career paths (Gayton, Clavin, Clavin, & Broida, 1994; Germeijs, Verschueren, & Soenens, 2006). Moreover, indecisiveness is closely related to personality variables, such as low self-esteem (Germeijs & De Boeck, 2002), trait anxiety (Germeijs & Verschueren, 2011), and external locus of control (Santos, 2001). In sum, indecisiveness is regarded as a risk factor for failing the task of career decision-making (Germeijs et al., 2006).

2.1.2 Measurement and Temporal Stability of Indecisiveness

Indecisiveness is usually assessed with direct self-reports. For example, the Indecisiveness Scale (IS) developed by Frost and Shows (1993) and the Measurement Scale for Indecisiveness developed by Germeijs and De Boeck (2002) aim to assess the level of indecisiveness by means of direct questions about chronic decision-making problems. For example: *“It seems that deciding on the most trivial thing takes me a long time”* (Frost & Shows, 1993, p. 685). Other researchers used subscales of career indecision measures to assess indecisiveness, sometimes labeled trait indecision (Nauta, 2012) or diffusion (Vondracek, Hostetler, Schulenberg, & Shimizu, 1990).

A few longitudinal studies have attempted to investigate the stability of self-evaluated indecisiveness over time. Germeijs et al. (2006) found that correlations between measurements of indecisiveness were high across three measurement points during grade 12. Similar results were provided by showing high retest reliability of indecisiveness ($r = .88$) over a 1-month interval (Rassin et al., 2007). Gati, Asulin-Peretz, and Fisher (2012) found high positive correlations between measurements of indecisiveness over 3 years and thereby also supported the notion that indecisiveness is trait-like. The stability of four factors of career indecision, including a trait indecision factor, were investigated by Nauta (2012); the eight-month retest coefficient of the trait indecision factor was quite stable with $r_{tt} = .76$ ($p < .01$). Vondracek, Hostetler, Schulenberg, and Shimizu (1990) found that diffusion as a subscale of career indecision was relatively stable over 3 years among a group of high school students.

As is evident from this review, only a few studies have investigated the temporal stability of indecisiveness. Moreover, stability estimates of self-evaluated indecisiveness have invariably been based on correlation coefficients over time and retest reliability coefficients. These methods have some notable limitations because they do not consider that persons provide questionnaire responses in specific contexts or situations that may vary considerably over time. Consequently, an indecisiveness score obtained at a given point in time is always influenced by the characteristics of the person and the situation. Thus, individual differences in direct measures of career indecisiveness are due not only to presumed underlying trait differences but also to situation effects (Steyer et al., 1999). Moreover, psychological measures are never perfectly reliable, which means that obtained scores are also influenced by measurement error. Additionally, the extant studies of the stability of indecisiveness employed measures that asked participants to self-evaluate their chronic indecisiveness instead of empirically evaluating the persistence of decision-making difficulties over time. To account for these limitations and advance our understanding of persistent career indecision (i.e., career indecisiveness), in this paper, we assessed career indecisiveness by means of indirect indicators (i.e., career indecision over time) and a LST analysis, which is a theoretically more appropriate statistical tool. LST allows for the identification of situation-specific fluctuations around an invariant trait as well as of a person-specific, stable trait-component (Geiser et al., 2014). By assessing this stable component of indecision over time, we are able to identify career indecisiveness that is free from situation effects and measurement error. Therefore, the first aim was to empirically evaluate the stable component of career indecision as an indicator of career indecisiveness. Thus, we addressed the following research question.

Research question 1: To what extent is career indecision comprised of a stable component (i.e., career indecisiveness) and a situation-specific component?

2.1.3 The Nomological Net of Career Indecisiveness

The second aim was to explore the nomological net of empirically assessed career indecisiveness by providing new insights into the relationships of career indecisiveness with personality characteristics (i.e., core self-evaluations) and career-related variables (perceived occupational barriers and occupational self-efficacy).

Core self-evaluations (CSE) are defined as an appraisal of an individual's worthiness and effectiveness. It is the common core of self-esteem, generalized self-efficacy, locus of control, and neuroticism (Judge, Erez, Bono, & Thoresen, 2003). Previous research has provided the first evidence that CSE seem to be important in the career decision-making process (Di Fabio, Palazzeschi, & Bar-On, 2012). CSE are also reflected in the meta-analytically derived four-factor model assessing the sources of career indecision by Brown and Rector (2008). Individuals with higher levels of self-esteem, self-efficacy, and emotional stability and who believe that they can control their life may be more confident in making occupational decisions and consequently show lower indecisiveness. Empirical findings have confirmed a negative relationship between CSE and career indecision (Di Fabio & Palazzeschi, 2012). In line with this result, we hypothesize the following.

Hypothesis 1: The stable component of career indecision (i.e., career indecisiveness) is negatively related to core self-evaluations.

Next, we included *perceived occupational barriers* in our study because we wanted to take into account environmental factors that are relevant in career development. As stated by Brown and Lent (1996) in their social cognitive career theory, perceived career-related barriers can hinder a person from entering a chosen career even when the person has well-developed interests in that career path. Therefore, the perception of high career barriers may lead to the inability to make a decision concerning one's career. In line with this assumption, the meta-analysis by Brown and Rector (2008) identified barriers as a major source of career

indecision. Additionally, Di Fabio et al. (2013) found a positive association between indecision and perceived barriers. Therefore, we hypothesized the following.

Hypothesis 2: The stable component of career indecision (i.e., career indecisiveness) is positively related to perceived career barriers.

Finally, *occupational self-efficacy* was addressed in this study. Self-efficacy is regarded as a self-evaluation that leads to a belief in one's own abilities to complete tasks or attain a defined level of achievement. In Brown and Rector's meta-analysis (2008), a major factor contributing to career decision-making difficulties reflects a lack of readiness, including a lack of confidence. For example, research showed that career decision self-efficacy acts as a significant predictor of career indecision (e.g., Betz & Klein Voyten, 1997). Thus, we assume that the belief in one's ability to fulfill requirements of a profession (i.e., occupational self-efficacy) may increase readiness and willingness to make a career decision. Conversely, individuals who do not trust their skills may not handle career choices well because this may lead individuals to avoid dealing with decision tasks and therefore remain undecided longer. We thus propose the following hypothesis.

Hypothesis 3: The stable component of career indecision (i.e., career indecisiveness) is negatively related to occupational self-efficacy.

2.1.4 Indecisiveness and Satisfaction with Life

The third aim was to explore how the stable component of career indecision is related to satisfaction with life. Empirical research has provided evidence of a negative relationship between self-evaluated indecisiveness and academic major satisfaction (Nauta, 2007) and career choice satisfaction (Gati et al., 2012). Indecisiveness implies a lack of clarity concerning how personal needs can be satisfied or personal goals can be attained. This lack of purpose and direction can be expected to negatively affect one's overall evolution of life satisfaction. Therefore, we proposed the following hypothesis.

Hypothesis 4: The stable component of career indecision (i.e., career indecisiveness) is negatively related to satisfaction with life.

In addition to assessing the link between empirically derived career indecisiveness and life satisfaction, we also aimed to compare the relationships of career indecisiveness and generalized indecisiveness with life satisfaction. Because indecisiveness is regarded as a pervasive problem with making decisions across life domains (Osipow, 1999), we assumed that career indecisiveness is positively related to, but empirically distinct from, generalized indecisiveness.

Hypothesis 5: The stable component of career indecision (i.e., career indecisiveness) is moderately positively related to self-evaluated generalized indecisiveness.

To evaluate the combined and unique predictive validity of career indecisiveness and generalized indecisiveness, we investigated the relationships of empirically assessed career indecisiveness and directly measured generalized indecisiveness with student life satisfaction. We hence addressed the following research question.

Research question 2: What are the combined and unique effects of career indecisiveness and generalized indecisiveness on student life satisfaction?

2.1.5 Overview of Studies

To investigate our research questions and hypotheses, we conducted two three-wave, longitudinal studies with three independent samples of university students. We surveyed university students because they are confronted with the task of preparing for the university to work transition for which engaging in career preparation and decision-making are important. Moreover, during university, students continually gain career information (e.g., from internships, in class, or as a result of career exploration), which can have a significant effect on their career decision-making. Thus, exploring stable and situation specific components of career indecision seems highly pertinent. Study 1 was concerned with assessing the stable component of career indecision and exploring how career indecisiveness is associated with

personality (i.e., CSE) and career-related variables (i.e., occupational self-efficacy, perceived career barriers), addressing Research Question 1 and Hypotheses (H) 1 to 3. Study 1 evaluated data collected from two independent samples, which were each assessed across three measurement points. Study 2 aimed to replicate the findings of Study 1 regarding the stable component of career indecision using a new sample and to extend Study 1 by investigating how the stable component of career indecision is related to life satisfaction and self-evaluated generalized indecisiveness, examining H4 and H5. Additionally, Study 2 was concerned with evaluating the combined and unique effects of career indecisiveness and generalized indecisiveness on student life satisfaction, addressing Research Question 2.

2.2 Study 1: Investigating the Stable Component of Career Indecision and its Correlates

2.2.1 Method

Participants and procedure. We surveyed two unique samples of university students enrolled in a mid-sized university in Germany. The same research question and hypotheses were investigated across samples but with different time intervals between the three measurement points (Sample 1: time lags = 7 weeks; Sample 2: time lags = 6 months) in order to provide insights into the generalizability of our results. *Sample 1* consisted of university students enrolled in the first semester of a master's degree in education. We chose a period of 14 weeks (including three measurement waves, each 7 weeks apart) because it covers the duration of one semester. During this semester, our participants spent regular periods working as student teachers at schools, which allowed them to collect valuable information about their future work tasks and environment and is likely to affect their career decision status. They were informed about the survey during a lecture and were then contacted directly by email ($N = 841$); the response rate was 65%. Participating students were contacted two more times during the semester, each seven weeks apart, which had response rates of 60% and 49%. For the final sample, we retained $n = 363$ participants who participated at T1 and provided at least

at one additional measurement, with 228 students participating in both follow-ups. The sample was 87% female, with an average age of 25.25 years ($SD = 4.60$).

In *Sample 2*, we invited students from across a variety of study fields to participate in our online survey. Overall, the sampled university offers over 30 different degree programs. The data collection points spanned one year (with three waves each six months apart) and were expected to cover enough time for changes to occur in participant career development and decision-making status. The sample was obtained by contacting students enrolled in the second or third year of their studies by email ($N = 3,800$); the response rate was 30% ($n = 1,148$). Participating students were contacted again two times, each six months apart, resulting in response rates of 37% and 34%. The final sample, $n = 591$, participated at T1 and provided at least at one additional measurement point, with 225 participating in both follow-ups. This sample was 65% female, with an average age of 23.64 years ($SD = 2.73$) and a mean number of enrolled semesters of 3.73 ($SD = 2.14$). Participants represented a wide range of fields of which the most common were management and entrepreneurship (19%), business psychology (16%), and business administration (14%).

For both samples, a three-wave longitudinal panel design that collected data on career indecision at three measurement points (T1 – T3) was utilized. CSE, perceived career barriers, and occupational self-efficacy were assessed during the first measurement point (T1) in both samples. We evaluated whether students who participated only at T1 differed significantly in the measures assessed at T1 from those who participated in at least one additional wave. For both samples, we compared groups using t-tests and Bonferroni corrections. The results suggested that the study dropouts did not differ from those who stayed in the study on career indecision, CSE, or occupational self-efficacy. However, dropouts in Samples 1 and 2 were more likely to be male, and in Sample 2, they reported more career barriers and older age. Therefore, some retention bias should be considered for this sample when interpreting the results.

Measures. Table 1 presents the mean scores, standard deviations, and Cronbach's alpha reliability estimates as well as the bivariate correlations of the study variables for both samples on a latent level.

Career indecision. The German version of the 'My Vocational Identity Scale' (Holland, Daiger, & Power, 1980; Jörin, Stoll, Bergmann, & Eder, 2004) was applied with seven items ("*I still need to figure out which professional direction I should pursue*"; "*If I had to decide for an occupation right now, I would be afraid to make the wrong decision*"; "*I am not yet sure, which occupations I could perform successfully*"; "*I am not sure if my current choice (education/job/profession) is in fact the right one for me*"; "*I do not yet exactly know which life goals I want to realize*"; "*I do not yet exactly know, which job would be fun doing in the long run*"; "*I am unclear about my own strengths, weaknesses, interests, and abilities*") and a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale is an adoption to German with a reduced number of items compared with the original English version (Jörin et al., 2004). For the German language scale, good reliability of $\alpha = .88$ - $.89$ was found, and construct validity was supported by significant correlations with, for example, career planning among university students (Hirschi & Herrmann, 2013). Although the scale label indicates a measure of identity, its content is basically identical to measures of career indecision. In support of this, Hirschi and Läge (2007) reported a correlation between a career decidedness measure and Holland et al.'s (1980) vocational identity scale (negatively scored) of about $r = .80$.

Core self-evaluations. The German version of the CSE Scale (Judge et al., 2003) was applied, translated and validated by Stumpp, Muck, Hülshager, Judge, and Maier (2010). The scale contains 12 items (e.g., "*I am confident that I get the success I deserve in life*") measured on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items stem from four domains: self-esteem, generalized self-efficacy, locus of control, and neuroticism. Stumpp et al. (2010) reported a scale reliability between $\alpha = .81$ and $\alpha = .86$.

Table 1: Study 1 - Summary of Latent Intercorrelations, Means, and Standard Deviations among the Assessed Constructs

		1	2	3	4	5	6	7	<i>N</i>	<i>M</i>	<i>SD</i>
1 Career Indecision	T1	(.88/.88)	.78***	.78***	-.50***	.27***	-.47***	-	590	17.94	6.14
2 Career Indecision	T2	.91***	(.91/.88)	.83***	-.39***	.23***	-.43***	-	423	17.96	6.23
3 Career Indecision	T3	.83***	.89***	(.92/.88)	-.40***	.23***	-.43***	-	392	18.24	6.32
4 Core Self-Evaluations	T1	-.46***	-.50***	-.49***	(.85/.86)	-.51***	.74***	-.53***	587	45.15	7.05
5 Perceived Career Barriers	T1	.19*	.17**	.25***	-.47***	(.67/.73)	-.29***	.31***	586	12.03	3.99
6 Occupational Self-Efficacy	T1	-.50***	-.45***	-.40***	-.66***	-.16	(.81/.80)	-.50***	588	25.57	4.00
7 Trait Career Indecisiveness		-	-	-	-.51***	.20**	-.48***	-	-	-	-
<i>N</i>		363	325	266	363	363	363				
<i>M</i>		13.36	12.98	13.30	45.59	12.00	25.82				
<i>SD</i>		5.34	5.53	5.92	6.71	3.66	3.76				

Note. Below diagonal: Sample 1 (time-lags = 7 weeks): *N* = 363; above diagonal Sample 2 (time-lags = 6 months): *N* = 591; entries in parentheses in diagonal are the Cronbach's alpha reliability coefficients (left: Sample 1/right: Sample 2).

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

The criterion-related validity of the original scale is confirmed by results displaying a significant relationship with job satisfaction (Bono & Judge, 2003). The German version also showed adequate factorial structure and positive relationships with objective and subjective career success (Stumpp et al., 2010).

Perceived career barriers. Career barriers were measured using the six-item scale by Hirschi and Freund (2014). Students were asked to indicate to what extent six different factors (e.g., external circumstances and family responsibilities) were perceived as barriers to their career development using a five-point scale ranging from 1 (*not at all*) to 5 (*very much*). Hirschi and Freund (2014) established construct validity by showing significant relationships among perceived career barriers, career decidedness and career planning. Their results also reveal a good internal consistency measure of $\alpha = .77$.

Occupational self-efficacy. Occupational self-efficacy was assessed using the German version of the short occupational self-efficacy scale by Rigotti, Schyns, and Mohr (2008). The scale consists of six items (e.g., “*I feel prepared for most of the demands in my job*”), and answers were provided on a six-point scale ranging from 1 (*not at all true*) to 6 (*completely true*). Rigotti et al. (2008) showed a good reliability measure of $\alpha = .87$ for the German sample and also found evidence of construct validity by documenting significant relationships with job satisfaction and performance as well as organizational commitment among German employees.

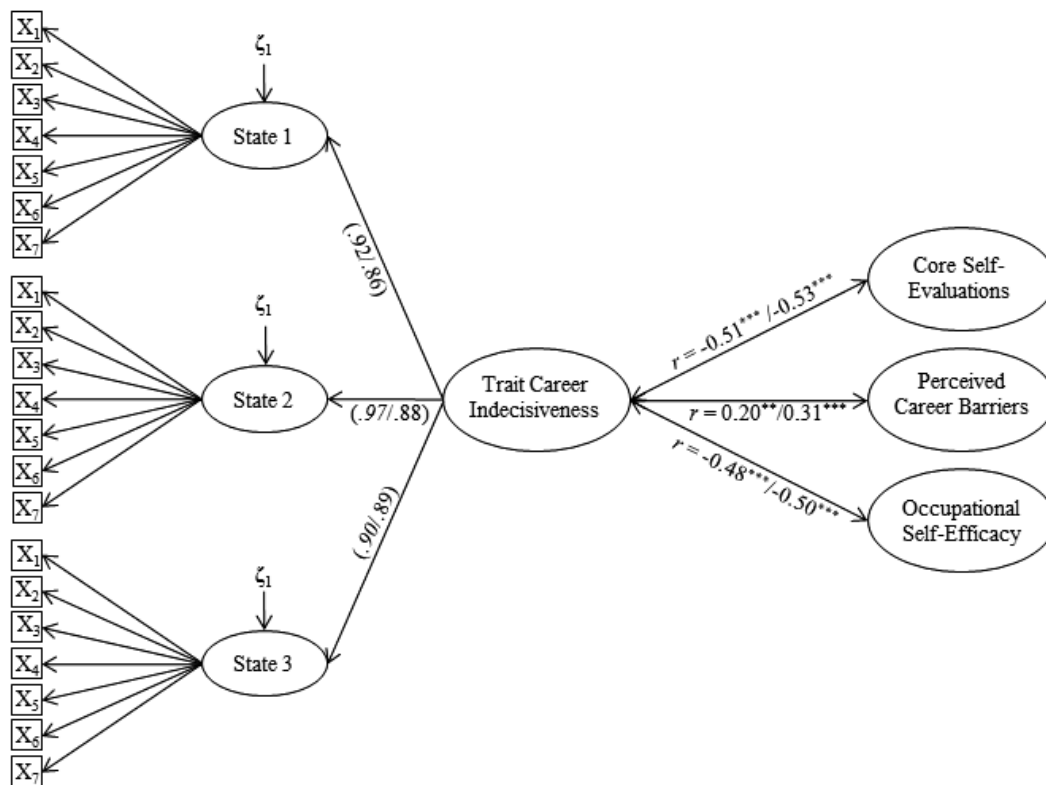
2.2.2 Results and Discussion

Analytical approach. To assess the stable component of career indecision (i.e., career indecisiveness) over time, we used LST analyses. LST theory is based on the assumption that individuals' behavior is determined systematically both by their characteristics (i.e., the person's trait) and by the characteristics of the situation (i.e., the situation-specific state). Moreover, the interaction between person and situation plays an important role (Steyer et al., 1999). For a given person, the trait component remains relatively stable, while the state

naturally varies over time and situations. Figures 2 and 3 depict the LST models for career indecision. To illustrate the analysis, note that the observed variables (the seven career indecision items) at each measurement occasion can be decomposed in two stages: first, into a latent state and a situation-specific observed residual ε_{ik} and second, the latent states (representing situational and/or interaction effects) can be decomposed into a component that is influenced by the person (representing the stable trait component) and a situation-specific latent residual ζ_k . In statistical terms, the total variance is decomposed into trait variance, state variance, and measurement error variance. First, trait variance captures the stability in individual career indecision over the assessed period. Second, state variance reveals systematic changes in individual career indecision over the given period. Third, the remaining variance component, measurement error, takes into account that psychological states and traits are assessed with imperfectly reliable measures. Such measure unreliability is due to random error variance, which ought not systematically bias the results but should not be ignored (Schmidt & Hunter, 1996). In Table 2, for each item of career indecision, we report (a) the *consistency coefficient* that displays the amount of explained variance explained by interindividual differences due to the latent trait, (b) the *specificity coefficient* that reflects that proportion of variance explained by situation and/or person-situation effects, and (c) the *reliability coefficient* as the amount of variance explained by the latent trait and latent state residual (Steyer et al., 1999). To assess our measurement models, we used Mplus 6.11 software (Muthen & Muthen, 2010) and maximum likelihood estimation that is robust to non-normality of the sampling distribution (MLR). To evaluate and compare model fits, we used two fit indices: the comparative fit index (CFI) and the root-mean-square error of approximation (RMSEA). CFI values of .95 and above are considered acceptable, while RMSEA values close to .06 or less indicate acceptable model fit (Hu & Bentler, 1999). Additionally, we applied the Satorra-Bentler corrected (SB) χ^2 test as a significance test, which is useful when the assumption of normally distributed data is rejected. This index

indicates how the model fits the sample data; a significant test result ($p < .05$) indicates that the data differs significantly from the proposed model.

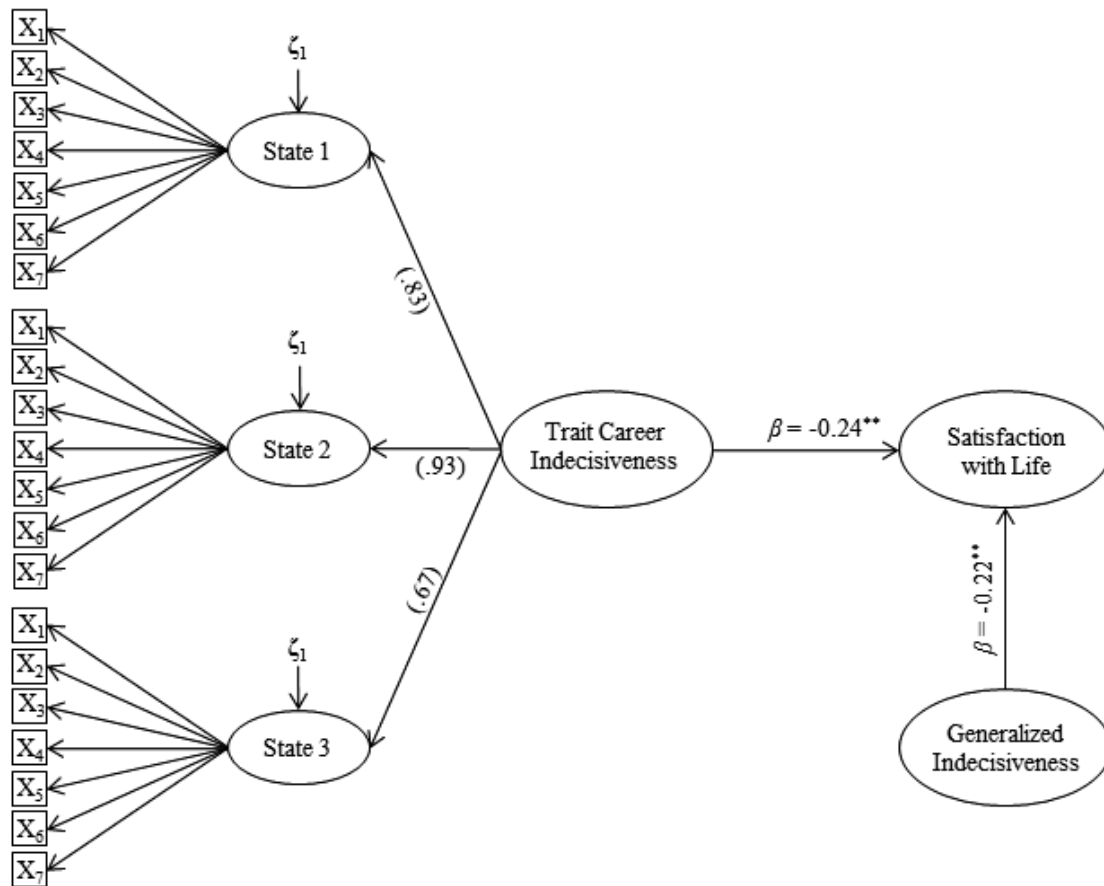
Figure 2: Study 1 - Latent State-Trait Model of Career Indecision and Latent Correlations to CSE, Perceived Career Barriers, and Occupational Self-Efficacy



Sample 1: $\chi^2(915) = 1535.087, p = .000; CFI = .92; RMSEA = .04$; Sample 2: $\chi^2(915) = 1833.832, p = .000; CFI = .90; RMSEA = .04$

Notes: left: Sample 1; time-lags = 7 weeks; $N = 363$ /right: Sample 2; time-lags = 6 months; $N = 561$. For reasons of clarity, item residual variables ε for career indecision variables are not shown in the figure. ζ_1 to ζ_3 = Latent state residuals of career indecision for the three measurement points indicating the variability due to the situation and the person \times situation interaction. Entries in parentheses are the standardized factor loadings. X₁ to X₇ indicate the items of the career indecision scale.

Figure 3: Study 2 - Latent State-Trait Model of Career Indecision and Latent Regression Model Explaining Satisfaction with Life (N = 469)



$\chi^2(602) = 1139.374, p = .000; CFI = .91; RMSEA = .05$

Notes: For reasons of clarity, item residual variables ε for career indecision variables are not shown in the figure. ζ_1 to ζ_3 = Latent state residuals of career indecision for the three measurement points indicating the variability due to the situation and the person \times situation interaction. Entries in parentheses are the standardized factor loading.

Table 2: *Study 1 and Study 2 - Consistency (CON), Specificity (SPE), and Reliability (REL) Coefficients*

		Study 1: Sample 1			Study 1: Sample 2			Study 2		
		CON	SPE	REL	CON	SPE	REL	CON	SPE	REL
State 1	Item 1	.53	.10	.63	.43	.20	.64	.43	.18	.62
	Item 2	.62	.12	.74	.46	.22	.68	.46	.19	.65
	Item 3	.57	.11	.68	.43	.20	.63	.45	.19	.63
	Item 4	.44	.09	.53	.36	.17	.53	.35	.15	.50
	Item 5	.36	.07	.44	.37	.17	.54	.41	.17	.58
	Item 6	.53	.10	.63	.43	.20	.63	.46	.20	.66
	Item 7	.40	.08	.48	.41	.19	.60	.41	.17	.58
State 2	Item 1	.59	.03	.62	.47	.13	.60	.51	.10	.62
	Item 2	.66	.04	.70	.49	.14	.63	.53	.11	.64
	Item 3	.60	.03	.63	.51	.14	.65	.56	.11	.68
	Item 4	.58	.03	.61	.38	.10	.48	.40	.08	.48
	Item 5	.45	.02	.48	.41	.11	.52	.43	.09	.52
	Item 6	.59	.03	.62	.47	.13	.60	.49	.10	.59
	Item 7	.46	.02	.48	.43	.12	.55	.50	.10	.60
State 3	Item 1	.58	.16	.74	.45	.13	.59	.36	.37	.73
	Item 2	.54	.15	.69	.49	.14	.63	.38	.40	.78
	Item 3	.53	.15	.68	.51	.15	.66	.37	.39	.77
	Item 4	.43	.12	.55	.38	.11	.50	.30	.31	.61
	Item 5	.41	.12	.53	.39	.11	.50	.30	.31	.61
	Item 6	.57	.16	.73	.48	.14	.62	.37	.38	.75
	Item 7	.43	.12	.55	.42	.12	.54	.33	.34	.67

Preliminary analyses. First, we assessed the distinctness of the applied measures and evaluated the quality of the measurement model. We conducted a series of confirmatory factor analyses (CFA) among students who participated at T1 in Samples 1 and 2 and compared the model fit of a single-factor model, several two-factor models (pairing two of the scales versus the third and fourth scale, e.g., career indecision and CSE as one factor and perceived career barriers and occupational self-efficacy as the second factor) and the proposed four-factor model distinguishing career indecision from CSE, perceived career barriers, and occupational self-efficacy. Model comparisons were based on the χ^2 difference test with Satorra-Bentler corrections (Satorra & Bentler, 2001). Overall, the four-factor model provided significantly better fit than the other models (Sample 1: $SB-\chi^2 = 824.44$, $df = 428$, $p < .001$; $CFI = .89$; $RMSEA = .05$; Sample 2: $SB-\chi^2 = 1169.72$, $df = 428$, $p < .001$; $CFI = .87$; $RMSEA = .05$).

Second, we investigated the measurement invariance of our measure. Geiser and colleagues (2014) have highlighted the importance of providing evidence of measurement invariance over time prior to conducting LST analyses. Establishing measurement invariance ensures that the measure assesses the same construct at different measurement points regarding factor structure and item functioning. Strong factorial invariance requires equivalent factor structures, invariant factor loadings as well as invariant intercepts over time (Horn & McArdle, 1992). We created a series of models including more restrictive assumptions regarding measurement invariance (for more details on the procedure see Lance, Vandenberg, & Self, 2000). For Sample 2, strong measurement invariance of the career indecision measure over time was confirmed. For Sample 1, only configural invariance (invariant unidimensional factor structure over time) was confirmed, which suggests that the substantive meaning of the career indecision measure was not completely stable over time.

Assessing the stable component of career indecision: Career indecisiveness. Table 1 shows that career indecision assessed at three different time points on a manifest level correlated highly within Sample 1 (time lag: 7 weeks) and Sample 2 (time lag: 6 months),

providing the first support for a considerable inter-individual stability of career indecision over time. To address our research question and evaluate the stable component of career indecision, we performed LST analysis to determine the trait and situational specific sources of variance that can be identified at different measurement points. For Sample 1, the LST model yielded good fit statistics: $SB-\chi^2 = 244.434$, $df = 165$, $p < .001$; $CFI = .98$; $RMSEA = .04$. A latent trait factor for career indecision was found and accounted for 84%, 95%, and 81% of the variance at T1, T2, and T3, respectively. Hence, only 5% to 19% of the career indecision variance was due to situation-specific effects. For Sample 2, the variance explained by the trait was slightly smaller: a latent trait factor for career indecision was found and accounted for 68%, 82%, and 81% of the variance at T1, T2, and T3, respectively. The model also provided good fit statistics: $SB-\chi^2 = 235.467$, $df = 165$, $p < .001$; $CFI = .99$; $RMSEA = .03$. In Table 2, the consistency, specificity, and reliability coefficients for both samples are displayed. The consistency coefficients ranged between .36 and .66 for Sample 1 and were lower for Sample 2 (.36 - .51). Specificity ranged between .02 and .16 for Sample 1. At State 2, specificity was especially low for this sample; for Sample 2, specificity was slightly higher (.10 - .22). Reliability coefficients were acceptable to moderate for both samples (.44 - .74). In reply to our research question, the results show that career indecision in our samples consisted of trait and state variance. However, the high percentages of trait-variance imply that career indecision was not strongly affected by situational effects (due to the strong trait component). For both samples, the results suggested that career indecision has a quite stable component over time, and the career indecision measure captured mostly stable interindividual differences, which is typical for personality assessments.

Relationships between career indecisiveness and other variables. To evaluate Hypotheses 1 to 3 and establish the nomological net of the empirically derived trait career indecisiveness, we investigated the relationships among the trait factor and CSE, perceived occupational barriers, and occupational self-efficacy (see Figure 2). As observed in Table 1,

all correlations were significant for both samples. Specifically, we found significant negative relations between the trait component of career indecision and CSE (supporting Hypothesis 1), occupational self-efficacy (supporting Hypothesis 3) as well as positive correlations with perceived career barriers (corroborating Hypothesis 2).

2.3 Study 2: Incremental Predictive Validity of Career Indecisiveness for Life Satisfaction

The goal of Study 2 was to explore how the stable component of career indecision is related to life satisfaction beyond generalized indecisiveness.

2.3.1 Method

Participants and procedure. We contacted students ($N = 3,815$) enrolled in different majors at the same university as the students in Study 1. The response rate was 29% ($n = 1,105$) at T1. Participating students were contacted two additional times during the year, each six months apart, resulting in response rates of 36% and 20%. As in Study 1, all students who participated at T1 and provided at least one additional measurement point were selected for the final analysis ($n = 469$), with 149 participating in both follow-ups. This final sample was 66% female, with an average age of 23.81 years ($SD = 3.10$) and a mean number of enrolled semesters of 3.98 ($SD = 2.29$). Participants represented a wide range of fields of which the most common were management (25%), education (19%), and cultural sciences (18%).

Life satisfaction and self-evaluated generalized indecisiveness were assessed only at T3; career indecision was assessed at each wave. As in Study 1, we evaluated whether students who participated only at T1 differed significantly in career indecision assessed at T1 from those who participated in at least one additional wave. The results showed that the study dropouts did not differ from those who remained on age and gender. However, they reported significantly higher career indecision. Therefore, some retention bias should be taken into account when interpreting the results.

Measures.

Career indecision. We measured career indecision ($\alpha = .88$ at T1; $\alpha = .91$ at T2; $\alpha = .91$ at T3 in the current sample) using the same instrument described for Study 1.

Indecisiveness. To assess self-evaluated, generalized indecisiveness, we applied the IS developed by Frost and Shows (1993) containing 15 items (e.g., “*I often worry about making the wrong choice*”) evaluated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The 15 items were independently translated into German by the first author of this study and a research assistant who are both highly familiar with the construct and highly proficient in English. The final version was produced after resolving any discrepancies between the translations. An exploratory factor analysis revealed a unidimensional structure. However, we decided to exclude the 4 items that address domain-specific indecisiveness (e.g., “*I have a hard time planning my free time*”) because we aimed to assess generalized indecisiveness. Moreover, these items showed weak factor loadings ($\alpha < .50$). In the current sample, the Cronbach’s alpha of the final scale was $\alpha = .90$.

Satisfaction with life. Satisfaction with life was evaluated using the five-item German version (Schumacher, 2003) of the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), and the answers were provided on a five-point scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). An example question is “*The conditions of my life are excellent*”. Glaesmer, Grande, Braehler, and Roth (2011) reported a convincing scale reliability of $\alpha = .92$, discriminant validity regarding depressiveness, and a positive association with social support for the German version.

2.3.2 Results and Discussion

As in Study 1, we first established strong measurement invariance over time of the career indecision measure for our sample. We then evaluated the stable component of career indecision to compare these results to results of Study 1. For our sample, the LST model provided good fit statistics: $SB-\chi^2 = 245.863$, $df = 165$, $p < .001$; $CFI = .97$; $RMSEA = .04$. A

latent trait factor for career indecision was found and accounted for 70%, 89%, and 41% of the state variance at T1, T2, and T3, respectively. As observed in Table 2, specificity coefficients at State 3 are high, indicating more explained variance due to the situation and/or person-situation interaction at T3. However, this finding is generally compatible with that of Study 1 and further supports the existence of a strong trait factor in career indecision.

Predictive validity of career indecisiveness. To evaluate Hypotheses 4 and 5 regarding how trait career indecisiveness is related to life satisfaction and generalized indecisiveness, we computed correlations between those constructs on a latent level. The correlation coefficient between trait career indecisiveness and life satisfaction was $r = -.31$, $p < .001$ (supporting Hypothesis 4) and between trait career indecisiveness and generalized indecisiveness was $r = .35$, $p < .001$ (supporting Hypothesis 5). To answer our research question and test whether the predictive effect of trait career indecisiveness is comparable to the effect of generalized indecisiveness, we conducted a series of regression analyses of the latent constructs. First, we investigated the predictive validity of self-evaluated generalized indecisiveness, which was found to be a significant predictor of life satisfaction ($\beta = -0.30$; $p < .001$; $R^2 = 0.09$, $p < .05$). Second, we tested whether trait career indecisiveness captures the variance in student life satisfaction beyond generalized indecisiveness (see Figure 3). The effect of trait career indecisiveness on life satisfaction ($\beta = -0.24$; $p < .01$) remained significant after controlling for generalized indecisiveness ($\beta = -0.22$; $p < .01$). A total of 14% of the variance ($p < .05$) in life satisfaction was explained by the stable component of career indecision and generalized indecisiveness combined. Therefore, trait career indecisiveness explained 5% of the variance in life satisfaction beyond generalized indecisiveness.

2.4 General Discussion

The main goal of the present paper was to investigate the stable component of career indecision (i.e., career indecisiveness) among university students. Although career indecision is of major concern in career counseling, the methodologies for assessing indecisiveness in existing research have some notable limitations. Only a few longitudinal studies have examined indecisiveness over time, and these studies have only assessed indecisiveness using questionnaires directly asking participants to indicate their indecisiveness. Hence, the general aim of our study was to evaluate the empirically assessed stable component of career indecision (i.e., career indecisiveness) over time and to investigate its relationships with personality-, career-, and well-being-related variables. We examined three different groups of students over different periods to improve the generalizability of our results.

Assessing the Stable Component of Career Indecision: Career Indecisiveness

In Study 1, we addressed the research question of the extent to which career indecision is comprised of a stable component using LST analyses (cf. Steyer et al., 1999). Our analyses enabled us to draw a broader picture of career indecision and indecisiveness and extended existing research on the persistence and stability of generalized indecisiveness (e.g. Gati et al., 2012; Germeijs et al., 2006). The key finding across samples and time lags was that career indecision is influenced by a stable component and is less affected by situational influences. Comparison of the trait components in Sample 1 (time lag: 7 weeks) and Sample 2 (time lag: 6 months) reveals that for the shorter time interval, the trait component was somewhat larger. In sum, the results provide evidence of the trait-like nature of career indecisiveness that has been frequently assumed in the literature (Hartman, Fuqua, & Hartman, 1983; Osipow, 1999) but not clearly established due to shortcomings in the applied research methodologies.

Relationships between Career Indecisiveness and other Variables

As hypothesized, we found a negative correlation between the latent trait of career indecision and CSE similar to previous findings on career indecision (Di Fabio et al., 2012), confirming that a negative appraisal of individual worthiness is associated with more career decision-making problems. However, our study goes significant beyond previous studies because we could show a relationship between CSE and an empirically derived stable component of career indecision over time. This could imply that negative self-perceptions lead to problems in career decision-making. However, our studies do not permit claims about causality and it also is possible that problems in career decision-making could lead to negative self-perceptions.

Our study also reflects previous findings of a positive relationship between career indecision and perceived career barriers (Patton, Creed, & Watson, 2003). Extending previous research, our study clarified the link between perceived career barriers and trait career indecisiveness by revealing a positive relationship between these constructs. This suggests that the perception of career barriers is associated with an inability to make career decisions that is pervasive over at least short-term periods. Finally, career indecisiveness was negatively correlated with occupational self-efficacy, meaning that indecisive students show lower self-efficacy regarding their own abilities. This result suggests that students who believe in their own ability might show higher readiness to make career decisions. Conversely, individuals who do not trust their skills seem not to handle career choices well because they might avoid decision tasks and therefore remain undecided longer. Whether perceived barriers and low occupational self-efficacy are causes of career indecisiveness can, however, not be determined with our studies.

Predictive Validity of Career Indecisiveness for Life Satisfaction

Study 2 aimed to explore how the stable component of career indecision is related to self-evaluated generalized indecisiveness and life satisfaction. First, as expected, the results

showed that career indecisiveness was positively related to generalized indecisiveness. Additionally, our regression analyses revealed that, as hypothesized, trait career indecisiveness was a significant predictor of student life satisfaction, indicating that problems in making decisions regarding one's career influence subjective well-being in terms of life satisfaction. This finding expands existing research on the link between career decision difficulties and career-related satisfaction, for example, and satisfaction with chosen majors in college (Nauta, 2007). We showed that career indecisiveness is also significantly related to overall life satisfaction, meaning that students who are indecisive are more likely to be unsatisfied with their whole life. Considering that occupational decisions are among the important factors that influence people's lives (Hackett & Betz, 1995), this result highlights the potentially destructive nature of career indecisiveness for individual well-being. Finally, we extended the nomological net and provided a new in-depth understanding of the usefulness of the construct of career indecisiveness by demonstrating its incremental predictive validity beyond generalized indecisiveness (assessed at a single measurement point) regarding student life satisfaction.

2.4.1 Limitations

Some limitations apply for our studies. First, the nature of our samples limits the generalizability of the results. Due to the German educational system, university students have already made a number of career decisions prior to entering university (e.g., decided on a major, chose a university education and not vocational training). Consequently, the range and scope of career indecision might be more limited than in college samples from other countries. This might have affected the degree of stability in career indecision over time. Additionally, a majority of participants was female, especially in Study 1. Moreover, most of those who dropped out after the initial measurement point were male in Study 2 and dropouts were also systematically higher in career indecision at the first measurement point. Therefore, selection bias for the final sample in the examined variables should be taken into account.

Second, a time of 14 weeks (Study 1) and even one year (Study 2) is rather short for estimating more chronic forms of indecision. Moreover, some authors (e.g. Kenny & Zautra, 1995) recommend a minimum of four assessments to separate trait from state variance. Additionally, only configural invariance for Sample 1 of Study 1 was established. Therefore, the results of these LST analyses need to be interpreted with caution (Geiser et al., 2014). A third limitation of the study is that we did not assess career decision multidimensionally. For a more fine-grained understanding of career indecision, the assessment of different dimensions of career indecision would be important. Finally, future research could investigate additional factors in order to generate a more complete picture of the causes and consequences of chronic career indecision, for example, career information deficits (Brown & Rector, 2008).

2.4.2 Practical Implications and Conclusion

The most notable contribution of our studies to career counseling is the finding that career indecision consists of both trait and state components and that these can be measured and might require different counseling approaches. Because some part of career indecision is a state, it is likely that this will improve with time due to self-guided career exploration and planning as students advance in their university years. Career counselors could assist this process by providing career information and self-assessments for students. However, a large part of career indecision is relatively stable. This means that many students will not be able to resolve their career indecision simply by advancing through their university experience. It also suggests that these students would need more profound counseling than just providing information or a simple self-assessment. Addressing the stable component of career indecision needs to address negative self-views, perceived barriers, and self-efficacy.

Moreover, the study highlighted the significance of the trait of career indecision by demonstrating its relationship with life satisfaction. Counselors should be aware of this association when assisting clients. It seems possible that general life dissatisfaction is at least partially due to persistent problems in career decision-making. Additionally, chronic career

indecision might negatively impact student satisfaction with life. This calls for holistic career counseling approaches that integrate career and non-career issues to increase student's overall well-being.

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3 The Relationships of Vocational Interest Congruence, Differentiation, and Elevation to Career Preparedness Among University Students

Abstract

Vocational interest characteristics—interest congruence, interest differentiation, and general interest level (elevation)—are useful indicators for career development. However, research on these issues has primarily focused on adolescents in the transition from school to work and analyzed a limited set of career-related correlates. This study extends this line of research by exploring the relationships of interest congruence, interest differentiation, and interest elevation with several indicators of career preparedness (i.e., career planning, occupational self-efficacy beliefs, career decidedness, and career engagement) among a sample of emerging adults during their university studies in Germany. Data from 239 students representing a wide range of majors were collected via an online questionnaire. Controlling for sociodemographic variables, multiple regression analyses revealed that differentiation was positively associated with career decidedness and career engagement and elevation was positively related to occupational self-efficacy beliefs and career engagement. We discuss the findings regarding the importance of differences in vocational interest characteristics for the career preparedness of university students.

Keywords: vocational interests, career preparedness, secondary constructs

3.1 Introduction

The assessment of vocational interests is a core aspect of career counseling because interests are assumed to be important factors in the processes of career decision-making and career development (Holland, 1997; Savickas & Spokane, 1999). Moreover, vocational interests act as significant predictors of performance, persistence at work, and turnover intentions (Nye, Su, Rounds, & Drasgow, 2012; Van Iddekinge, Roth, Putka, & Lanivich, 2011). According to Holland's theory (1997), secondary interest constructs (e.g., interest congruence and interest differentiation) were introduced to provide additional information about a client's state of interest development that goes beyond information offered solely by the client's interest scores. Secondary constructs are assumed to be indicators of the level of career development and career choice readiness (Holland, 1997; Reardon & Lenz, 1999).

Although these constructs are important in career development theory, to date, only a limited number of studies (e.g., Bergmann, 1993) has empirically investigated the relationships of the secondary constructs with other career developmental variables, especially in German-speaking countries. Interestingly, most of the research regarding the relationships of the secondary constructs with career development (e.g., Hirschi & Läge, 2007; Tracey & Robbins, 2005) has focused on adolescents transitioning from school to work, and therefore, on variables of high importance to that target group (e.g., career maturity or career choice). Other research has examined relationships between secondary constructs and a variety of work-related behaviors (e.g., annual income and job satisfaction) among samples of workers (e.g., Donohue, 2006; Huang & Pearce, 2013).

However, we currently know comparatively little about how Holland's secondary constructs are related to emerging adults' career preparedness, for example, during their university studies. The time at university reflects a phase that is crucial to career development. At this stage vocational interests get crystalized and stabilized (Low, Yoon, Roberts, & Rounds, 2005) and students need to be actively concerned with preparing for the transition

from university to work by engaging in career-relevant activities (Hirschi, Freund, & Herrmann, 2014). Moreover, compared to adolescents who are confronted with the school to work transition, university students have a higher education, usually aim for more complex and autonomous jobs, and are confronted with more diverse and status-high occupational tasks. Hence, the need for career preparedness and especially proactive career behaviors such as career engagement and exploration increases (Hirschi et al., 2014).

Against this backdrop, first, we aimed to investigate the relationships of interest/study-major congruence, interest differentiation, and interest elevation with career preparedness among the understudied sample of university students in emerging adulthood. Second, we analyzed an extended set of indicators of career preparedness (i.e., career planning, occupational self-efficacy beliefs, career decidedness, and career engagement) that optimally reflects the career development tasks of university students. Overall, this study seeks to address the neglected issue of explaining career preparedness by specific interest attributes and constellations (i.e., secondary constructs). Investigating the meaning of secondary constructs regarding career preparation among university students would be valuable for both researchers and practitioners. Before explaining the assumed relationships from the secondary constructs to career preparedness we introduce the concept of career preparedness for a better understanding of the hypotheses.

3.1.1 Conceptualization of Career Preparedness

Lent (2013) described the concept of career-life preparedness as a vigilance that promotes the management of threats concerning one's career well-being. Following his assumption, preparation for one's life and career can result in proactive strategies to manage perceived barriers and to build support systems that successfully manage one's own career-life future. Accordingly, preparedness is regarded as a key element in successful career management (Vondracek & Porfeli, 2003). For instance, career preparedness as a developmental task is assumed to have positive effects on an adult's mental health and sense

of well-being (e.g., Herr, 1989; Vondracek, Lerner, & Schulenberg, 1986). Career preparedness can specifically be characterized by a combination of career decidedness, career planning, and career-related confidence (Skorikov, Patton, & Skorikov, 2007).

Career planning reflects a planning attitude and a future orientation to attain one's established goals. In the framework of career adaptability, Savickas (1997) has highlighted the importance of career planning for mastering career challenges. *Career decidedness* indicates a clear view of personal interests and preferences. Conversely, undecided individuals tend to have unclear and not well specified vocational aspirations (Creed, Prideaux, & Patton, 2005). Compared to career planning, career decidedness does not refer to developing a strategy of how to reach one's personal career goals. *Confidence* (i.e., self-efficacy; Bandura, 1986) is regarded as self-evaluations that lead to a belief in one's own abilities to complete tasks or to attain a defined level of achievement in specified domains. According to social cognitive career theory (SCCT; Lent, Brown, & Hackett, 1994) self-efficacy is crucial in the career decision-making process. In our study, we specifically focus on occupational self-efficacy, the degree to which an individual is confident about mastering challenges in the occupational domain. Compared to career planning and decidedness, occupational self-efficacy beliefs are not directly related to career-related goals. They are more a self-evaluation of one's own skills that might be related to one's goals but also to broader occupational tasks or demands of the occupational environment.

In addition to Skorikov's et al. (2007) conceptualization, we analyzed career engagement as an extended indicator of career preparedness, because it refers not to attitudes like career planning, decidedness, and self-efficacy beliefs, but to the exhibition of specific behaviors that enhance a person's career development (Hirschi et al., 2014). Furthermore, as stated above proactive engagement in career behaviors is an important aspect in the university-to-work transition (Hirschi, Lee, Porfeli, & Vondracek, 2013). *Career engagement* is a higher-order construct, which includes several proactive career behaviors such as

networking and exploration that are specifically relevant to career development (Hirschi et al., 2014) and career success (Zikic & Klehe, 2006). The here analyzed components of career preparedness are assumed to be positively correlated but nonetheless represent distinct constructs (Hirschi & Herrmann, 2013).

3.1.2 Holland's Secondary Constructs and Career Preparedness

Since its introduction, Holland's theory of vocational interests has changed counseling and career psychology (Nauta, 2010). The theory's basic assumption is that the vocational interests of most people can be characterized by a combination of six types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (the RIASEC typology; Holland, 1973). Holland described each type of these interests with specific abilities and values, as well as with preferred activities, and characteristics. These types of interests are organized in a hexagonal structure. Distances between interests display the degree of similarity between them. For example, social and artistic are most related, while artistic and conventional are least related and, therefore, are on opposite positions on the hexagon. Typically, based on a person's interest scores, a code consisting of the first three RIASEC letters—those that optimally characterize the person—is calculated. This personal interest code can be matched to interest codes of the working environment to find a career that fits the individual's abilities, interests, and values.

Most relevant to our study, the theory of Holland also provides a theoretical rationale that secondary interest constructs (i.e., interest congruence, differentiation, and elevation) should be related to career preparedness. Specifically, secondary constructs provide additional information about a person's state of interest development that is linked to career choice readiness (Holland, 1997; Reardon & Lenz, 1999). Therefore, secondary constructs should provide useful additional understanding how interests are linked with career development and variables related to the career decision-making processes (Reardon & Lenz, 1999), like career preparedness. Besides Holland's theory, social cognitive career theory (SCCT, Lent et al.,

1994) that deals with interests, self-efficacy beliefs, and goals provides an additional theoretical rationale why some of the here assumed relationships should occur. Before arguing for every specific relationship, we will introduce the here analyzed secondary constructs in more detail.

Interest congruence. Interest congruence is described as the degree of fit between an individual's interests and the characteristics of his or her work environment (Holland, 1997). As Holland (1997) stated, high congruence between a person's characteristics and his or her working environment should lead to positive outcomes such as satisfaction at work. Empirically, positive outcomes of interest congruence (i.e., less turnover, higher performance, higher job satisfaction) have been found in numerous single studies and meta-analyses (Nye et al., 2012; Van Iddekinge et al., 2011). In sum, the significance of congruence for explaining work-related variables has been empirically supported by several studies but comparatively little is known about how congruence is specifically related to career preparedness. An exception is a study that has investigated congruence as the degree of fit between expressed (career aspirations) and measured vocational interests among secondary students (Hirschi & Läge, 2007). That study has revealed a positive correlation between congruence and career decidedness. However, this study did not analyze the congruence between interests and the occupational environment.

University students who are enrolled in a study-major that closely corresponds to their interests (i.e., who show a high interest/study-major congruence) can be expected to have more positive study experiences and feel reassured in their study choice. This should also be related to an increased sense of certainty about their future career because for most students future career plans will be linked with their current study major. Due to the positive experience of interest/study-major congruence, students with high interest/study-major congruence should also feel more confident that they can master challenges at work. Research showed that interests are systematically related to abilities (Prediger, 2002) and self-efficacy

perceptions (Sheu et al., 2010) in a particular vocational domain. When students feel that their study major corresponds to their interests they should thus be more likely to express confidence in mastering challenges at work in their aspired occupation. With respect to career engagement, we also expect a positive relationship to interest/study-major congruence, because students with high interest congruence are also interested in finding an after-university working environment that fits to their major and their interests. Therefore, these students are assumed to engage in more active career behavior to secure a good person-job/organization fit following their studies. Using the same reasoning, students with high interest/study-major congruence can also be expected to be more active in career planning. Therefore, we propose the following hypothesis:

Hypothesis 1: Interest congruence is positively related to career preparedness in terms of (a) career planning, (b) career decidedness, (c) occupational self-efficacy beliefs, and (d) career engagement.

Interest differentiation. Interest differentiation is the degree to which a person or environment's characteristics are clearly distinct. High differentiation reflects greater distinctness and therefore higher clarity within the career decision-making process (Holland, 1997). Students with differentiated interests are aware of their likes and dislikes regarding professional activities. Therefore, a large discrepancy between the highest and lowest interest types occurs. Holland (1997) stated that individuals with differentiated interests are more likely to show higher career satisfaction and to have less problems in choosing a vocational career, and therefore, should show higher levels of career decidedness. In the context of career development, Bergmann (1993) provided evidence that differentiation might be important for high-school students' career maturity by revealing positive relationships between differentiation and career attitudes such as decidedness. Related to this, previous research has shown that differentiation is negatively related to two of Marcia's (1980) identity statuses (diffusion and foreclosure) that are negatively related to career decidedness (Nauta & Kahn,

2007). We also assume that students with differentiated interests are more likely to show higher career planning because they know their specific interests and can more easily plan for their future career. This assumption is in line with the SCCT (Lent et al., 1994), which suggests that undifferentiated interests hinder the development of career plans (Lent, 2013). Additionally, also according to SCCT, students with high differentiation can be expected to be more engaged in career behaviors because they attempt to fulfill their clear differentiated career aspirations. By contrast, students who are unclear about their vocational preferences might be less motivated or directed to engage in career behaviors. Finally, we assume interest differentiation to be positively related to occupational self-efficacy beliefs because individuals with clear vocational aspirations also confront themselves with occupational challenges that can be seen as one source of self-efficacy beliefs. According to SCCT, the mastery of such challenges is a major source of self-efficacy beliefs. In sum, we hypothesize the following:

Hypothesis 2: Interest differentiation is positively related to career preparedness in terms of (a) career planning, (b) career decidedness, (c) occupational self-efficacy beliefs, and (d) career engagement.

Interest elevation. Interest elevation represents the overall level of the interest scores (Fuller, Holland, & Johnston, 1999). Interest elevation is regarded as a general interest factor that displays openness and the flexibility of one's interests by reflecting whether a person shows higher or lower values for different interest types in general (Darcy & Tracey, 2003). Bullock and Reardon (2005) describe profile elevation as an indicator of a person's energy level. Students with high interests in general should be more motivated to search for strategies that help them reach their career goals (such as working in an environment that suits their interest), because they develop goals in different interest domains. Among high-school students, high interest elevation was positively correlated with career planning and career exploration (Hirschi & Läge, 2007). Because of an individual's higher activation level in case of high elevation, the latter should also be positively related to self-efficacy beliefs and career

engagement. Hirschi (2009) showed that interest elevation is positively related to exploration behavior, which is a component of career engagement (Hirschi et al., 2014). According to SCCT a high activation level is an optimal precondition for the development of occupational self-efficacy beliefs. We also assume that students showing high interest levels across many interest domains will show higher career decidedness because such students might be more active in their career decision-making processes due to higher values in openness and general interests. In sum, we hypothesize the following:

Hypothesis 3: Interest elevation is positively related to career preparedness in terms of (a) career planning, (b) career decidedness, (c) occupational self-efficacy beliefs, and (d) career engagement.

3.2 Method

3.2.1 Participants and Procedure

We recruited students from different universities in Germany: The students were contacted through email ($N = 8,197$) to addresses provided in a previous study on career development. There was a 10% ($n = 829$) response rate. Of these participants, a random sample completed the interest inventory and the career preparation scales. Only participants with complete responses for the used measures were considered with a final $n = 239$; 64% female, mean age 24.06 years ($SD = 3.57$) and mean study semesters 4.82 ($SD = 2.05$); 72% of the participants were undergraduates and 28% were studying for master's degrees. The students were enrolled in 35 different majors, with the largest groups studying education (16%), business administration (15%), cultural studies (14%), business psychology (10%) and environmental science (8%). As incentives, 1,150 Euros were offered to participants in various lottery drawings.

3.2.2 Measures

Vocational interests. To assess the interests of the participating students, we applied the "Allgemeiner Interessen-Struktur-Test—Revidierte Version" (AIST-R, General Interest-

Structure-Inventory – Revised Version; Bergmann & Eder, 2005). This well-established inventory includes 10 items for each interest type. Participants were asked to indicate on a 5-point scale how much they are interested in typical RIASEC activities (e.g., “*learn a foreign language*”). The scale we applied ranged from 1 (*This does not interest me at all; I don't like to do that*) to 5 (*This interests me a lot; I like to do that very much*). Evidence for validation was provided by the test authors, for instance, by revealing a high relationship between the scores of the AIST-R and the German-language adaptation of the Self-Directed Search scales (Jörin, Stoll, Bergmann, & Eder, 2004). To calculate our participants' major interest types, we used standard values from the raw score.

Congruence. Normally, congruence describes the degree of fit between a person's interest and his or her actual working environment (Holland, 1997). Because our study examined university students, we measured the fit between a student's vocational interests and his or her major field of study. We specifically calculated congruence between the Holland code and the interest code for each student's major. The former consists of the first letters of the three RIASEC interest types that the participant most resembles (assessed by the AIST-R; Bergmann & Eder, 2005). The three-letter codes for the majors were identified according to the register of vocational codes of EXPLORIX provided by Jörin et al. (2004). Because these EXPLORIX codes did not always fit exactly with our participants' majors, the three authors of this study independently defined the study-major codes and a final solution was reached after consolidating the various codings. Regarding the initial interrater agreement, from 36 study majors, 4 codes were identical (letters and its positions), 6 codes were identical on the first two letters, 9 codes were identical on the first letter while the other 17 used exactly the same three letters but in different positions.

In the literature, numerous congruence indices exist (cf. Brown & Gore, 1994; Holland, 1997; Rolfs, 2001). Here, we report one of the frequently used indices: the C-index by Brown and Gore (1994). This index is regarded as the best way to calculate congruence

(Eggerth & Andrew, 2006) because it has several advantages: (1) based on the hexagonal structure, the index considers all of the three letters; (2) the index is sensitive to the order of the codes; and (3) it is economical to calculate (c.f. Eggerth & Andrew, 2006). To calculate the C-index, one must compare the first, second, and third letters of the person with those of the environment code. Next, these comparisons are weighted: The comparison between the first letters is multiplied by three, the next by two, and the final comparison among the third letters is multiplied by one. The sum of the products represents the value of the C-index. We applied the following formula: $C = 3(X_1) + 2(X_2) + (X_3)$, where X_i displays the score (3, 2, 1, and 0) based on the distance between the interest code and study-major code position on the hexagon. For instance, the comparison between the interests *Realistic* (person) and *Artistic* (environment) results in a score of 1. The comparison of *Investigative* (person) and *Investigative* (environment) results in a score of 3. The congruence based on the C-index ranges between 0 and 18, with higher values suggesting greater congruence between person and environment. Within our sample, the mean degree of congruence with the C-index was $M = 9.46$ ($SD = 3.91$).

Differentiation. To evaluate the level of differentiation, we applied the *dispersion-index* (Holland, 1997). This index represents the standard deviation of the standard values of all six interest scores. Within our sample, the dispersion-index ranged between 1.87 and 16.69. The mean standard differentiation in our sample was $M = 8.00$ ($SD = 0.87$).

Elevation. To calculate interest elevation as the overall level of a student's interest, we summed the standard scores from the six interest dimensions (Fuller et al., 1999). The resulting scores can range from 420 to 780. In our sample, interest elevation lay between 521 and 722 ($M = 605.03$; $SD = 30.28$).

Career planning. To measure career planning, we applied the German adaptation (Abele & Wiese, 2008) of the 6-item scale developed by Gould (1979) and Wayne, Liden, Kraimer, and Graf (1999). Participants were asked to indicate their career planning (e.g., "I

know what I need to do to reach my career goals.”) on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Construct validity was supported in terms of significant associations with career success among a sample of German professionals (Abele & Wiese, 2008). Cronbach’s α was .87.

Career decidedness. The German version of the My Vocational Identity Scale (Holland, Daiger, & Power, 1980; Jörin et al., 2004) was applied to measure career decidedness. This scale consists of 7 negatively formulated items (e.g., “*I still need to figure out which professional direction I should pursue*”) and a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The tool is frequently applied in career counseling and vocational research and its construct validity has been supported by significant correlations, for example, with career planning and exploration (Hirschi & Läge, 2007). Cronbach’s α was .89.

Occupational self-efficacy beliefs. We measured occupational self-efficacy with a six-item scale (e.g., “*Whatever comes my way in my job, I can usually handle it*”) developed and validated by Rigotti, Schyns, and Mohr (2008). Participants were asked to respond on a six-point Likert scale ranging from 1 (*not at all*) to 6 (*completely*). The authors of the scale reported a Cronbach’s alpha reliability estimate of .86 and evidence for construct validity in terms of positive relationships to job satisfaction, organizational commitment, and job performance among German employees (Rigotti et al., 2008). The scale was already successfully applied among German university students and showed a high construct validity in these studies (e.g., Hirschi & Herrmann, 2013). Cronbach’s α was .83.

Career engagement. We applied the career engagement scale (Hirschi et al., 2014), including nine items that assesses the general degree to which an individual has shown proactive behaviors to develop his or her career in the previous six months (e.g., collecting information about potential employers). Answers were provided on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*very often*). A Cronbach’s α of .87 and construct validity

were determined with positive correlations to job and career satisfaction and specific career behaviors, such as networking among German employees (Hirschi et al., 2014). Cronbach's α was .89.

Control variables. In addition, we used our participants' gender (coded: 1 = female, 2 = male) and semester (of studying, open question) as control variables because these variables might affect interest development and career preparedness (Hirschi et al., 2013; Low, Yoon, Roberts, & Rounds, 2005).

3.3 Results

3.3.1 Preliminary Analysis

To ensure the distinctness of career preparation measures, we had to demonstrate that career planning, career decidedness, occupational self-efficacy beliefs, and career engagement are distinct constructs, each of which captures something different. Therefore, we conducted a series of confirmatory factor analyses and compared the model fits of a single-factor model, several two-factor models (pairing two or three of the measures versus two or one measures; e.g., career planning, career decidedness, and occupational self-efficacy beliefs as one factor and career engagement as the second factor), and several three-factor models (e.g., career planning and career decidedness as one factor, occupational self-efficacy beliefs as the second factor and career engagement as the third factor) with a model distinguishing among career planning, career decidedness, occupational self-efficacy beliefs, and career engagement. Model comparisons were based on the χ^2 -difference test using the robust maximum likelihood estimator MLR and the Satorra-Bentler correction (Satorra & Bentler, 2001). Overall, the fit of the four-factor model ($\chi^2 = 566.87$, $df = 344$, CFI = .92; TLI = .92; RMSEA = .06) provided a significantly better fit than all of the other models (CFIs from .59 to .85, TLIs from .54 to .88, RMSEA from .08 to .13). Because gender differences are frequently found in studies on vocational interests (e.g., Lippa, 1998; Su, Rounds, & Armstrong, 2009), we also evaluated whether the six types of interests in our sample are affected by gender. Therefore,

we compared the mean standard values of the interest scales separated by gender. In line with previous findings in other samples (e.g., Lippa, 1998), male students showed significantly higher scores in realistic, $t(224) = -5.36, p < .001$, and investigative interests, $t(224) = -4.00, p < .001$, whereas females scored higher in artistic, $t(224) = 2.87, p = .004$, and social interests, $t(224) = 2.57, p = .011$. No gender differences were found in enterprising and conventional interests.

3.3.2 Career Preparedness and the Secondary Constructs

Means, standard deviations, Cronbach's alpha estimates, and correlations between measures are displayed in Table 3.

In general, we did not find consistent correlations between secondary constructs and components of career preparedness (see Table 3). However, in particular, interest elevation showed the highest correlation to some components of career preparedness (occupational self-efficacy beliefs, $r = .25$; and career engagement, $r = .24$). Significant but small correlations were found between interest differentiation and specific components of career preparedness (career decidedness, $r = .17$; career engagement, $r = .16$).

To test Hypotheses 1 to 3, we conducted a series of multiple regression analyses, one analysis for each of the four criterion variables (i.e., career planning, career decidedness, occupational self-efficacy beliefs, and career engagement). To conduct the multiple regression analyses (Table 4), we first entered the control variables (age, semester) into the equations. The results showed that occupational self-efficacy beliefs were significantly predicted by gender. Men had higher self-efficacy beliefs than women. The other criteria were not significantly predicted by the control variables. In a next step, we added the predictors (i.e., interest congruence, interest differentiation, and interest elevation; see second step in Table 4) simultaneously in the equations. By controlling for gender and semester and entering all predictors simultaneously into the regression equation, we were able to obtain a better understanding of the specific effects of each variable.

Table 3: Summary of Intercorrelations, Means, Standard Deviations, and Cronbach's Alpha among the Constructs assessed

	Mean	SD	1	2	3	4	5	6	7
1 Congruence	9.46	3.91	(-)						
2 Differentiation	8.00	2.87	.19**	(-)					
3 Elevation	605.03	30.28	.08	-.14*	(-)				
4 Career planning	3.35	0.85	.06	.06	.05	(.87)			
5 Career decidedness	3.54	0.87	.05	.17**	.07	.73**	(.89)		
6 Self-efficacy beliefs	4.31	0.73	-.05	.02	.25**	.40**	.54**	(.83)	
7 Career engagement	3.20	0.84	-.06	.16*	.24**	.47**	.37**	.38**	(.89)

Note. $N = 239$; entries in parentheses are the Cronbach's alpha reliability coefficients.

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed)

Table 4: Results of Multiple Hierarchical Regression Analysis for Predicting Career Preparedness by Secondary Constructs

Predictor	Career Engagement			Career Decidedness			Self-Efficacy Beliefs			Career Planning		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Step 1												
Constant	29.12	1.87		26.07	1.53		22.35	1.12		21.52	1.31	
Gender	-1.70	1.04	-.11	-1.00	.85	-.08	1.51	.62	.17*	-.74	.73	-.07
Semester	.43	.25	.12	.06	.20	.02	.32	.15	.14*	-.07	.17	-.03
<i>R</i> ²		.03			.01			.05**			.01	
<i>F</i> for first step	<i>F</i> (2, 213) = 2.70			<i>F</i> (2, 213) = .72			<i>F</i> (2, 213) = 5.61**			<i>F</i> (2, 213) = .61		
Step 2												
Constant												
Gender	-1.41	1.01	-.09	-.58	.86	-.05	1.56	.61	.17*	-.62	.75	-.06
Semester	.24	.24	.07	-0.00	.20	.00	.23	.15	.11	-.10	.18	-.04
Congruence	-.23	.13	-.12	-.01	.10	-.01	-.07	.08	-.06	.04	.09	-.03
Differentiation	.54	.17	.21**	.39	.15	.19**	.16	.11	.10	.12	.13	.07
Elevation	.06	.02	.26***	.01	.01	.07	.03	.01	.23**	.01	.01	.09
<i>R</i> ²		.12***			.04			.11**			.02	
ΔR^2		.09***			.03			.06**			.01	

Note. *N* = 239. *B* = unstandardized coefficient, *SE B* = standard error of unstandardized coefficient, β = standardized coefficient
 * *p* < .05. ** *p* < .01. *** *p* < .001.

Contrary to Hypothesis 1, *congruence* was a nonsignificant predictor of career planning ($\beta = .03$, *ns*), career decidedness ($\beta = -.01$, *ns*), occupational self-efficacy beliefs ($\beta = -.06$, *ns*) and career engagement ($\beta = -.12$, *ns*). However, interest *differentiation* was positively associated with career decidedness ($\beta = .19$, $p < .01$) and career engagement ($\beta = .21$, $p < .01$), suggesting that individuals showing greater distinctness in their interests are more likely to have decided on their careers and tend to show more career engagement. Interest differentiation was not significantly related to career planning and occupational self-efficacy beliefs. Hence, Hypotheses 2b and 2d were supported, whereas Hypotheses 2a and 2c received no support.

Finally, interest *elevation* related positively to occupational self-efficacy beliefs ($\beta = .23$, $p < .001$) and career engagement ($\beta = .26$, $p < .001$), thus supporting Hypotheses 3c and 3d. Therefore, students who had a higher level of interest in general tend to be more confident regarding occupational tasks and show higher engagement in proactive behavior. Interest elevation was not significantly related to career planning and career decidedness, refuting Hypotheses 3a and 3b.

Combined, the assessed secondary interest variables explained 6% of the variance in occupational self-efficacy beliefs ($\Delta R^2 = .06$, $p < .01$), 3% of the variance in career decidedness ($\Delta R^2 = .03$, *ns*), 9% of the variance in career engagement ($\Delta R^2 = .09$, $p < .001$), and 1% of the variance in career planning ($\Delta R^2 = .01$, *ns*) beyond the controlled sociodemographic variables.

3.4 Discussion

Our study investigated the relationships of Holland's (1997) secondary interest constructs (i.e., interest/study-major congruence, interest differentiation, and interest elevation) with attitudes and behaviors of career preparedness among university students in emerging adulthood. We assumed that components of career preparedness (i.e., career planning, occupational self-efficacy beliefs, career decidedness, and career engagement;

Hirschi et al., 2014; Skorikov et al., 2007) play a significant role during university studies, because students begin to prepare for the university-to-work transition. The basic idea of our study was that the secondary interest constructs can be regarded as indicators for the state of vocational interest development and thus are theoretically linked with career preparedness (Holland, 1997; Reardon & Lenz, 1999).

Our results regarding the predictive validities of the secondary constructs revealed mixed results: Interest congruence was not significantly related to career preparedness, whereas interest differentiation and elevation were each positively related to two indicators of career preparedness.

The finding that interest congruence was not related to any component of career preparedness is somewhat surprising because theoretical assumptions from Holland's theory as well as SCCT provide rationales for these relationships. Moreover, a study found some of the expected relations within a sample of adolescents (Hirschi & Läge, 2007). Therefore, it might be possible that the relationship between congruence and career preparedness is specific for adolescent samples and not transferable to young adults and other educational backgrounds. However, because this reasoning lacks a clear theoretical underpinning, we think it might be more a methodological artefact resulting from the complex endeavor to classify multidisciplinary and more and more diverse study majors by three Holland letters. Related to this, study-major congruence was low among our sample. This can be explained by the heterogeneity in interest types within some study fields. For instance, among students engaged in cultural studies, we identified 16 different combinations of three-letter Holland codes in their interest profiles.

Interest differentiation was positively associated with career decidedness, meaning that university students with a large discrepancy between different interest types are also more decided and have a clearer picture of their occupational goals. This finding is in line with Holland's assumption (1997) that differentiation is associated with higher clarity within the

decision-making process. Furthermore, this result mirrors Bergmann's (1993) findings among Austrian high-school students – but is different from results of a study about secondary constructs and career maturity among Swiss secondary students (Hirschi & Läge, 2007). This suggests that in contrast to secondary students, interest differentiation might have another function for university students. Additionally, interest differentiation was positively linked with career engagement. Therefore, students with differentiated interests are more engaged in career behaviors. This might be explained by the possibility that differentiated interest profiles provide a clear picture of how to fulfill career aspirations.

In our study, interest differentiation did not show any relationship with career planning or occupational self-efficacy beliefs. It might be that career planning can be relevant for students with low differentiation as they are also very concerned about future career options. Regarding occupational self-efficacy beliefs, the nonsignificant relationship was marginally (non)significant. Therefore, taking into account the sample size of our study, we would caution against drawing strong conclusions from this finding.

Interest elevation was related to occupational self-efficacy beliefs and career engagement. This relationship is in line with SCCT (Lent et al., 1994), which states a close connection between vocational interests and occupational self-efficacy beliefs. Moreover, high interest elevation goes along with high levels of activation, which might be a suitable explanation why students who have a broad interest in many domains also have higher efficacy beliefs and show a higher level of engagement in career activities. Furthermore, the relationship of interest elevation to broader occupational self-efficacy beliefs makes especially sense because tasks and demands in occupations are usually associated with more than one interest type.

An explanation for the nonsignificant correlations of interest elevation with career planning and career decidedness is that interest elevation may also represent vocational flexibility (Darcy & Tracey, 2003), which may also distract from a focused career planning

and reduce decidedness. In sum, different processes associated with interest elevation which work in opposite directions, may lead to nonsignificant relationships of interest elevation to career planning and decidedness.

Overall, our findings partially supported the assumption that secondary constructs are associated with career preparedness (Hirschi et al., 2014). In particular, career engagement as a behavioral component of career preparedness showed the strongest, most frequent, and diverse relationships with the secondary constructs. Moreover, we found that with regard to explained variance occupational self-efficacy beliefs can be relatively well predicted by the secondary constructs. Initially, we therefore cautiously conclude that Holland's secondary constructs are differentially related to different components of career preparedness among university students.

3.4.1 Limitations

Besides the mentioned contributions of our study, some limitations should also be discussed. First, the study is based on cross-sectional data, which limits the causal interpretation of the results. Although we theoretically argued for the interest-career preparedness direction, some associations can be reasoned in both directions. Therefore, other studies might also collect longitudinal data to investigate reciprocal relationships between secondary constructs and career preparedness. Also, although the constructs studied here can be considered distinct from each other, common method bias cannot be ruled out because all variables were collected as self-report data at the same time (Podsakoff, MacKenzie, & Podsakoff, 2012). Related to this point, methodological artefacts resulting from the possible confounding of interest elevation and acquiescence bias in the career preparation measures might have occurred. Because items of the AIST-R and most career preparedness scales were positively formulated, the relationships between interest elevation and variables of career preparedness might have been overestimated in our study.

Second, the coding of study-majors according to the RIASEC typology was sometimes challenging. The study majors were coded by the three raters who were not experts for each of the study fields. Consequently, different raters coded many study majors with different Holland codes and the final coding was based on a common agreement. Additionally, majors such as cultural studies, business psychology, and environmental science can represent a range of different interest types that are difficult to display in a single three-letter interest code. Hence, future research should pay much close attention to the generation of the Holland codes. For example, Holland codes could be assessed empirically by using the “Umwelt-Struktur-Test” (Environment-Structure-Inventory; Bergmann & Eder, 2005) or experts of the study fields such as teaching staff could be interviewed (for more details see Rolfs & Schuler, 2002). Furthermore, AIST-R (Bergmann & Eder, 2005), as the herein applied interest inventory, is very broad in terms of included interest related activities (e.g., “*counsel other people*”) which might not perfectly match activities in study majors. However, these limitations only explain the nonsignificant findings regarding interest congruence but are not a valid limitation for the results of the other secondary constructs.

Third, the interpretation of the results should be made with a certain degree of caution because the here found effect sizes are rather small to moderate and our study is one of few studies dedicated to this topic (Hirschi & Läge, 2007). However, other studies that deal with similar constructs have found similar effect sizes between secondary constructs and career-related variables (e.g., Hirschi & Läge, 2007). Nonetheless, future research should replicate the here found results and analyze moderation effects, which might explain under which condition the here found effects might be stronger or weaker.

Fourth, the low response rate of our study questions the generalizability of the results to the whole population of university students in Germany. It might have been that specific population subgroups were attracted by the study, and therefore, were oversampled. For instance, students with low interest congruence or career decidedness might have been

attracted by the survey with the aim to get a clearer picture about their occupational attitudes and interest. Related to this point, it might be possible that some students replied to the occupational self-efficacy scale in reference to a current part-time job while others responded in anticipation of their future graduate employment. This might systematically change the content validity of this measure between different groups of students and bias some of the results. However, based on research on generalized self-efficacy (Chen, Gully, & Eden, 2004), it seems reasonable to assume a strong overlap between such potentially different reference frames for occupational self-efficacy.

3.4.2 Practical Implications

Our study expanded knowledge from earlier studies (e.g., Hirschi & Läge, 2007) and can provide some implications not only relevant for research but also for career counseling practice with university students. First, as we highlighted the importance of some secondary constructs for some components of career preparedness among emerging adults in higher education, career counseling endeavors that tap the secondary constructs might also foster positive career development among university students. Therefore, career counseling programs at universities might include components that especially are directed to the clear differentiation of interests or to develop multiple career-related interests.

Second, by analyzing a behavioral component of preparedness (i.e., career engagement), we were able to draw a broader picture compared to studies that have investigated career-related attitudes in relation to secondary interest constructs (e.g., Hirschi & Läge, 2007). This leads to the implication that important career behaviors like networking and information seeking could be affected by interest profile shaping within counseling activities.

Finally, career counselors working with university students can take the secondary constructs as a valuable source of information about their clients' state of career development. According to our study, different interest profiles also inform the counselor about different

career developmental outcomes (i.e., career decidedness, occupational self-efficacy beliefs, and career engagement). Although a detailed inspection of interest profiles cannot replace other types of counseling assessments they nonetheless might provide useful additional information about further career development of the clients. Optimally, career interventions for students should include several diverse components like fostering social support or increasing job search occupational self-efficacy beliefs and clarifying future occupational aspirations (Hirschi et al., 2013).

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4 Protean Career Orientation, Vocational Identity, and Self-Efficacy: An Empirical Clarification of their Relationship

Abstract

There is a large interest in how people can be more protean in their career development, exhibiting a self-directed striving for personally valued career outcomes. However, existing research on the protean career needs to better address issues of antecedents and outcomes as well as unique effects of a protean career orientation (PCO). We present two studies investigating how PCO is related to vocational identity clarity and occupational self-efficacy. Study 1 reports a 1-year, three-wave cross-lagged study among 563 university students and established that PCO preceded changes in identity and self-efficacy – but not the other way around. A 6-month longitudinal study of 202 employees, Study 2 showed that identity clarity and self-efficacy mediated the effects of PCO on career satisfaction and proactive career behaviours. PCO only possessed incremental predictive validity regarding proactive career behaviours. However, we could not confirm specific direct or mediated effects of PCO on job satisfaction. These results imply that PCO is closely related to vocational identity clarity and self-efficacy because it enhances these career attitudes. Moreover, identity and self-efficacy mediate some but not all of the effects of PCO on important career outcomes.

Keywords: protean career orientation; vocational identity; occupational self-efficacy; job satisfaction; career satisfaction

4.1 Introduction

Scholars in management, vocational, and organizational psychology have developed a strong interest in the notion of a protean career orientation (PCO), which describes an outlook in which the person, not the organization, is in charge of career development. Such individuals are flexible and learning-oriented in their careers and direct their careers according to personal values to achieve subjective career success (Hall, 1996). Because this orientation corresponds with the current dynamic, individualistic, and self-reliant career environment, PCO is generally assumed to be beneficial in terms of achieving subjective career success—a notion that is supported by emerging empirical research (e.g., Baruch, Grimland, & Vigoda-Gadot, 2014; Briscoe, Henagan, Burton, & Murphy, 2012; De Vos & Soens, 2008; Park, 2009).

One common theme in the literature on PCO is the notion that the ability to exhibit a protean career is closely related to factors such as identity clarity, self-efficacy, adaptability, or locus of control because they are presumed to allow people to develop a protean, self-reliant career (Gubler, Arnold, & Coombs, 2014; Hall, 2004; Waters, Hall, Wang, & Briscoe, 2015). However, the literature is inconsistent about whether these constructs are a feature of PCO or correlates, antecedents, or outcomes of PCO (Gubler et al., 2014). Unfortunately, most existing studies have not directly addressed this important issue. This gap is related to the underexplored question of the incremental validity of PCO regarding career outcomes beyond other established constructs (Gubler et al., 2014; Herrmann, Hirschi, & Baruch, 2015). Moreover, the relationships of PCO with other psychological variables would elucidate the underlying processes concerning why PCO is related to theoretically important career outcomes. In summary, despite widespread interest in the protean career, the present state of research is limited in terms of our understanding of the conceptual nature and functioning of this prominent career orientation (Gubler et al., 2014).

Addressing these issues, the present paper presents two studies that comprise samples in different career stages (i.e., university students and working professionals). These studies (a) examine the empirical relationships and distinctness of PCO with two career attitudes conceptually closely related to PCO: vocational identity clarity and occupational self-efficacy; (b) address the issue of temporal precedence that links PCO, vocational identity clarity, and occupational self-efficacy in a cross-lagged design and three measurement points spanning 1 year; (c) examine whether vocational identity clarity and occupational self-efficacy mediate the effects of PCO on important career outcomes (i.e., engagement in proactive career behaviours, job satisfaction, and career satisfaction) with a 6-month longitudinal study; and (d) investigate to what extent PCO has incremental effects on these career outcomes beyond vocational identity clarity and occupational self-efficacy.

Thus, this paper makes three key contributions. First, we theoretically and empirically clarify the relationships between PCO and two conceptually related attitudes (i.e., identity clarity and self-efficacy) by examining their temporal precedence. Second, we provide new empirical insights into the functioning of PCO in relation to identity clarity and self-efficacy by addressing the role of identity clarity and self-efficacy in our understanding of why PCO is related to important career outcomes. Third, we add knowledge regarding the incremental utility of PCO beyond related and established career attitudes to predict career outcomes.

4.1.1 PCO, Vocational Identity Clarity, and Occupational Self-Efficacy

Different conceptualizations of PCO exist regarding its definition and dimensionality (see Gubler et al., 2014, for a review). In accordance with other studies that used a unitary approach (e.g., DiRenzo, Greenhaus, & Weer, 2015; Hall, Kossek, Briscoe, Pichler, & Lee, 2013; Waters, Briscoe, Hall, & Wang, 2014), we herein consider PCO as a one-dimensional construct which can be defined as “an individual’s proclivity to enact a career focused on

achieving subjective success through autonomous career management” (DiRenzo et al., 2015, p. 538).

Regardless of the specific conceptualization of PCO, is it generally presumed that a PCO is closely related to behavioral and attitudinal variables (e.g., identity, self-efficacy, proactivity, locus of control, adaptability) that are considered critical in facilitating the development of a protean career (Hall, 2004; Waters et al., 2015). However, the specific conceptual and empirical relationships of such constructs with PCO have not been clearly identified in the literature. This presents major challenges and shortcoming in the protean career literature (Gubler et al., 2014). In this paper, we specifically focus on two variables that seem conceptually especially important in relation to PCO: Vocational identity clarity and occupational self-efficacy.

We conceptualize vocational identity clarity as representing the career meta-competency of identity in terms of self-awareness, as described by Hall (2004). We specifically adopt the personal identity perspective that is prevalent in the vocational literature. This approach sees identity as an individual’s clear and stable perception of his/her work-related interests, skills, and values (Holland, Johnston, & Asama, 1993). A protean career is presumed to require a high level of self-awareness concerning the personal values that guide career development (Hall, 2004). This clear awareness of one’s vocational identity can be seen as a meta-competency for developing a protean career because in times of frequent change and decreasing organizational guidelines for career development, people need a strong internal compass to guide and develop their careers (Hall, 1996). Existing empirical research has not directly investigated vocational identity clarity in relation to PCO, but it has confirmed that factors closely related to identity, such as career insight (De Vos & Soens, 2008), self-awareness (Verbruggen & Sels, 2008), career decidedness (Creed,

Macpherson, & Hood, 2011), and behaviors related to identity awareness in terms of self-exploration (Briscoe et al., 2012) were positively related to PCO.

In addition to identity clarity, a sense of self-efficacy is presumed to be critical to develop a protean career (Waters et al., 2015). Self-efficacy is a pivotal variable for human agency in general (Bandura, 2001) and career development processes and outcomes in particular (Betz, 2007) because it motivates people to take action and facilitates energy, effort, and persistence in goal pursuit (Bandura, 2001). Self-efficacy is also closely related to the meta-competency of adaptability that is deemed critical for a protean career because adaptability helps to adjust to new environments and should facilitate continuous learning (Hall, 2004; Waters et al., 2015). Adaptability is a multidimensional construct and has been conceptualized in different ways by different authors (Morrison & Hall, 2002; Rottinghaus, Buelow, Matyja, & Schneider, 2012; Savickas & Porfeli, 2012). However, across models, there is agreement that a sense of confidence is a key factor of adaptability (Hirschi, Herrmann, & Keller, 2015). While adaptability thus represents a much more general and ambiguous construct, by examining the more specific component of self-efficacy, our studies also allow drawing tentative conclusions about the relationship of PCO and the meta-competency of adaptability.

PCO is conceptually closely related to a sense of agency in career development because having a protean career implies proactively managing one's career without depending on an organization to be responsible for one's professional development (Hall, 2004). Empirical studies have shown that PCO is linked to proactive behaviour and a proactive disposition (i.e., proactivity; Creed et al., 2011; Herrmann et al., 2015), general adaptability (Verbruggen & Sels, 2008), diverse career self-management behaviours (De Vos & Soens, 2008), and career planning (DiRenzo et al., 2015), self-exploration, environmental

exploration, and self-regulation (Creed et al., 2011). However, to the best of our knowledge, no research has directly investigated the relationship between PCO and self-efficacy.

4.2 Study 1: The Temporal Precedence of PCO, Vocational identity Clarity, and Occupational Self-Efficacy

Previous studies have already established that PCO is significantly correlated with different career attitudes that are closely related to identity clarity and occupational self-efficacy, such as identity awareness (assessed in terms of career self-exploration) (Briscoe et al., 2012), career insights (De Vos & Soens, 2008), self-awareness (Verbruggen & Sels, 2008), career decidedness (Creed et al., 2011), psychological capital, or employability (DiRenzo et al., 2015). However, the reasons for such correlations have not been examined in more detail and different authors have made theoretically conflicting propositions. From a conceptual standpoint, some researchers have conceived of career attitudes such as identity and self-efficacy as enablers of a protean career and antecedents of PCO (Hall, 2002; Inkson, 2006; Waters et al., 2015). Others have suggested that these constructs might as well be a consequence of PCO rather than a precondition (Greenhaus, Callanan, & DiRenzo, 2008). Similarly, in empirical studies, some researchers (De Vos & Soens, 2008; DiRenzo et al., 2015) have argued that PCO will act as an antecedent to career self-management behaviors, career insights, psychological capital, or employability. Conversely, others (Creed et al., 2011; Verbruggen & Sels, 2008) have speculated that competencies for career management will act as antecedents of PCO. However, due to a reliance on cross-sectional designs or the lack of true longitudinal designs with several measurements of the same variables over time to assess lagged effects, none of these studies has been able to adequately address this issue empirically. Our study goes beyond previous findings by directly addressing this controversy and clarifying the temporal precedence linking PCO, vocational identity clarity, and occupational self-efficacy with a cross-lagged study across three measurement points. We

thereby make an important contribution to the literature in helping to clarify in what way PCO is related to other career attitudes.

We specifically assumed that the positive relationships among PCO, identity clarity, and self-efficacy could be explained due to reciprocal influences of the constructs over time. PCO could promote a sense of identity because having a protean career means having a learning orientation and being more actively engaged in the lifelong processes of identity change and adaptation (Hall, 2004). Because PCO refers to a values-driven approach to career development, people with a strong PCO could be expected to be more motivated to engage in identity reflection and clarification of personal values that help them directing their career (Briscoe et al., 2012), thereby enhancing their vocational identity clarity. Moreover, because PCO also includes a self-directed career approach, people with high PCO can be expected to engage more in activities such as collecting information about occupations or job opportunities and obtaining feedback on their career aspirations that can help to clarify their vocational identity. Hence, we propose:

Hypothesis 1a: PCO positively predicts vocational identity clarity.

On the other hand, possessing higher identity clarity should also facilitate the development of PCO. People with a clear sense of personal values, strengths, interests, and goals should be more inclined to pursue a values-driven career in order to implement their identity in the work role. Moreover, having a clear identity can stimulate a self-directed approach to career management because clear, self-congruent goals motivate action and personal initiative (Parker, Bindl, & Strauss, 2010). Also, people with a clear identity do not need to rely on other people or organizations to direct their careers because they know for themselves what they want to achieve and thus can take charge of their career in a self-directed manner. We thus propose:

Hypothesis 1b: Vocational identity clarity positively predicts PCO.

PCO should also enhance a sense of competence and agency in one's work and career development because it is related to better performance in one's job (Briscoe et al., 2012), more active coping with change (Briscoe et al., 2012), and an increased sense of employability (De Vos & Soens, 2008). Moreover, because people with a high PCO are self-directed and values-driven their career, they should create more opportunities to experience success, feel competent, and satisfied at work which can increase a sense of competence towards the work role (Hall, Mirvis, & Associates, 1996). Also, because people with high PCO self-direct their career, success experiences might be more readily attributed to personal effort and thereby enhance a sense of competence (Bandura, 2001). We propose:

Hypothesis 2a: PCO positively predicts occupational self-efficacy.

Likewise, a sense of competence concerning one's career should promote PCO because self-efficacy increases initiative, effort, and persistence in goal-directed behaviors (Bandura, 2001). It can thus enhance the motivation to take charge of one's career in a self-directed way. A sense of competence is thereby also closely related to subjective success and can trigger a "success cycle" in which positive career experiences enhance a self-directed career orientation (Hall et al., 1996). Moreover, people who feel competent to master challenges in the work role might be more ready to direct their career according to their own values instead of relying on an organization. We hence propose:

Hypothesis 2b: Occupational self-efficacy positively predicts PCO.

Based on H1 and H2, we thus assume the following:

Hypothesis 3: There are reciprocal effects over time between PCO and (a) vocational identity clarity and (b) occupational self-efficacy.

To test these hypotheses, we used a three-wave, cross-lagged longitudinal design. We chose to sample university students in this study because this group of emerging adults is actively concerned with career development and career preparation in order to master the

transition from the university to the workplace or to more specialized graduate degrees. At the same time, emerging adulthood is a period in which the development, clarification, and consolidation of personal interests, values, and life goals is particularly prevalent (Arnett, 2000). It thus provides an interesting career stage for investigating the development and temporal precedence of important career attitudes.

4.2.1 Method

Participants and procedure. We contacted 3,559 students across all majors at a German university by sending an email invitation containing a link to a web-based questionnaire, followed by reminder e-mails sent one and 2 weeks later to students who had not yet participated. As an incentive, participation in a lottery drawing was offered. This resulted in $n = 1,270$ participants (response rate 35.7%) who completed all three scales for this study; 61.6% female; age $M = 23.90$, $SD = 2.75$; and study semester $M = 4.11$, $SD = 2.35$. They represented 32 different majors, with the largest groups from management and entrepreneurship (19%), business administration (15%), and business psychology (12%). Participants were asked about their willingness to participate in follow-up surveys, and 900 (71%) indicated their interest. They were invited by email to complete an online questionnaire 6 months (T2) and 12 months (T3) later, with 416 (46%) participating at T1 and T2, 341 (38%) participating at T1 and T3, and 191 (21%) participating at all three measurement points. A 6-month period was selected because it corresponds with one university study semester and because, based on other research (e.g., Strauss, Griffin, & Parker, 2012) that used the same time lag to explore changes in career-related constructs, we expected the amount of time to be sufficient to capture meaningful change in our variables of interest. At each measurement point, a lottery drawing for five vouchers of EUR 60 each (approximately 65 USD) was offered as an incentive. PCO, identity, and self-efficacy were assessed at each measurement point.

We retained students for the subsequent analyses who had participated at T1 and at least one additional wave (T2 and/or T3). Missing data were estimated with maximum likelihood estimation with robust standard errors (MLR) in *Mplus*. Research has shown that the listwise deletion of participants can bias results (Graham, 2009); therefore, our chosen procedure avoided deleting participants who did not participate in each wave. The final sample ($n = 563$) was 66% female; age $M = 23.70$, $SD = 2.79$; and study semester $M = 3.73$, $SD = 2.14$. The participants were enrolled in 25 different majors, with management and entrepreneurship (20%), business psychology (14%), business administration (14%), and environmental sciences (7%) constituting the largest groups. T-tests confirmed that the participants who completed the survey only at T1 did not differ significantly from the participants who also participated in at least one follow-up assessment on any of the assessed measures at T1.

Measures. The Cronbach's alpha estimates, means, standard deviations, and correlations between measures are reported in Table 5.

Protean career orientation. We used the German-language adaptation (Herrmann et al., 2015) of the scale by Baruch (2014), which measures PCO as a one-dimensional construct with seven items (e.g., “*I am in charge of my own career*”) and a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Several studies (e.g., Baruch, 2014; Herrmann et al., 2015) have supported the scale's construct validity among employees and university students in terms of significant correlations with other measures of PCO, job satisfaction, career satisfaction, and proactive career behaviours.

Vocational identity clarity. We applied the German-language adaptation of the vocational identity scale (Holland, Daiger, & Power, 1980; Jörin, Stoll, Bergmann, & Eder, 2004) using seven inversely coded items (e.g., “*I'm not sure yet which occupations I could perform successfully*”) and a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5

Table 5: Study 1 - Means, Standards Deviations, Reliability, and Correlations

		<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
T 1	1. Protean career orientation	37.10	4.79	(.68)	.32	.47	.52	.28	.44	.57	.30	.41
	2. Vocational identity clarity	24.07	6.24		(.88)	.47	.27	.72	.41	.29	.70	.39
	3. Occupational self-efficacy	25.50	3.99			(.79)	.42	.46	.72	.40	.39	.63
T 2	4. Protean career orientation	37.82	4.85				(.71)	.39	.48	.63	.34	.47
	5. Vocational identity clarity	24.07	6.29					(.89)	.49	.31	.77	.45
	6. Occupational self-efficacy	25.71	3.95						(.80)	.46	.47	.71
T 3	7. Protean career orientation	36.61	4.96							(.72)	.41	.48
	8. Vocational identity clarity	23.73	6.44								(.89)	.54
	9. Occupational self-efficacy	25.71	4.30									(.84)

Note. The entries in parentheses on the diagonal are the Cronbach's alpha reliability coefficients; T1 correlations, *N* = 563; T2 correlations, *N* = 412; T3 correlations, *N* = 341; T1-T2 correlations, *N* = 412; T1-T3 correlations, *N* = 341; T2-T3 correlations, *N* = 190; all correlations are significant (*p* < .001).

(*strongly agree*). Research with the German-language version showed that the scale correlated significantly with measures of work engagement, perceived person-job fit, and career planning among German employees and university students (Hirschi, 2012; Hirschi & Herrmann, 2013). We inverted the item scoring prior to data analysis so that higher scores indicated higher identity clarity.

Occupational self-efficacy. We used the six-item (e.g., “*Whatever comes my way in my job, I can usually handle it*”) German short version of the occupational self-efficacy scale, as developed and validated by Rigotti, Schyns, and Mohr (2008), with a 6-point Likert scale ranging from 1 (*not at all true*) to 6 (*completely true*). Rigotti et al. (2008) provided evidence of construct validity among a large group of German employees with significant relationships with job satisfaction, organizational commitment, job performance, and job insecurity. Hirschi and Herrmann (2013) established significant correlations with career decidedness and proactive career behaviors among German university students.

Consideration of control variables. We considered gender, age, educational level (enrolled in bachelor or master level), and study major as potential control variables because previous research showed that these variables may be related to PCO (De Vos & Soens, 2008; Segers, Inceoglu, Vloeberghs, Bartram, & Henderickx, 2008). However, correlations between PCO and gender, age, and educational level were nonsignificant in our sample. PCO correlated negatively with majoring in business administration versus majoring in another subject ($r = .10, p < .05$), but vocational identity clarity or occupational self-efficacy were not related to any major. Because we did not find a clear pattern of correlations between the potential control variables and our focal variables of interest, we decided to report the results without including control variables to maximize power and offer more interpretable results (Bernerth & Aguinis, 2016).

4.2.2 Results and Discussion

To test H1, H2, and H3, which postulated mutual effects among PCO, vocational identity clarity, and occupational self-efficacy, we conducted cross-lagged analyses (CLA). Prior to model testing, we established measurement invariance over time among our measures. Measurement invariance ensures that the measures assess the same construct at different points in time concerning factor structure and item functioning. To proceed with the CLA, demonstrating at least scalar invariance was necessary. Scalar invariance is confirmed when equivalent factor structures and equal factor loadings are observed across time points. All scales either fulfilled or exceeded this minimum requirement, which confirmed the suitability of the scales for the subsequent CLA (for more details on the applied procedure see Lance, Vandenberg, & Self, 2000). To assess different cross-lagged models, we performed comparisons between a series of nested models (Table 6).

First, we tested the baseline model (Model 1) with only autoregressive, not cross-lagged, effects between each measurement occasion. The latent variables at measurement point T1 and the disturbances of the constructs at measurement points T2 and T3 were correlated. Model 1 showed a satisfactory fit with the data (Table 6). Next, we tested a model containing cross-lagged pathways from vocational identity clarity and occupational self-efficacy to PCO (Model 2). We first assessed cross-lagged paths with a 6-month time lag (Model 2a). Hence, the paths led from clarity and self-efficacy at T1 to PCO at T2 and from identity clarity and self-efficacy at T2 to PCO at T3. We also tested a model with a 1-year time lag (Model 2b), which contained cross-lagged effects from identity clarity and self-efficacy at T1 to PCO at T3. Next, we tested a model that contained effects from PCO to identity clarity and self-efficacy (Model 3). As shown above, we tested a model with time lags of 6 months (Model 3a), and 1 year (Model 3b). Finally, a fully cross-lagged model (Model 4) containing reciprocal effects between PCO and identity clarity and between PCO

Table 6: Study 1 - Model Fit Indices of Different Lagged Models

Model	Model description	$SB-\chi^2$	df	CFI	TLI	RMSEA [90% CI]	SRMR
1	Autoregressive	2726.73***	1729	.91	.91	.03-.03	.09
2	Identity > PCO and self-efficacy > PCO						
2a	6-month time lag	2719.60***	1725	.91	.91	.03-.03	.08
2b	1-year time lag	2719.99***	1727	.91	.91	.03-.03	.08
3	PCO > identity and PCO > self-efficacy						
3a	6-month time lag	2708.66***	1725	.92	.91	.03-.03	.08
3b	1-year time lag	2716.69***	1727	.92	.91	.03-.03	.08
4	Fully cross-lagged						
4a	6-month time lag	2703.21***	1721	.92	.91	.03-.03	.08
4b	1-year time lag	2710.34***	1725	.92	.91	.03-.03	.08

Note. $N = 563$; PCO: protean career orientation; identity: vocational identity clarity; self-efficacy: occupational self-efficacy

*** $p < .001$.

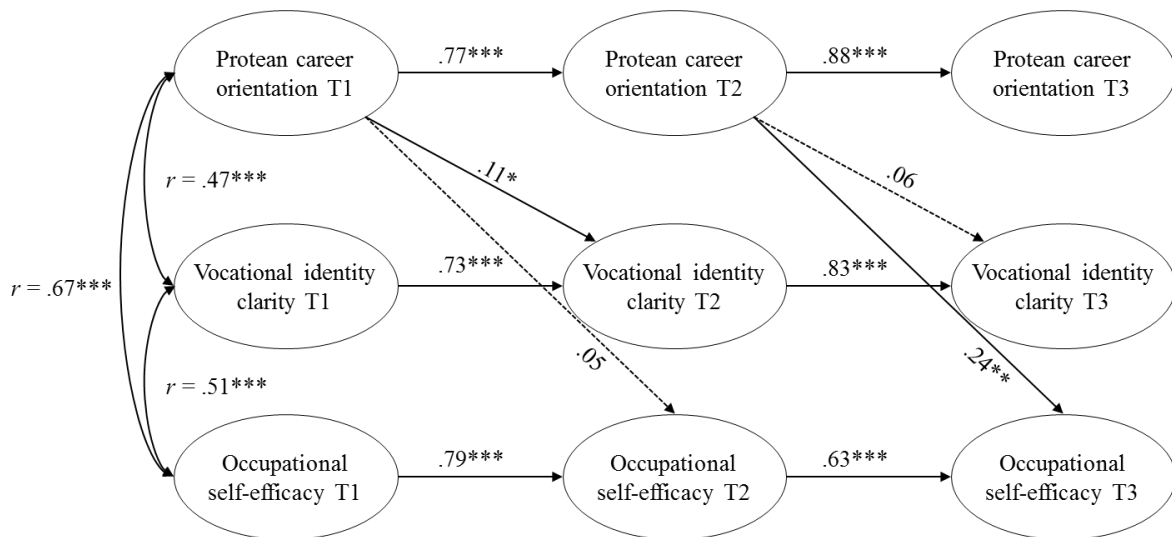
and self-efficacy was evaluated. Model 4a included a 6-month time lag, whereas Model 4b included a 1-year time lag.

Because the autoregressive model is nested within the other models, we then conducted *SB- χ^2* difference tests to compare whether the models containing cross-lagged effects provided a significantly better fit than more parsimonious models did. Between models with the 6-month time lag, Model 3a (effects from PCO to identity clarity and self-efficacy) provided a significantly ($p < .01$) better fit than did the autoregressive baseline Model 1, whereas Model 2a (effects from identity clarity and self-efficacy to PCO) did not show a better fit than baseline Model 1. This finding indicates that PCO had effects on identity clarity and self-efficacy but that identity clarity and self-efficacy did not have effects on PCO. Next, we compared the model fit of Model 3a with that of the fully cross-lagged Model 4a. The results indicated that the fully cross-lagged did not significantly improve the fit over Model 3a. The best-fitting model (3a) is shown in Figure 4. Significant paths led from PCO at T1 to identity clarity at T2 and from PCO at T2 to self-efficacy at T3.

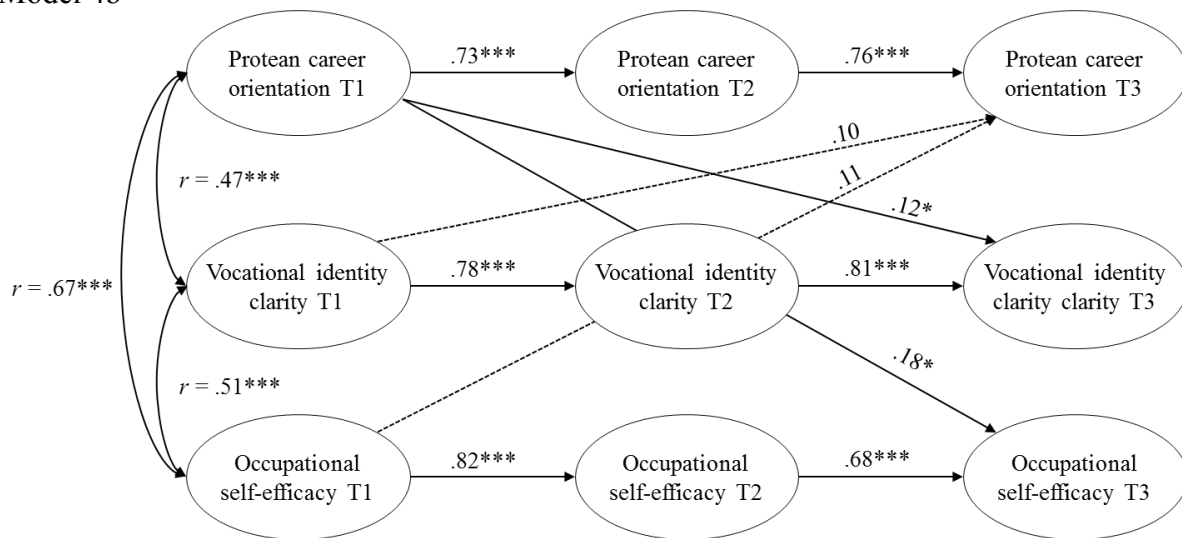
Among models with a 1-year time lag, the *SB- χ^2* difference tests showed that both lagged Models 2b ($p < .05$) and 3b ($p < .01$) displayed a significantly better fit than did baseline Model 1. The subsequent comparison showed that model fit improved significantly in the fully cross-lagged Model 4b (shown in Figure 4) over Models 2b ($p < .01$) and 3b ($p < .05$), which indicated reciprocal effects between PCO and identity clarity and self-efficacy. However, significant paths were only found leading from PCO at T1 to identity clarity and self-efficacy at T3; significant paths from identity clarity or self-efficacy to PCO were not found. To test the stability of our results, we also conducted the same analyses with the 1-year time-lag models and a more restricted sample consisting only of participants who completed the survey at T1 and T3 ($n = 341$). The results did not meaningfully change compared with the findings obtained from the larger sample.

Figure 4: Best-fitting models (Study 1; N = 563): Model 3a with a 6-month time lag (above) and Model 4b with a 12-month time lag (below).

Model 3a



Model 4b



Note. Solid paths indicate significant effects and dashed paths indicate nonsignificant effects. The correlations between the three constructs at T2 and T3 were significant at $p < .001$, but they are not shown. Each latent construct is represented by the respective items on the scale (not shown in figure). * $p < .05$; ** $p < .01$; *** $p < .001$.

In summary, our results obtained with both 6-month and 1-year time lags suggest that PCO predicts vocational identity clarity and occupational self-efficacy. However, we did not

find clear support for effects in the other direction (i.e., identity and self-efficacy on PCO), which supports H1a and H2a but refutes H1b, H2b, and H3.

4.3 Study 2: The Indirect Effects of PCO on Proactive Career Behaviours, Job

Satisfaction, and Career Satisfaction

Based on the findings from Study 1, that is, that PCO temporarily precedes changes in vocational identity clarity and occupational self-efficacy, the second study aimed to investigate whether the effects of PCO on important career outcomes were partially mediated by identity clarity and self-efficacy. This investigation helps to better understand the functioning of PCO in relation with identity clarity and self-efficacy. In addition, this study makes a more general contribution to the literature by addressing the important and contested questions of (a) *why* PCO can result in positive career outcomes and (b) the incremental utility of PCO beyond closely related and established career attitudes in explaining career outcomes (Gubler et al., 2014). In an attempt to advance existing research on this issue, we specifically explored the outcomes of engagement in proactive career behaviors, job satisfaction, and career satisfaction.

PCO is generally assumed to predict proactive career behaviours such as career planning, exploration, or networking. This is because PCO implies a desire to self-direct one's career according to one's own values and goals (Hall, 2004). People with high PCO have a self-directed approach to career development and they should thus be more inclined to proactively engage diverse career behaviours in order to realize their career goals such as positioning behaviours, networking, career planning, and collecting information about job opportunities. Moreover, people with high PCO are presumed to be learning orientated (Hall, 2004), which should also promote more active engagement in career behaviours that help to expand knowledge and networks such as career exploration and networking. Finally, because PCO entails a values-driven approach to career development, PCO should be positively

related to proactive career behaviours in terms of identity reflection and self-exploration in order to clarify the values that should direct the career. In support of this premise, previous research has found positive relationships between PCO and different career management behaviours, including increased career planning, identity exploration, and job search activities (Briscoe et al., 2012; Creed et al., 2011; De Vos & Soens, 2008; DiRenzo et al., 2015; Herrmann et al., 2015; Waters et al., 2014; Waters et al., 2015).

PCO is also postulated to be a facilitator to achieve subjective career success. This is because people with high PCO are assumed to know what they want from their careers and have the adaptability and self-awareness to achieve their subjectively aspired career values (Waters et al., 2015). Hence, high PCO should be positively related to being self-directed and taking personal initiative to achieve personally valued career goals. Moreover, because people with high PCO are values driven, they should more likely achieve career goals that correspond to their values and thereby achieve success according to their own standards (Hall, 2004). Empirical research (e.g., Baruch, 2014; Baruch et al., 2014; Briscoe et al., 2012; De Vos & Soens, 2008; Herrmann et al., 2015; Park, 2009; Verbruggen & Sels, 2008; Volmer & Spurk, 2011) broadly supports a positive correlation between PCO and career satisfaction.

Considerably fewer studies have examined the relationship between PCO and job satisfaction. Most studies report a positive relationship (Baruch, Humbert, & Wilson, 2016; Baruch, Wordsworth, Mills, & Wright, 2016; Cerdin & Le Pargneux, 2014) but some also found that PCO predicted a decline in job satisfaction over time (Supeli & Creed, 2016). In contrast to career satisfaction, job satisfaction refers to the current work experience and not an overall assessment of one's working experiences over one's entire career. However, it is plausible that PCO is generally positively related to job satisfaction because people with high PCO are values-driven and thus more likely to select jobs that correspond to their values and thereby experience a better person-job fit. Moreover, because they are self-directed, they

might more likely obtain their aspired jobs by being more active in networking or job search. Also, because of their self-directedness, people with high PCO might more likely quit an unsatisfying job in favour of a more satisfying one instead of staying passively stuck in an unsatisfying position.

However, the reasons for the observed generally positive association between PCO, proactive career behaviours, and satisfaction with job and career remain underexamined. For example, while a high PCO might generally facilitate positive career outcomes, it needs to be further established by what processes this occurs. Such knowledge is important to better understand why PCO can have positive effects for career development. Previous cross-sectional studies have examined several variables as possible mediators linking PCO with career satisfaction, including identity awareness and active coping (Briscoe et al., 2012), career self-management behaviors and career insights (De Vos & Soens, 2008), professional vitality (Baruch et al., 2014), and organizational commitment and employees' met expectations (Grimland, Vigoda-Gadot, & Baruch, 2012). In addition, DiRenzo et al. (2015) examined career planning, human capital, social capital, and psychological capital as mediators between PCO and employability in a longitudinal study. However, more research is needed that goes beyond these mediators and outcomes to provide a more comprehensive examination of why and how PCO is related to different career outcomes and to what extent PCO has unique validity in explaining outcomes beyond other related constructs (Gubler et al., 2014; Waters et al., 2015). In the present study, we extend previous studies and proposed that increased vocational identity clarity and occupational self-efficacy can partially explain the relationships among PCO and proactive career behaviours, job satisfaction, and career satisfaction and investigated this claim in a longitudinal study.

Regarding the outcome of proactive career behaviours, a clear vocational identity provides purpose and direction in one's career. It should thus promote taking charge of one's

career by means of proactive career behaviours (Hirschi, Lee, Porfeli, & Vondracek, 2013). This is in accordance with goal setting research showing that clear and self-congruent goals lead to more effort and persistence in goal pursuit (Locke & Latham, 2002). Likewise, self-efficacy represents an important source of proactive motivation and human agency (Bandura, 2001). Many studies have confirmed that a sense of efficacy promotes action and persistence in goal pursuit (Locke & Latham, 2002). We can hence expect that occupational self-efficacy facilitates the engagement in proactive career behaviors. Empirical studies have confirmed a positive relationship between vocational identity and occupational self-efficacy and career management behaviours (Hirschi et al., 2013; Rogers & Creed, 2011). Based on the findings from Study 1 regarding the positive predictive relationships between PCO and vocational identity clarity and occupational self-efficacy, we thus proposed the following:

Hypothesis 1: There is a positive indirect effect of PCO on proactive career behaviours through (a) higher vocational identity clarity and (b) stronger occupational self-efficacy.

Regarding the outcomes of job and career satisfaction, a clear identity should help a person focus on his/her interests, work preferences, and skills, thus potentially enhancing the likelihood of success in one's job or career. The perception of success and the ability to utilize one's skills and perform work in accordance with one's core values and interests can thus increase a person's satisfaction with his/her job and career progress. Moreover, a feeling of efficacy concerning workplace and career challenges should increase a person's satisfaction with his/her job and career because a sense of competence and control are crucial for satisfaction and well-being (Ryan & Deci, 2001). Also, based on goal setting theory research (Locke & Latham, 2002), we can expect that identity clarity and self-efficacy make the attainment of goals more likely because they promote increased effort and persistence in goal pursuit. Goal achievement is in turn a precursor to satisfaction (Locke & Latham, 2002). In

support of this premise, empirical studies have confirmed that vocational identity clarity and occupational self-efficacy are positively related to job and career satisfaction (Abele & Spurk, 2009; Goldman, Masterson, Locke, Groth, & Jensen, 2002; Rigotti et al., 2008).

Hypothesis 2: There is a positive indirect effect of PCO on job satisfaction through (a) higher vocational identity clarity and (b) stronger occupational self-efficacy.

Hypothesis 3: There is a positive indirect effect of PCO on career satisfaction through (a) higher vocational identity clarity and (b) stronger occupational self-efficacy.

Finally, we wanted to explore if PCO predicts career outcomes beyond the career attitudes of identity clarity and self-efficacy. Based on the results of Study 1, which confirmed that PCO, vocational identity clarity, and occupational self-efficacy are moderately correlated, we expected that PCO would make a unique contribution to explain variance in career outcomes and that its effects would only be partially mediated by identity clarity and self-efficacy.

Hypothesis 4: PCO explains unique variance in (a) proactive career behaviours, (b) job satisfaction, and (c) career satisfaction beyond vocational identity clarity and occupational self-efficacy.

4.3.1 Method

Participants and procedure. We contacted university alumni ($N = 1,490$) by sending an email invitation containing a link to an online questionnaire, followed by one reminder email a week later; we achieved a final response rate of 39%, $n = 581$. The participants were invited again 6 months later, resulting in a final sample of $n = 202$ participants who completed the questionnaires on both measurement occasions (35% follow-up response rate); 55% female; and age $M = 30.67$; $SD = 6.37$; 25% had a bachelor's degree, 68% had a Master's degree, and 5% had a doctoral degree. They worked in a wide range of industry sectors, with 21% in engineering, 15% in business management, 15% in education, and 8% in computer

science. The measures of PCO, vocational identity clarity, and occupational self-efficacy were assessed at T1. The outcome measures for engagement in proactive career behaviors, job satisfaction, and career satisfaction were assessed at T2.

Measures. The measures of *PCO*, *vocational identity clarity*, and *occupational self-efficacy* were the same as those in Study 1. All applied scales used a 5-point Likert scale response format. Table 7 shows the Cronbach's alpha estimates, means, standard deviations, and correlations between all measures.

Proactive career behaviors. We used the nine-item German career engagement scale (Hirschi, Freund, & Herrmann, 2014) to assess the extent to which someone had been engaged in a range of career management behaviors over the last 6 months (e.g., career planning, self-exploration and environmental exploration, networking, positioning behaviour, and voluntary training; “*Over the past 6 months, to what extent have you undertaken things to achieve your career goals?*”). Previous research that had used the scale provided support for its construct validity, showing significant positive relationships with career decidedness, career exploration, networking, and job satisfaction among different samples (Hirschi et al., 2014).

Job satisfaction. The respondents indicated their satisfaction with their current job with seven German-language items (Neuberger & Allerbeck, 1978) that tapped into working conditions, possibilities for professional advancement, organizational leadership, work colleagues, work content, supervisors, and income (e.g., “*How satisfied are you with the organizational leadership in your organization?*”).

Career satisfaction. We used a German translation (Abele & Spurk, 2009) of the career satisfaction scale designed by Greenhaus, Parasuraman, and Wormley (1990). The scale consists of five items (e.g., “*I am satisfied with the progress I have made towards meeting my overall career goals*”). Abele and Spurk (2009) report support for the scale's

Table 7: Study 2 - Means, Standards Deviations, Reliability, and Correlations

		<i>M</i>	<i>SD</i>	1	2	3	4	5	6
T 1	1. Protean career orientation	37.88	5.84	(.76)	.20*	.46***	.29**	.18*	.23**
	2. Vocational identity	27.10	6.46		(.91)	.47***	.19*	.24*	.36***
	3. Occupational self-efficacy	27.51	4.30			(.86)	.25**	.24*	.38***
T 2	4. Proactive career behaviours	30.56	7.86				(.89)	.24**	.16*
	5. Job satisfaction	34.69	6.22					(.81)	.65***
	6. Career satisfaction	18.55	3.67						(.84)

Note. *N* = 202; the entries in parentheses on the diagonal are the Cronbach's alpha reliability coefficients; * *p* < .05; ** *p* < .01; *** *p* < .001.

unidimensionality and construct validity in terms of significant correlations with salary and occupational status among employees in Germany.

Consideration of control variables. We considered gender, age, educational level, industries, and job tenure as control variables. However, bivariate correlations revealed that none of the control variables showed significant correlations with PCO. We therefore decided to report the results without including control variables to maximize power and offer more interpretable results (Bernerth & Aguinis, 2016).

4.3.2 Results and Discussion

The correlations between the assessed constructs were significant and moderate to high (Table 7). Replicating the findings from Study 1, PCO correlated positively and moderately with vocational identity clarity and occupational self-efficacy. In addition, PCO significantly correlated with all the criterion variables assessed at T2: proactive career behaviors, job satisfaction, and career satisfaction. To test the proposed multiple-mediation model (H1, H2, and H3), we conducted a multiple-mediation analysis with a bootstrapping approach in *Mplus*, as described by Preacher and Hayes (2008); we used 5,000 bootstrapping samples. To account for shared variance among the three criterion variables and to avoid an inflated Type I error due to several separate analyses, we included all three criterion variables in one model, allowing them to correlate freely.

Table 8 shows the point estimates and 95% confidence intervals for each indirect effect. An indirect effect of PCO (through vocational identity and occupational self-efficacy) on proactive career behaviors could not be confirmed, which refuted H1. However, a significant specific direct effect of PCO on proactive career behaviors was found, confirming the unique effect of PCO on the outcome beyond vocational identity clarity and occupational self-efficacy. There were no significant specific direct, indirect, or total indirect effects of PCO on job satisfaction, which refuted H2. Finally, the results showed significant indirect effects of PCO on career satisfaction through vocational identity clarity and occupational self-

efficacy, which supported H3a and H3b. Examining the pairwise contrasts of vocational identity clarity and occupational self-efficacy showed no significant difference between the indirect effects. We did not find a specific direct effect between PCO and career satisfaction, once the effects of vocational identity clarity and occupational self-efficacy were considered. Regarding H4, the results indicate that PCO explains unique variance only in proactive career behaviors but not in job satisfaction or career satisfaction beyond vocational identity clarity and occupational self-efficacy, supporting H4a but refuting H4b and H4c.

4.4 General Discussion

Although the notion of protean careers has become widespread in recent years, there is still a need for further theoretical and empirical refinement to respond to recent criticism in the literature on *new careers*, including claims about the lack of rigorous empirical evaluation of new constructs (Rodrigues & Guest, 2010). As such, we addressed some of the major challenges involved in introducing new constructs (e.g., PCO) into the literature: establishing and clarifying the construct's relationship to existing constructs and examining questions of its distinctness, temporal precedence in relation to other constructs, predictive incremental validity, and underlying mechanisms of functioning.

The notion of the protean career is closely intertwined with other constructs such as identity, self-efficacy, proactivity, locus of control, or adaptability (Gubler et al., 2014; Hall, 2004; Waters et al., 2014). However, also due to inconsistent conceptualizations of PCO in the literature, how PCO relates to such constructs has been theoretically ambiguous and inadequately empirically tested.

Table 8: Study 2 - Direct and Indirect Effects of Protean Career Orientation on Proactive Career Behaviors, Job Satisfaction, and Career Satisfaction Mediated by Vocational Identity Clarity and Occupational Self-Efficacy

	Point estimate	Product of coefficients		BC 95% CI	
		SE	p	Lower	Upper
<i>Proactive career behaviors</i>					
Specific direct effects					
PCO > career behaviors	0.32	0.15	0.03	0.05	0.63 [†]
Identity > career behaviors	0.12	0.11	0.31	-0.10	0.34
Self-efficacy > career behaviors	0.17	0.23	0.46	-0.27	0.61
Specific indirect effects					
Through identity	0.03	0.03	0.40	-0.02	0.11
Through self-efficacy	0.06	0.08	0.48	-0.10	0.22
Total indirect effect	0.08	0.07	0.25	-0.05	0.23
<i>Job satisfaction</i>					
Specific direct effect					
PCO > job satisfaction	0.09	0.11	0.39	-0.12	0.31
Identity > job satisfaction	0.16	0.11	0.14	-0.07	0.36
Self-efficacy -> job satisfaction	0.18	0.18	0.32	-0.20	0.52
Specific indirect effects					
Vocational identity	0.04	0.03	0.25	-0.01	0.11
Occupational self-efficacy	0.06	0.07	0.34	-0.07	0.19
Total indirect effect	0.10	0.06	0.12	-0.02	0.23

Table 8 (Continued)

	Point estimate	Product of coefficients		BC 95% CI	
		<i>SE</i>	<i>p</i>	Lower	Upper
<i>Career satisfaction</i>					
Specific direct effect					
PCO > career satisfaction	0.09	0.11	0.52	-0.07	0.20
Identity > career satisfaction	0.13	0.11	0.03	0.01	0.25 [†]
Self-efficacy > career satisfaction	0.20	0.10	0.05	0.01	0.41 [†]
Specific indirect effects					
Vocational identity	0.03	0.02	0.13	0.00	0.08 [†]
Occupational self-efficacy	0.07	0.04	0.06	0.01	0.16 [†]
Total indirect effect	0.10	0.04	0.01	0.04	0.18 [†]

Note. $N = 202$; *PCO* = Protean career orientations; *BC* = bias corrected; bootstrap samples = 5,000. [†] 95% CI does not include zero.

Our results shed new light on this issue by specifically investigating the theoretical and empirical relationship between PCO and two related key constructs: Vocational identity clarity and occupational self-efficacy. Both our studies support theoretical analyses (Greenhaus et al., 2008; Gubler et al., 2014; Inkson, 2006) that these constructs are not features of PCO because they are only moderately correlated. Our finding implies that a person with a PCO does not necessarily—albeit is more likely to—have a clear vision of where he/she wants to proceed in his/her career (i.e., high vocational identity clarity) or possess a strong sense of agency concerning his/her ability to manage work- and career-related challenges (i.e., strong occupational self-efficacy). Future research could more closely

investigate the characteristics that distinguish people who combine PCO with identity clarity and self-efficacy from those who have a strong PCO but lack the latter two attributes.

Study 1 specifically addressed the controversy in the existing literature whether PCO is a correlate, outcome, or predictor of important career attitudes (Greenhaus et al., 2008; Gubler et al., 2014). Investigating the development of PCO in relation to two pivotal career attitudes (i.e., identity clarity and self-efficacy) with a cross-lagged design, our study makes an important and unique contribution to the literature that goes beyond reporting significant relationships between PCO and career attitudes. Specifically, our study allowed to examine the currently insufficiently addressed question of temporal precedence linking PCO and closely related constructs. For this purpose, we sampled university students who were in a developmentally critical period, in which personality traits, work values, and occupational interests are becoming stabilized and crystalized (Arnett, 2000). As our study suggests, the significant relationship between PCO and vocational identity clarity and self-efficacy can be explained by how PCO temporarily predicts the other two constructs. However, we could not confirm that identity and self-efficacy also prospectively predict PCO. Our results hence support the view that PCO acts as a facilitator in developing other career attitudes, rather than the other way around. Because vocational identity clarity and occupational self-efficacy are closely related to the meta-competencies of identity and adaptability, our study also provides important insights into the hitherto contested relationship between PCO and these two meta-competencies (Gubler et al., 2014). Our results would suggest that PCO is more likely an enabler than a consequence of career meta-competencies.

Our results specifically imply that PCO surfaces early among non-working students and that this orientation, in turn, contributes to the development of other career attitudes during the college years. Our results imply that the desire to self-direct a career to pursue subjective success (i.e., PCO) motivates students to clarify their personal skills, preferences, and interests in the career domain, which eventually increases their vocational identity clarity.

This finding supports those of Briscoe et al. (2012) about the positive correlation between PCO and identity clarity behaviours (i.e., career self-exploration). Our study advances these findings by using a different conceptualization of identity clarity and by linking PCO to identity clarity using a cross-lagged design. Moreover, PCO seems to enhance one's feeling of confidence in mastering work-related challenges. This finding might be explained by the relationship between PCO and more active coping with change (Briscoe et al., 2012) and an increased sense of employability (De Vos & Soens, 2008). Another possibility is that students with stronger PCOs develop more self-congruent and autonomous career goals. Such an intrinsic goal orientation could then enhance feelings of competence and self-esteem (Vonk & Smit, 2012). Apart from empirical investigations into such underlying mechanisms, future research is needed to more closely investigate how PCO emerges and which factors contribute to its development, possibly even before students attend college.

A longitudinal study among young professionals, Study 2 further enhanced our understanding of the combined and incremental effects of PCO, vocational identity clarity, and occupational self-efficacy in the working context. As such, this study makes a contribution to the still contested questions regarding by which processes a PCO can lead to positive career outcomes and the extent to which PCO can explain career outcomes beyond related and established constructs (Gubler et al., 2014).

Our study showed that identity and self-efficacy mediate some, though not all, of the effects of PCO on important career outcomes. Specifically, we confirmed the importance of PCO as a predictor of proactive career behaviours, as has been found with a different sample of employees in Germany (Herrmann et al., 2015). Given the increased importance of proactivity in the current work and career context (Thomas, Whitman, & Viswesvaran, 2010), this is an important finding that supports the relevance of PCO in the current career environment. Importantly, our results go beyond previous findings and show that PCO has incremental predictive utility for career behaviors, independent of vocational identity clarity

and occupational self-efficacy. This finding provides support for the additional value of investigating PCO above career attitudes that have already been established.

The finding also suggests that mechanisms other than increased identity clarity and self-efficacy might be at work in explaining why PCO motivates employees to be more proactive in their career development. We assume that the development of self-congruent goals can also play an important role here because research has shown that goal self-congruence is linked to engagement in proactive career behaviours (Hirschi et al., 2013). It is moreover possible that proactive career behaviours are not (just) an outcome but also a predictor of vocational identity clarity and occupational self-efficacy. For example, proactive behaviours such as self-reflection and career exploration or increasing knowledge and networks could enhance identity clarity and self-efficacy. Future research should assess mutual effects between proactive career behaviors and career attitudes to shed more light on this issue.

One of the most frequent career outcomes theoretically and empirically associated with PCO is subjective career success (De Vos & Soens, 2008; Hall et al., 1996). Our study confirms previous research (e.g., Briscoe et al., 2012; De Vos & Soens, 2008; Park, 2009) indicating that PCO is positively related to career satisfaction. However, our results go beyond extant studies and more closely indicate how this relationship can be explained. As shown, the effect of PCO on career satisfaction is fully mediated by increased vocational identity clarity and occupational self-efficacy. This finding helps explain why PCO leads to subjective career success and generally enriches our theoretical understanding of why specific career orientations potentially promote subjective success (Rodrigues, Guest, & Budjanovcanin, 2013). As our study implies, an enhanced sense of identity clarity and self-efficacy might be critical in this regard. Of course, these findings do not imply that identity clarity and self-efficacy are the only important mediators. One additional possible reason that PCO is related to subjective career success is that an orientation toward self-direction and

subjective career success enhances one's likelihood of using core personal strengths at work, which leads to a more positive evaluation of one's career experiences (Harzer & Ruch, 2012). Future research investigating such possibilities and other mediating mechanisms is warranted.

Finally, in line with previous studies (e.g., Baruch, 2014; Herrmann et al., 2015), we found a significant correlation between PCO and job satisfaction. However, we did not find support for our assumption that the effects of PCO on job satisfaction are mediated by vocational identity clarity and occupational self-efficacy. Extending previous studies, our results show that the specific direct and indirect effects of PCO on job satisfaction are not significant when vocational identity and self-efficacy are considered. This finding has important implications to better understand how PCO might be differently related to job vs. career satisfaction. Our results suggest that the positive effects of PCO on job satisfaction might be more indirect and largely due to the relationships of PCO with other variables. Because job satisfaction refers to the current working experience, job satisfaction is strongly influenced by diverse factors such as work context and person-job fit, in addition to career attitudes and orientations. This necessarily limits the potential direct effect of PCO on job satisfaction.

In contrast, our results suggest that PCO seems to exert stronger direct effects on the general evaluation of one's career than on the evaluation of one's current job. This is likely because career satisfaction is based on a more global evaluation of working experiences over time and is less dependent on specific, current situational factors. As such, due to criterion fidelity, the attitudinal variable of PCO is likely to have a stronger direct effect on a global career evaluation than on a specific job evaluation.

More research is now needed concerning whether, how, and why PCO may be important in explaining attitudinal organizational variables such as job satisfaction, turnover intentions, or work engagement. Future research could specifically address the boundary conditions *when* PCO is more or less likely to result in favourable career outcomes. Such

studies could help to better understand under what circumstances people with a high PCO might *not* be able to realize its generally beneficial effects, for example, why an employee with high PCO might fail to realize his or her aspired career values.

4.4.1 Limitations and Future Research

First, our studies are somewhat limited because we relied exclusively on self-reported data. The applied longitudinal assessments significantly diminish the possibility of common method bias. However, investigating the relationships of PCO to archival (e.g., promotions, turnover) and other-referred (e.g., job performance) outcome measures could be informative and enrich our understanding of the functioning of this career orientation. Second, the cross-lagged effects found in Study 1 suggest that PCO temporarily precedes vocational identity clarity and self-efficacy. However, the effects were relatively small and not entirely consistent across different time lags, possibly because the investigated constructs showed relatively high temporal stability over the assessed time span. Although we intentionally sampled a group in which changes in career attitudes are highly likely (i.e., emerging adults at college), obtaining large effects concerning changes and influences among career attitudes seems difficult. The student sample also limits the generalizability of the results to working populations. Moreover, it is possible that the obtained results are spurious because of the fact that the assessed student sample lacked significant work experience. Work experience in general and major work transitions in particular (e.g., from unemployment to reemployment; Waters et al. 2014) may potentially provide a context that leads to different development patterns of PCO, identity clarity, and self-efficacy from those observed in our study of university students.

Future research might also examine how more stable factors (e.g., personality traits, social environment, and family background) might affect career orientations and attitudes and investigate potential changes and effects over several years. Moreover, even with a cross-lagged design, no strict causal inferences are possible because the observed variables are not truly endogenous and because the factors that influence their relationship might be missing

from the model. Experimental approaches will be needed, for example, by systematically changing PCO, identity clarity, and/or self-efficacy through career interventions, to provide a true test of causality (Antonakis, Bendahan, Jacquart, & Lalive, 2010).

Also, more research is needed concerning other variables that might explain the functioning of PCO in relation to important career and organizational outcomes. Specifically, intrinsic and self-congruent goals, work adaptability, or job crafting might be important. Finally, our study explored PCO from a unitary approach. Future research needs to determine if different effects can be observed when distinguishing between the self-directed and values-driven career attitudes that underlie a PCO.

4.4.2 Practice Implications and Conclusion

Despite these limitations and open research questions, the present studies provided important new insights into how PCO is related to other pivotal career attitudes and how and why it is related to critical career outcomes. We could show that students and employees who hold the conviction that they are autonomously managing their career in order to achieve subjective success (i.e., hold a PCO) show increased vocational identity clarity and occupational self-efficacy. Moreover, identity clarity and self-efficacy are mechanisms through which a PCO is related to increased career satisfaction and proactive career behaviours. Our studies thus help clarify some of the conceptual disparity regarding the nature of PCO and its correlates, antecedents, and outcomes. As the presented studies suggest, PCO should be regarded as closely related to, though conceptually distinct from, the related constructs of identity clarity and self-efficacy. PCO seems to enable these attitudes, which helps explain some of its effects on career outcomes. We believe that these insights will considerably enrich future theoretical and empirical research on career development and career success in general and the protean career in particular.

For practice, there are no evaluation studies to our knowledge of interventions that could effectively change a PCO. Hence, for practitioners working as career counsellors or

human resource professionals, our studies suggests that it would be fruitful to more directly focusing on increasing vocational identity clarity and occupational self-efficacy, as these two attitudes act as proximal mediators of the positive effects of a PCO, according to our studies. Such interventions could include self-reflections about interests, values, and career preferences to augment identity clarity. To increase self-efficacy, planning and monitoring skill-enhancing learning experiences, providing role models and mentors, and identifying resources and past success experiences could be suitable intervention components.

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5 Narcissism and Career Success: Occupational Self-Efficacy and Career Engagement as Mediators

Abstract

Narcissism is a personality trait that has potentially important effects on career development outcomes, yet empirical research on this issue is sparse. The present study explored the relationships between narcissism and two indicators of career success (i.e., salary and career satisfaction) among a group of young professionals ($N = 314$). We assessed a model proposing that the effect of narcissism on career success is mediated by increased occupational self-efficacy beliefs and career engagement. While correlations between narcissism and the two indicators of career success were minimal, the results showed a significant indirect effect on salary via occupational self-efficacy and indirect effects on career satisfaction via self-efficacy and career engagement. We discuss the results regarding insights into why narcissism may lead to career success.

Keywords: narcissism; career success; occupational self-efficacy; career engagement

5.1 Introduction

Narcissism, in the social-personality view, is a normally distributed trait characterized by a sense of grandiosity, self-love, and inflated self-view (Foster & Campbell, 2007). Recently, researcher became interested to investigate to what extent “dark personality” traits such as narcissism might be related to work and organizational outcomes, for example, in relation to leadership and job performance (Campbell, Hoffman, Campbell, & Marchisio, 2011; O'Boyle, Forsyth, Banks, & McDaniel, 2012). While dark personality traits are usually related to a range of negative outcomes, particularly in interpersonal relationships (O'Boyle et al., 2012), little empirical research exists regarding the relationship between narcissism and work-related behaviors and outcomes. Existing research in this regard is mixed with evidence of positive, negative or no effects across different outcomes (O'Boyle et al., 2012). Moreover, to our knowledge, there is no research regarding the relationship between narcissism and career success. It also remains unclear by which processes narcissism and career success might be related. Addressing these questions would be important to better understand how narcissism might affect career development processes and outcomes. The present study explores the relationships between narcissism and two of the most commonly reported indicators of career success that represent both its objective and subjective dimensions (Ng, Eby, Sorensen, & Feldman, 2005): salary and career satisfaction. Specifically, we examined a model in which the effects of narcissism on career success are mediated by increased occupational self-efficacy beliefs and more engagement in proactive career behaviors. The results enhance our understanding of how and why narcissism is related to career success and contribute to the literatures on narcissism and career development.

5.1.1 Narcissism and Salary

Because people high in narcissism are good at impression management and have a sense of high self-worth, they should make better first impressions in selection contexts and in groups (Campbell et al., 2011). As a consequence, they should be more likely to get the job

that they want. In addition, people high in narcissism are motivated to strive for personal goals and have a desire to self-promote and engage in attention-seeking behaviors (O'Boyle et al., 2012). As such, they might be more inclined to apply career strategies such as positioning behaviors, influence behaviors, and positive self-presentation that are deemed to be important for career success (King, 2004; Kuijpers & Scheerens, 2006). Even though there seems to be no strong relationship between narcissism and job performance ratings (O'Boyle et al., 2012), these behaviors might help high-narcissistic people to self-promote their way into leadership positions (Brunell et al., 2008). As these aspects should be related to higher obtained salaries, we propose:

Hypothesis 1: Narcissism is positively correlated with salary.

5.1.2 Narcissism and Career Satisfaction

Research showed that narcissism is generally slightly negatively related to job satisfaction (Bruk-Lee, Khoury, Nixon, Goh, & Spector, 2009) possibly because employees high in narcissism think that they deserve a better job than they actually possess (Mathieu, 2013). Career satisfaction differs from job satisfaction as the former refers to the evaluation of one's entire working career (Greenhaus, Parasuraman, & Wormley, 1990). Due to the processes described above, people with high narcissism can be assumed to more likely obtain the jobs and promotions that they desire. Moreover, because people high in narcissism have high levels of self-appraisal, they should evaluate their own accomplishments positively (O'Boyle et al., 2012). As a consequence, we propose that they should more favorably evaluate their career progress:

Hypothesis 2: Narcissism is positively correlated with career satisfaction.

5.1.3 Occupational Self-efficacy Beliefs and Career Engagement as Mediators

To explain why the effects of narcissism on career success might occur, we draw upon current career development research and theory (Sullivan & Baruch, 2009) that has emphasized self-directedness and human agency as the main drivers of career success.

Specifically, we focused on two pivotal factors as mediators in this regard: occupational self-efficacy beliefs and engagement in career management behaviors.

Narcissism and occupational self-efficacy beliefs. Occupational self-efficacy refers to the belief that one is capable of mastering the tasks and challenges in one's work (Rigotti, Schyns, & Mohr, 2008). Self-efficacy beliefs are regarded as one key factor for positive career development and empirical research showed that self-efficacy beliefs are positively related to objective and subjective career success (Abele & Spurk, 2009). Because people high in narcissism have an inflated self-view and are overconfident, it is not surprising to find a positive relationship between narcissism and generalized self-efficacy beliefs (Mathieu & St-Jean, 2013). Therefore, high scores in narcissism may also be related to higher occupational self-efficacy beliefs.

Hypothesis 3: Narcissism is positively related to occupational self-efficacy beliefs.

According to social-cognitive career theory (Lent, Brown, & Hackett, 1994), more distal factors (e.g., personality traits) exert their effects on career outcomes via more proximal career attitudes and behaviors. Thus, we hypothesize that occupational self-efficacy beliefs mediate the effects of narcissism on career success:

Hypothesis 4: There is an indirect effect of narcissism on (a) salary and (b) career satisfaction through increased occupational self-efficacy beliefs.

Narcissism and engagement in proactive career behaviors. Engagement in proactive career behaviors (i.e., career engagement) is a critical behavioral variable related to career development. Studies have shown that proactivity is positively related to indicators of objective and subjective career success (Fuller & Marler, 2009). The desire for power and recognition associated with narcissism should lead narcissistic people to be more motivated to strive for the accomplishment of personal (career) goals and be more actively engaged in promoting their career via career behaviors such as gaining visibility, positioning behaviors, or self-presentation. We hence hypothesize:

Hypothesis 5: Narcissism is positively related to career engagement.

In line with the reasoning presented above, we propose that the effects of narcissism on career success are mediated by more active career behaviors.

Hypothesis 6: There is an indirect effect of narcissism on (a) salary and (b) career satisfaction through increased career engagement.

5.2 Method

5.2.1 Participants and Procedure

We recruited alumni of three universities in Germany who were contacted by sending an email ($N = 634$) to addresses provided in a previous study on career development, with a 50% ($n = 314$) response rate, 68% female, age $M = 29$ years ($SD = 4$), and 2.1 ($SD = 2.8$) years of working experience. A minority of 33% had a Bachelor's degree, 59% had a Master's degree, and 8% had other degrees. They worked in a diverse range of industries, most commonly in business administration (21%), education (18%), and advertising and marketing (12%). Participation was voluntary and a total value of 1,150 Euros was offered in lottery drawings as an incentive.

5.2.2 Measures

Means, standard deviations, Cronbach's alpha estimates, and correlations between measures are displayed in Table 9.

Narcissism. Narcissism was measured with the short version of the German language adaptation of the narcissistic personality inventory (NPI; Raskin & Hall, 1979; Schutz, Marcus, & Sellin, 2004) consisting of 15 forced-choice items.

Occupational self-efficacy beliefs. We applied the six items of the occupational self-efficacy scale developed and validated by Rigotti, Schyns, and Mohr (2008). Participants were asked to respond on a six-point Likert scale.

Career engagement. We used the career engagement scale (Hirschi, Freund, & Herrmann, 2014), which assesses the general degree to which a person has demonstrated

various proactive behaviors to develop his or her career in the past six months. Answers were provided on a five-point Likert scale.

Salary. We asked respondents to indicate their salary according to one of seven categories ranging from below 10,000 Euro to above 60,000 Euro gross annual income, in steps of 10,000 Euro per category. This resulted in a normally distributed scale with a skew of 0.02 ($SD = 0.14$). Thus, no further transformation of the scale was necessary.

Career satisfaction. We used the German version (Abele & Spurk, 2009) of the career satisfaction scale by Greenhaus et al. (1990). The scale includes five items with a five-point Likert scale.

5.3 Results

The results in Table 9 show that narcissism showed a weak but significant correlation with salary and career satisfaction, confirming Hypotheses 1 and 2, respectively. Narcissism also moderately correlated with occupational self-efficacy and career engagement, confirming Hypotheses 3 and 5, respectively.

To assess the proposed indirect effects of narcissism on career success via occupational self-efficacy and career engagement, we conducted a multiple mediation model with 5,000 bootstrapping samples and the PROCESS syntax for SPSS by Hayes (2013). Occupational self-efficacy, but not career engagement or narcissism, had a specific direct effect on salary beyond that of the other assessed variables (Table 10). The bootstrapping results revealed a specific indirect effect of narcissism on salary through increased occupational self-efficacy, but not on career engagement, confirming Hypothesis 4a and refuting Hypothesis 6a. Using career satisfaction as the outcome, occupational self-efficacy and career engagement, but not narcissism, showed specific direct effects. The bootstrapping results confirmed significant specific indirect effects for both mediating variables, confirming Hypotheses 4b and 6b, respectively. The models explained 5% variance in salary, $F(3,289) = 4.70, p < .01$, and 21% variance in career satisfaction, $F(3,310) = 26.77, p < .001$.

Table 9: Summary of Intercorrelations, Means, Standard Deviations, Cronbachs' Alpha among the Assessed Constructs

	Mean	SD	1	2	3	4	5
1 Narcissism	5.81	3.22	(.76)				
2 Self-efficacy	4.53	0.55	.27***	(.83)			
3 Career engagement	3.42	0.81	.22***	.21***	(.87)		
4 Salary ^a	-	-	.11*	.21***	.01	(-)	
5 Career satisfaction	3.70	0.74	.10*	.42***	.25***	.32***	(.85)

Note. $N = 314$ for variables 1, 2, 3, and 5; ^a $N = 291$, because not all participants indicated their salary; entries in parentheses in diagonal are the Cronbach's alpha reliability coefficients.

* $p < .05$; *** $p < .001$ (one-tailed)

Table 10: *Specific Direct, Indirect, and Conditional Indirect Effects on Salary and Career Satisfaction*

	Salary (<i>N</i> = 291)				Career satisfaction (<i>N</i> = 314)			
	<i>Dependent variable model (specific direct effects)</i>							
<i>Predictor</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	3.59	0.73	4.90	<.001	5.63	1.45	3.89	<.001
Self-efficacy	0.84	0.03	3.23	.001	0.39	0.52	7.45	<.001
Career engagement	-0.01	0.01	-0.74	.46	0.09	0.03	3.36	<.01
Narcissism	0.03	0.04	0.92	.36	-0.07	0.07	-0.95	.34
	<i>Indirect effects</i>							
	Point estimate	<i>SE</i>	Bootstrapping BC 95% CI		Point estimate	<i>SE</i>	Bootstrapping BC 95% CI	
<i>Mediator</i>			Lower	Higher			Lower	Higher
Self-efficacy	0.38	0.14	0.01	0.07†	0.15	0.36	0.08	0.23†
Career engagement	-0.01	0.01	-0.03	0.01	0.05	0.02	0.02	0.11†
Total indirect effect	0.03	0.02	0.00	0.06†	0.20	0.04	0.13	0.29†

Note. † = 95%-CI does not include zero. Sample sizes vary because not all participants indicated their salary.

5.4 Discussion

Our study advances extant research that focused on the relationship between narcissism and organizational variables and shows that narcissism is positively correlated with career development variables. However, the correlations with the examined career success indicators were very small. For career satisfaction, this suggests that traits such proactivity or neuroticism, for which larger correlations were observed in meta-analytic findings (Ng et al., 2005; Ng & Feldman, 2014b), might be more important than narcissism. However, the weak

correlation with salary is comparable to that found for other traits and confirms that salary depends less on personality and more on parental socio-economic status or obtained educational level (Ng et al., 2005; Ng & Feldman, 2014a).

We could show that narcissism might exert indirect effects on both career success indicators. The results for the mediation model suggest that there are different pathways explaining why narcissism is related to objective and subjective career success. Occupational self-efficacy seems to be important for both objective and subjective success, while career engagement only mediated the effect of narcissism on career satisfaction but not on salary. First, these results confirm that objective and subjective indicators of career success can depend on different antecedents (Ng et al., 2005). Second, it corroborates the importance of self-efficacy in the career domain as a pivotal predictor of career outcomes and a mediator of more distal traits (Lent et al., 1994). Third, it reflects meta-analytic findings (Ng et al., 2005) that proactivity and career planning (indicators of career engagement) are more strongly related to career satisfaction than to salary.

5.4.1 Limitations and Conclusions

There are some limitations to consider when evaluating our findings. First, we obtained self-reported, cross-sectional data. Ratings by other people, archival data on objective career success, or longitudinal assessment of effects might further strengthen the validity of the obtained results. Additionally, the cross-sectional nature of our data does not allow making causal claims as to whether narcissism causes the assessed career development variables or whether other factors not assessed in this study can explain their relationships. Second, we sampled young professionals and it is possible that the observed effects would be different for employees with longer work histories affecting their career success.

In conclusion, the findings of this study enrich our understanding of the implications of narcissism in the work domain. Researchers have speculated about why narcissistic people often get ahead in their careers, focusing on the positive impression that narcissistic people

make in recruiting and promotion settings (Campbell et al., 2011). Our findings imply that one reason for the positive career advancement of narcissists might lie in their more active and confident approach to career development. Because narcissists feel special and entitled to success, they seem to possess more confidence in mastering challenges in their careers and are more engaged in proactively promoting and managing their careers. In combination, these attitudinal and behavioral career variables seem to be important factors that go beyond mere impression management in explaining their career success.

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6 General Discussion

Career preparation is a major task during career development and its factors (i.e., career decidedness, planning, confidence, and career engagement) are associated with important career outcomes such as increased salary, higher position in the organization, and more career satisfaction (Abele & Spurk, 2009) as well as with wellbeing (e.g., life satisfaction; Skorikov, 2007). In consideration of the central role career preparation plays for the career development, there is a rising body of research on this topic. However, most of it focused on samples of adolescence in the school-to-work transition. Because time at university reflects a phase that is relevant to career development, there is a need for research exploring career preparation as well as its facilitators and outcomes among young adults facing the challenge of the transition from university to work.

Against this background, first, I aimed to investigate how attitudinal and behavioral factors of career preparation (i.e., career decidedness, planning, confidence, and career engagement) develop and interact over time among university students and university graduates. Second, I examined whether personal characteristics such as indecisiveness, narcissism, and core self-evaluations as well as career-related variables such as vocational interests and protean career orientation facilitate attitudinal and behavioral factors of career preparations. Third, I investigated if factors of career preparation lead to important career and life outcomes in terms of career success and life quality (i.e. satisfaction with life). In the following section, I will summarize the key findings of the dissertation. In addition, I will discuss the main contributions for theory and practice and provide implications. Afterwards, I will reflect the strengths and limitations of the dissertation and suggest future directions for research on career preparation. Finally, I will conclude with a brief summary.

6.1 Overview of Findings

To sum up, the cumulative findings of the present dissertation advance the field of vocational psychology by providing important new insights regarding the relevance of career preparation (Skorikov, 2007) in the critical time of the transition from university to work for career development.

The results of the first paper (Chapter 2) provide evidence for the trait-like nature of career indecisiveness that has been frequently assumed in the literature (e.g., Osipow, 1999) but has not been clearly established due to shortcomings in the applied research methodologies. A key finding across three samples and different time lags was that career indecision is influenced by a stable component and is less affected by situational influences. This finding extended existing research on the persistence and stability of indecisiveness (e.g., Gati, Asulin-Peretz, & Fisher, 2012; Germeijs, Verschueren, & Soenens, 2006). In addition, results revealed that the empirically assessed stable component of career indecision (i.e., career indecisiveness) was negatively related to core self-evaluations and occupational self-efficacy while being positively related to perceived career barriers. This finding is in line with previous research on career indecision (e.g., Di Fabio, Palazzeschi, & Bar-On, 2012; Patton, Creed, & Watson, 2003), confirming that a negative appraisal of individual worthiness is associated with more career decision-making problems. However, the study does not permit claims about causality and it is possible as well that problems in career decision-making could lead to negative self-perceptions. Furthermore, the stable career indecision component was found to be an important determinant in predicting student life satisfaction.

The second paper (Chapter 3) expands knowledge from earlier studies (e.g., Hirschi & Läge, 2007; Tracey & Robbins, 2005) that have examined Holland's (1997) secondary construct among adolescents. Among university students, the results partially supported the assumption that Holland's (1997) vocational interest characteristics— i.e., interest congruence, interest differentiation, and general interest level (elevation)—can be regarded as

indicators for career development among university students. While congruence was not significantly related to career preparedness, higher values in interest differentiation were associated with higher career decidedness and more career engagement while higher values in elevation were related to higher occupational self-efficacy beliefs and more career engagement. In particular, career engagement as a behavioral factor of career preparedness showed the strongest, most frequent, and diverse relationships with the secondary constructs.

The results of the third paper (Chapter 4) reveal that protean career orientation (PCO) acts as a facilitator in developing career preparation in terms of vocational identity clarity and occupational self-efficacy. Additionally, the findings show that identity clarity and self-efficacy mediate the effects of PCO on career satisfaction and proactive career behaviors. Furthermore, the results indicate that PCO explains unique variance only in proactive career behaviors but not in job satisfaction or career satisfaction beyond vocational identity clarity and occupational self-efficacy. The findings suggest that PCO is closely related to components of career preparation by enhancing these career attitudes.

The results of the fourth paper (Chapter 5) indicate that narcissism might exert indirect effects on both objective and subjective indicators of career success among university graduates. The findings for the mediation model suggest that there are different pathways explaining why narcissism is related to career success: Occupational self-efficacy as an attitudinal indicator of career preparedness seems to be important for both objective and subjective success, while career engagement as a behavioral indicator of career preparation only mediated the effect of narcissism on career satisfaction but not on salary. The finding highlighted the importance of self-efficacy in the career domain as a pivotal predictor of career outcomes and a mediator of more distal traits (Lent, Brown, & Hackett, 1994).

In sum, the results of the dissertation provide support to the relevance of career preparation in respect of its relationships with career-related variables (e.g., protean career orientation, perceived career barriers) and personality-related variables (e.g., core self-

evaluations, narcissism), as well as to important career outcomes (e.g., career and life satisfaction).

6.2 Implications for Theory and Practice

The research of the dissertation expands knowledge from earlier studies (e.g., (Stringer, Kerpelman, & Skorikov, 2011, 2012) that have focused on the transition from school to work. Several implications that are relevant not only for research but also for career counseling practice can be derived from the findings of the dissertation at hand.

The most notable contribution of the first paper to research and career counseling is the result that career indecision consists of both trait and state components and that these can be measured. Therefore, the study makes an important and unique contribution to the literature that goes beyond simply assuming the trait-like nature of career indecisiveness (e.g., Osipow, 1999) while empirical evidence was lacking so far. Additionally, this finding might also require different counseling approaches: The state of career indecision might be improved due to (self-) guided career exploration and planning. Career counselors could assist students by providing career information and self-assessments. However, the stable trait of career indecision will not be resolved by simply providing career information. Consequently, these students would need more profound counseling: Addressing the stable component of career indecision means to pay attention to negative self-views, perceived barriers, and self-efficacy beliefs. Moreover, students' general life satisfaction is associated with persistent problems in career decision-making. It seems possible that career dissatisfaction is at least partially due to low decidedness and low confidence. This calls for holistic career counseling approaches that integrate career and non-career issues to increase student's overall wellbeing.

The results of second paper highlight the importance of interest differentiation and interest elevation for career decidedness, career engagement, and occupational self-efficacy. This could imply that career counseling tapping the secondary constructs might also foster

positive career development among university students. For instance, career counseling programs at universities might include components that are especially directed to the clear differentiation of interests or to develop multiple career-related interests. Furthermore, the fact that career engagement is associated with interest differentiation and elevation might imply that interest profile shaping within counseling activities could affect important career behaviors such as networking, self-exploration and information seeking.

Results of paper 3 showed that factors of career preparation (i.e., identity and self-efficacy) mediate some of the effects of PCO on important career outcomes. For counselling practice, this result implies that it would be fruitful to put more focus on increasing vocational identity clarity and occupational self-efficacy, since these two attitudes act as proximal mediators of the positive effects of a PCO.

Results of the fourth paper imply that narcissism might exert indirect effects on both career satisfaction and salary. The findings suggest that there are different pathways explaining why narcissism is related to objective and subjective career success. Occupational self-efficacy seems to be important for both objective and subjective success, while career engagement only mediated the effect of narcissism on career satisfaction but not on salary. These results confirm that objective and subjective indicators of career success can depend on different antecedents (Ng, Eby, Sorensen, & Feldman, 2005) and indicate that one reason for the positive career advancement of narcissists might lie in their more active and confident approach to career development.

6.3 Strengths, Limitations and Future Directions

In the present dissertation different strength and limitations can be identified. First, one of the strengths is the application of diverse data sets. In the first paper (Persistent Career Indecision over Time), three different groups of students were examined to empirically assess the stable component of career indecision over time with a total of $N = 1,423$ participants.

Furthermore, time lags of the three-wave longitudinal panel design were varied: I chose a period of 14 weeks (including three measurement waves, each 7 weeks apart) for one group and for the other groups, the data collection points spanned one year with three waves each six months apart. In the third paper (Protean Career Orientation), the sample of 563 university students was extended by 202 young professionals. In this paper, the time lags vary from six month (sample of alumni) to one year (sample of university students). The second paper (Vocational Interests and Career Preparedness) and the fourth paper (Narcissism and Career Success) are based on cross-sectional data; however, they include samples of university students as well as university alumni and young professionals. To sum up, the use of different sample groups and time lags contributes to the generalizability of the dissertation's results. Additionally, causal inferences were supported by the longitudinal design.

Second, the comprehensive search for facilitators and outcomes of career preparation is another strength of the current dissertation. By exploring whether personal characteristics (e.g., indecisiveness and narcissism) as well as career-related factors (e.g., vocational interests and protean career orientation) facilitate attitudinal and behavioral factors of career preparations, I extend the nomological net of career preparedness. Furthermore, important outcomes of career preparation factors are identified (e.g. student's life satisfaction). Third, this dissertation not only investigates career preparation in terms of attitudinal components such as career decidedness, planning, and confidence, but also in terms of one behavioral component, career engagement, that displays actual behavior (Hirschi, Freund, & Herrmann, 2014). By analyzing this behavioral component, I was able to draw a broader picture compared to studies that have investigated attitudes of career preparation only (Skorikov, 2007).

Apart from the strengths of the dissertation I have just mentioned, there are two limitations that should also be discussed. First, the nature of the study samples limits the generalizability of the results due to their exclusively German origin. Future research should

examine career preparation among university students using supranational approaches to compare different cultural settings, especially taking into account different educational systems. Second, the studies are somewhat limited because they relied exclusively on self-reported data. Although the constructs studied in the current dissertation can be considered distinct from each other as shown by preliminary analyses, common method bias cannot be ruled out because all variables were collected as self-reported data (Podsakoff, MacKenzie, & Podsakoff, 2012). However, the applied longitudinal assessments in paper 1 and paper 3 significantly diminish the possibility of common method bias. Furthermore, we should note that cross-sectional data limits the casual interpretation of the results. Therefore, future studies might examine the revealed relationships in our studies using other-referred measures (e.g., peer-ratings) and collect longitudinal data to reduce common method bias.

Finally, future research could investigate additional factors (e.g., motivational aspects, job and organizational engagement) in order to generate a more complete picture of the causes and consequences of career preparation.

6.4 Summary

In conclusion, this dissertation has addressed the relevance of career preparation among emerging adults with higher education in Germany. Especially, I shed light onto career preparation among university students and onto its relationships to career-related variables such as protean career orientation as well as to personality-related variables (e.g., core self-evaluations). Furthermore, I highlighted career preparation to have significant effects on personal and career-related outcomes such as career and life satisfaction. In particular, I extended the body of literature on career preparation that has focused on adolescence using different personality and career-related variables to explain facilitators and outcomes of career preparation among university students. In the future, research on career preparation will be necessary to further deal with causes and more long-term consequences of career preparation.

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