The Dynamics of Occupational Career Trajectories

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Publication date:
2022-05

Permanent link:
https://doi.org/https://doi.org/10.3929/ethz-b-000547718

DISS. ETH NO. 28374

THE DYNAMICS OF OCCUPATIONAL CAREER TRAJECTORIES

A thesis submitted to attain the degree of

DOCTOR OF SCIENCES of ETH ZURICH

(Dr. sc. ETH Zurich)

presented by

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2022

Change is the only constant in life.

(Heraclitus)

Acknowledgements

First and foremost I want to thank my supervisor Gudela Grote. You gave me the freedom to develop this thesis within a stimulating, self-determined, and trusting working environment, and provided me with valuable feedback and guidance throughout this whole process. Thank you for the inspiring discussions, your sense of humor, and for having my back.

I also want to thank Beatrice Van der Heijden for co-advising my thesis, and for the uncomplicated and motivating exchange during this process. Furthermore, I would like to thank my colleagues and coauthors from the University of Bern, Andreas Hirschi, Ivana Igic, and Claire Leeming (Johnston), for their helpful comments, the hands-on work on the manuscripts, and the vivid discussions along the way.

A special thank you goes to my current and former colleagues from the Chair of Work and Organizational Psychology at ETH Zurich for creating a supportive and fun team atmosphere, in real life and virtually. In particular, I want to thank Cécile Tschopp for her mentoring and engagement in the first dissertation study, and Marisa Roth for her invaluable support in my second dissertation study. I also want to specifically thank Julian Pfrombeck and Jan Schmutz who accompanied me during this whole PhD. Thank you for making this path so treasurable.

Lastly, I want to thank my family and friends for encouraging me to start this journey in the first place. Thank you for always being there for me, for creating the balance on the other side, and for making sure that I keep my focus, especially during the last phase of my PhD. And I want to thank Timothy and Finn, who make every day, and every sleepless night, worthwhile.

Summary

Contemporary careers are characterized by manifold socio-economic and technological transformations, that will transform work design across virtually all occupations. Considering such rapid developments, individuals have to adapt to ever changing work environments within their occupations, or, alternatively, pursue different career paths and exit their occupations. Yet, occupations are fundamental reference points that guide individual career development and provide individuals with meaning, identity, and direction in their careers, making occupational change a costly major transition. While job and organizational mobility are a frequent, and well understood phenomenon, research on occupational mobility is scarce. Therefore, the objective of this thesis is to gain a better understanding of the process leading to occupational mobility, and stability.

This thesis consists of three dissertation studies that predominantly build on the specifics of the Swiss vocational education and training system. The first study investigates the impact of work design features experienced during vocational preparation on satisfaction with the training occupation, and occupational change in vocational careers. The second study explores what individuals do to maintain their occupational stability. Finally, the third study examines the influence of technological self-efficacy on occupational mobility intentions. The results of thesis show that vocational education and training sets the stage for occupational stability. To maintain this stability throughout the career, specific strategies are used that include both proactive and reactive elements. And given technological advancements, both self-efficacy beliefs, and contextual variables are important predictors of occupational mobility intentions. Informed by these findings, this thesis advances our understanding of the dynamics of occupational career trajectories throughout different career phases and provides meaningful practical implications on how sustained occupational stability can be promoted.

Zusammenfassung

Heutige Karrieren sind durch vielfältige sozioökonomische und technologische Transformationen gekennzeichnet, welche die Arbeitsgestaltung in praktisch allen Berufen verändern werden. Individuen müssen sich daher an sich verändernde Arbeitsumgebungen in ihren Berufen anpassen oder alternative Karrierewege einschlagen und ihre Berufe verlassen. Weil Berufe jedoch grundlegende Bezugspunkte sind, welche die individuelle Entwicklung leiten und Individuen Sinn, Identität und Richtung in ihren Karrieren geben, sind Berufswechsel folgenreiche Transitionen. Während Mobilität zwischen Organisationen relativ häufig, und daher ein gut verstandenes Phänomen ist, gibt es nur wenig Forschung zur beruflichen Mobilität. Es ist daher das Ziel der vorliegenden Dissertation, ein besseres Verständnis der Prozesse zu erlangen, die zu beruflicher Mobilität und Stabilität führen.

Die Dissertation besteht aus drei Studien, welche überwiegend auf den Besonderheiten des schweizerischen Berufsbildungssystems basieren. Die erste Studie untersucht, inwiefern Arbeitsgestaltungsmerkmale aus der Zeit der Berufslehre einen Einfluss auf die Zufriedenheit mit dem Lehrberuf und auf spätere Berufswechsel haben. Die zweite Studie untersucht was Individuen selbst tun, um ihre berufliche Stabilität aufrechtzuerhalten. Schließlich untersucht die dritte Studie den Einfluss der technologischen Selbstwirksamkeit auf berufliche Mobilitätsabsichten. Die Ergebnisse der Dissertation zeigen, dass bereits in der Berufsehre die Voraussetzungen für berufliche Stabilität geschaffen werden. Um diese Stabilität während der gesamten Laufbahn aufrechtzuerhalten, werden spezifische Strategien genutzt, die sowohl proaktive als auch reaktive Elemente umfassen. Und in Anbetracht des technologischen Fortschritts sind sowohl Selbstwirksamkeitsüberzeugungen als auch Kontextvariablen wichtige Prädiktoren für berufliche Mobilitätsabsichten. Die Erkenntnisse dieser Dissertation erweitern unser Verständnis der Dynamik beruflicher Karriereverläufe und liefern zudem Hinweise für die Praxis, wie berufliche Stabilität gefördert werden kann.

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Part I

1. Introduction

Occupations create meaning and direction in careers (Kreiner et al., 2006; Lee et al., 2000), and provide individuals with specific occupational identities (Hauschildt & Heinemann, 2013). Consequently, occupations are considered fundamental reference points for individual career development (Anteby et al., 2016), also in light of destabilized organizational affiliations in more boundaryless careers (Currie et al., 2006; Dierdorff, 2019). The rapid social-economic and technological change that characterizes contemporary careers (Greenhaus & Kossek, 2014) will nevertheless transform work design in virtually all occupations (Parker & Grote, 2020), and individuals have to respond to these changes in their work environments (Jansen & Shipp, 2019) also within the boundaries of their occupations. In occupations that are based on vocational education and training, the link between occupation specific skills and labor market demands is particularly high, making occupational change a costly transition with regards to occupational identity (Grunow & Mayer, 2007), and specific human capital loss (Eggenberger et al., 2018). As research has, for the most part, focused on the more frequent job change, or organizational mobility (Rodrigues & Guest, 2010), we know little about the predictors of occupational change (Carless & Arnup, 2011; Dlouhy & Biemann, 2018), and stability, respectively.

The overarching goal of the thesis is to advance the knowledge on the dynamics of occupational career trajectories. To this end, together with my coauthors, I conducted three scientific studies that target antecedents of occupational change, investigated the process of occupational stability maintenance, and examined individual and contextual factors that contribute to occupational mobility intentions. In my first dissertation study, I focused on the impact of work characteristics and satisfaction with the trained occupation during vocational preparation as predictors of occupational mobility. The study also included measures from later career, allowing to draw conclusions about the long-lasting influence of the formative experience during vocational education and training. In my second dissertation study, I investigated how individuals maintain stability in their occupations throughout their careers, present eight strategies of occupational stability maintenance, and discussed theoretical as well as practical implications of the findings, combining literature on job crafting and the life-span theory of control. Finally, in my third dissertation study, drawing on social cognitive career theory, I investigated how technology specific self-efficacy beliefs impact occupational commitment and mobility intentions in light of technological advancement.

With this dissertation, I aim to contribute to the literature in multiple ways. First, I provide empirical evidence regarding the formative impact of work characteristics experienced during vocational preparation with the first dissertation study and highlight their lasting influence for stable vocational career trajectories. Second, I shed light on the process of occupational stability maintenance in my second dissertation study, describe distinct proactive and reactive strategies of stability maintenance, and introduce the concept of occupational crafting, complementing existing literature on job crafting (Wrzesniewski & Dutton, 2001). Third, I expand the knowledge on the impact of technological advancement on vocational career trajectories by introducing technological self-efficacy as an important person-related variable for sustained occupational stability. Finally, the findings from the present thesis also yield practical recommendations for individuals, organizations, and occupational associations on how occupational stability can be promoted.

This dissertation is organized in two parts. In part one, I first present relevant literature and discuss central theoretical concepts in the theoretical background. I then provide an overview of the present thesis, including the research aim and methodological approaches, and provide a summary of the three scientific papers. Finally, I present the main findings of the papers, and discuss theoretical and practical implications, as well as limitations. In part two, I present the three scientific papers that form this thesis.

2. Theoretical Background

In the following chapter, I will present an overview of the relevant literature that forms this thesis's theoretical basis. First, I will outline why it is (still) important to adopt an occupational lens in career research, present the framework of vocational education and training (VET), and discuss its relation to occupational identity and commitment. I then summarize research on occupational mobility and highlight the role of work design for vocational careers. Second, I discuss how adaptive career management is needed for sustainable career trajectories, also in light of technological advancement, and suggest the relevance of control theories for the understanding of occupational mobility. As the present thesis is embedded within the context of VET, I will describe how the introduced constructs relate to the specifics of VET throughout the different sections.

2.1. Adopting an Occupational Lens in Contemporary Career Research

Occupations are fundamental reference points in individuals' careers (Anteby et al., 2016) that form the conceptual framework of why, how, and when individuals act in work place settings (Dierdorff, 2019). Vocational behavior, defined as "all the responses an individual makes in choosing and adjusting to an occupation" (Crites, 1969, p. 16), has a longstanding research tradition (Savickas, 2021), including research on career choice (Fouad, 2007), and career development (Brown & Lent, 2016). Careers, that is "the evolving sequence of a person's work experience over time" (Arthur et al., 1989, p. 8), still entail large degrees of occupational stability for many individuals, despite changes in jobs, and across organizational boundaries (Fitzenberger, 2005; Longhi & Brynin, 2010; Zimmerman et al., 2020). However, contemporary careers are characterized by rapid socio-economic and technological changes (Greenhaus & Kossek, 2014), which impact the sustainability and applicability of established skills and lead to the need for personal development throughout the entire career (Van der Heijden et al., 2016). In addition, as technological advancement is expected to dramatically effect and possibly abolish numerous tasks within occupations (Arntz et al., 2016; Bessen, 2016), individuals will have to deal with transformed work design, too (Parker & Grote, 2020). For example, most analyses at medical practices are today performed by machines, replacing complex, and sometimes even dangerous manual activities that medical assistants used to perform some years ago. Thus, also within the stabilizing boundaries of occupations, individuals have to adapt to changes in their work environments and job requirements throughout their careers (Jansen & Shipp, 2019; Van Vianen, 2018).

Occupations consist of specific collections of tasks and work role requirements that call for a particular set of knowledge and skills to successfully complete these tasks (Dierdorff et al., 2009). As occupations are also important and distinct sources of work-related meaning and identity (Dierdorff, 2019; Lee et al., 2000), occupational change is considered a costly transition (Kidd & Green, 2006). This applies also to specific human capital investments (Becker, 1962; Blau, 2007; Feldman & Ng, 2007), that are at least partially lost when entering a new occupational domain (Kambourov & Manovskii, 2008). Yet, research on career mobility has, for the most part, focused on mobility across jobs and organizations (Rodrigues & Guest, 2010), while literature on occupational change is scarce (Carless & Arnup, 2011). In line with the notion that occupational affiliations are expected fill the void of destabilized organizational affiliations in more boundaryless careers (Currie et al., 2006), it is, therefore, important to gain a better understanding of how and why individuals navigate their careers within and across the boundaries of their occupations (Anteby et al., 2016).

2.1.1. The Framework of Vocational Education and Training

National education and training systems impact and shape individual agency and career development throughout the life course, therefore, they are a relevant factor that needs to be taken into account when studying career trajectories (Tomlinson et al., 2018). In educational systems that are based on VET, such occupation specific qualifications are carefully built during the years of apprenticeship (Eggenberger et al., 2018). Several European countries have apprenticeship based VET systems, like Switzerland, Germany, or Austria (Wolter & Ryan, 2011). In these countries, dual-track programs which combine work-based training and formal education are offered that produce graduates with qualifications at an intermediate skill level, and form the basis for further education and life-long learning (Grunow & Mayer, 2007; Wolter & Ryan, 2011). From an economic perspective, VET represents specific human capital investments in apprentices' future productivity, which is linked to economic variables like earnings and employment (Becker, 1962). Human capital not only benefits the individual, but also broader economy in terms of accumulated human capital, which increases general wealth (World Bank, 2019). Thus, with its documented potential for economic prosperity, governments are interested in building educational systems that foster human capital development. Consequently, VET has gained traction for many occupations also in countries such as the United States (Fuller & Sigelman, 2017; Smith & Kemmis, 2013; World Bank, 2019). However, the value of VET is not only linked to human capital but has been highlighted as a relevant context for the development of occupational identity, and occupational commitment (Cohen, 2007; Frese, 2008; Medici et al., 2020).

2.2. Occupational Identity and Occupational Commitment

Occupational identity refers to the occupation-specific "conscious awareness of oneself as a worker" (Skorikov & Vondracek, 2011, p. 693). It derives from a persons' association with an occupation and provides individuals with meaning and direction in their careers (Kreiner et al., 2006). Occupational identity holds a different meaning for each occupation (Hauschildt & Heinemann, 2013) as it is formed "over time with varied experiences and meaningful feedback" (Ibarra, 2006, p. 3). The development of one's occupational identity is considered a critical developmental task for adolescents (Erikson, 1968; Skorikov & Vondracek, 1998), resulting in a coherent and stable picture of a person's career interests, goals, and abilities (Holland, 1985). VET is particularly suited to promote occupational identity development as adolescents are able to explore their new social role in a real work context already during their apprenticeship (Zimmer-Gembeck & Mortimer, 2006). Such a formative work environment that promotes learning and integrates apprentices well into the work process, thus, provides a solid basis for the development of occupational identity (Hauschildt & Heinemann, 2013). Occupational identity in turn promotes systematic career decision making (Skorikov & Vondracek, 2011) and is positively related to further beneficial outcomes, like psychological well-being, performance, self-efficacy, career satisfaction, and occupational commitment (Baruch & Cohen, 2007; Cohen, 2007; Hauschildt & Heinemann, 2013; Hirschi et al., 2017).

Occupational commitment describes the "psychological link between a person and their occupation" (Lee et al., 2000, p. 800) and is, too, related to various positive (e.g., job satisfaction), and negative work experiences (e.g., stress) (Chang et al., 2007; Lee et al., 2000). Committed individuals identify strongly with their occupations and have positive feelings about it (Blau, 1985). Frequently broken into the three dimensions affective (i.e., a person's desire to remain in the occupation), normative (i.e., obligation to remain in the occupation), and continuance commitment (i.e., perceived cost associated with leaving the occupation), it provides a comprehensive understanding of an individual's tie to their occupation (Meyer et al., 1993). While most studies focus on the affective component of occupational commitment, different conceptualizations exist, which, too, are related to occupational identity and occupational change (Blau, 2009; Meyer & Espinoza, 2016). Occupational commitment can be fostered through the provision of beneficial work conditions, like opportunities for professional development (Meyer & Espinoza, 2016), and, specifically in the context of VET, through high quality training provided by VET trainers, and a good integration of apprentices into the work process and team (Hauschildt & Heinemann, 2013). With its immediate focus on the occupation rather than the employing organization, it has been suggested that VET specifically impacts occupational commitment (Cohen, 2007). Consequently, committed individuals are less likely to leave their occupations and exhibit higher levels of career and life satisfaction (Baruch et al., 2014; Lee et al., 2000; Meyer & Espinoza, 2016; Yousaf et al., 2015) after having received specific training (Shniper, 2005), such as VET.

2.3. Occupational Mobility in Vocational Careers

As career development is considered a lifelong personal growth process, change has become a normal aspect of individuals‘ careers (Ahn et al., 2017). Yet, while employees on average change organizations every one to eight years, occupational change only occurs three times in an individual’s working life (Bolles, 2006). Accordingly, the respective literature predominantly discusses changes in jobs and across organizational boundaries (Rodrigues & Guest, 2010), while research on mobility between occupations, or occupational change, is scarce, and called for (Anteby et al., 2016; Carless & Arnup, 2011; Dlouhy & Biemann, 2018). Occupational change is defined as the movement into a new occupation that requires additional training, education, or vocational preparation (Feldman, 2002), whereas job change refers to career mobility within the same occupation (Ng et al., 2007). Because occupations consist of institutionally defined and regulated bundles of qualifications (Grunow & Mayer, 2007), changing ones’ occupation comes with considerable cost with regards to occupational identity development and human capital investments (Becker, 1962; Skorikov & Vondracek, 2011). Consequently, occupational change is considered a major transition in individuals’ career paths (Feldman & Ng, 2007). Furthermore, in VET based occupations, where occupation-specific human capital is developed during apprenticeship

(Eggenberger et al., 2018), occupational mobility is not only costly for individuals and organizations, but as well for the broader society with its public investments in educational systems (Becker, 1962; Brett, 1980). Therefore, a better understanding of the process of occupational mobility is crucial for both research and practice.

Although studying actual occupational change has recently gained traction (Darvin, 2020; Dlouhy & Biemann, 2018; Kornblum et al., 2018; Medici et al., 2020), many studies use occupational withdrawal intentions as a proxy in their research designs (Howes & Goodman-Delahunty, 2015; Otto et al., 2010; Van der Heijden et al., 2019). Yet, because the relationship between turnover intentions and actual change is only modest for job turnover (Griffeth et al., 2000), the two constructs need to be analyzed separately (Rubenstein et al., 2018). Predictors of actual mobility include personality traits, human capital investments, job security, and occupational mobility intentions (Carless & Arnup, 2011), while job resources, personal attributes or traits, occupational embeddedness, boundarylessness, occupational commitment, as well as uncertainty tolerance have been introduced as predictors of mobility intentions (Coder, 2007; De Cuyper et al., 2011; Howes & Goodman-Delahunty, 2015; Otto et al., 2010). Especially work satisfaction, defined as the positive evaluation of the current situation at work (Otto et al., 2010), has emerged as a powerful predictor for both occupational mobility intentions, and actual mobility (Blau, 2000; Li et al., 2019; Medici et al., 2020).

2.3.1. The Impact of Work Design

The impact of work design on employees' satisfaction and motivation at work is already discussed in Hackman and Oldham's (1976) seminal job characteristics model. The model suggests that the five core work characteristics skill variety, task identity, task significance, autonomy, and feedback lead to three critical psychological states: experiencing meaning, experiencing responsibility for work outcomes, and understanding the results of one's efforts. These states, in turn, should promote employees' intrinsic motivation, performance, and work satisfaction, while reducing turnover (Parker, 2014). Skill variety relates to the degree that a variety of different activities and skills are needed, while task identity refers doing a task from beginning to end. Task significance describes "the degree to which a job has a substantial impact on the lives or work of others", and autonomy "the degree to which a job provides discretion over daily work decisions, such as when and how to do tasks" (Parker, 2014, p. 664). Finally, feedback refers to the degree to which information about ones' performance is provided by the job. Although the full model has not been consistently supported (Parker et al., 2017), the central proposition concerning the influence of work characteristics on attitudinal outcomes, like work satisfaction, is well established, as the meta-analysis by Humphrey and colleagues (2007) demonstrates.

Work design comprises "the content and organization of one's work tasks, activities, relationships, and responsibilities" (Parker, 2014, p. 662) and is, consequently, specific to the occupational context (Dierdorff & Morgeson, 2013). In VET based occupations, young adults experience the work design features of their training occupation already during the years of apprenticeship, where the socialization impact is likely to be the greatest (Frese, 1982). Thus, the formative work experience is not only expected to affect the current work satisfaction, but, over time, also to form apprentices' occupational identity and impact later career development (Ibarra, 2006; Ibarra & Barbulescu, 2010).

2.3.2. Job Crafting as a Proactive Behavior

As jobs are no longer considered static but have become dynamic in light of constantly shifting and changing work roles, tasks, and projects, employees increasingly need to be active participants in work design, that engage in proactive behaviors, like job crafting (Grant & Parker, 2009). Job crafting is a specific, proactive work behavior that describes "the proactive steps that employees take to modify the cognitive, physical, and relational boundaries of their work" (Grant & Parker, 2009, p. 342). Employees craft their jobs motivated by three basic psychological needs: asserting control over their work life, creating a positive self-image, and fulfilling the need for connection with others (Wrzesniewski & Dutton, 2001). Job crafting promotes many beneficial outcomes, like increased organizational commitment (Leana et al., 2009), meaningfulness (Wrzesniewski et al., 2013), work engagement and job satisfaction (Bakker et al., 2012; Tims et al., 2013), or improved performance at work (Bindl et al., 2018; Petrou et al., 2015). Moreover, as individuals craft their jobs improve the fit to their work environment (Tims & Bakker, 2010), it also prevents negative work outcomes like turnover intentions (Rudolph et al., 2017). Conversely, if work design is characterized by unfavorable work characteristics, employees experience dissatisfaction, which can result in organizational (Tschopp et al., 2014), as well as occupational mobility (Masdonati et al., 2017). Recently, Wang and colleagues (2020) found that career dissatisfaction may trigger job crafting efforts, and thus promote a proactive, work-related response to dissatisfaction in employees, depending on employees' level of occupational self-efficacy and social support by supervisors and colleagues. Career dissatisfaction can thus motivate individuals to engage in self-initiated work efforts to improve the situation (Berg et al., 2010; Tims & Bakker, 2010), and is consequently also linked to the concept of career-self-management (King, 2004).

2.4. Adaptive Career Management in Vocational Careers

As already noted above, contemporary careers are characterized by a dynamic interplay of various personal contextual factors (Sullivan & Baruch, 2009). Responding to societal shifts in work arrangements, globalization, and rapidly changing technologies, individuals have become the self-directed and flexible managers of their own careers (Wiernik & Kostal, 2019). This is not only, but especially relevant in light of technological advancements that will reshape tasks in many occupations (Arntz et al., 2016; Bessen, 2016), and, thus, transform established work designs (Parker & Grote, 2020). Early influential concepts and theoretical frameworks like the protean career (Hall, 1976, 1996) or the boundaryless career (Arthur & Rousseau, 1996) already discuss how individuals' respond to changes which make employment relationships and career patterns less predictable (Guan et al., 2019), and self-directedness in career development essential (Hirschi, 2018). The protean career is described "as one in which the person, not the organization, is in charge, the core values are freedom and growth, and the main success criteria are subjective (psychological success) vs. objective (position, salary)" (Hall, 2004, p. 4), and is characterized by autonomy, proactivity, and self-direction. Similarly, the boundaryless career involves both physical and psychological mobility (Sullivan & Arthur, 2006), where "individuals respond to decreased organizational resources by seeking resources or opportunities from outside their current employer, such as by changing employers or building an external professional network" (Wiernik & Kostal, 2019, p. 2). Both concepts emphasize individuals as free and independent career agents (Tomlinson et al., 2018) that embrace proactivity, are value driven, have a preference for psychological and physical mobility, and are self-directed in the management of their vocational behavior (Wiernik & Kostal, 2019).

Greenhaus et al. (2010, p. 12) define career self-management as "a process by which individuals develop, implement, and monitor career goals and strategies". Various theoretical frameworks and conceptual model discuss career self-management and consider it to be an adaptive, behavioral response to career development tasks (e.g., Greenhaus et al., 2010; Hirschi & Koen, 2021; King, 2004; Raabe et al., 2007). Within the context of this thesis, I will focus on the social cognitive career model of career self-management by Lent and Brown (2013). The career self-management model builds on the social cognitive career theory (Lent et al., 1994) and presents an integrative framework about how normative developmental tasks are accomplished, and how people navigate unexpected events and crisis. It includes both cognitive-person factors and contextual influences as predictors of adaptive career behaviors, like adjusting to work requirements or preparing for career-related changes and discusses outcomes of such behaviors. Specifically self-efficacy, that is the "perceived ability to manage specific tasks necessary for career preparation, entry, adjustment, or change across diverse occupational paths" (Lent & Brown, 2013, p. 561), and outcome expectations (i.e., beliefs about the consequences of a particular behavior) are considered important cognitive-person factors that promote adaptive career behavior. More specifically, SCCT states that self-efficacy beliefs and positive outcome expectations motivate individuals to promote adaptive career behavior (e.g., job searching behavior) both directly and indirectly through the moderating effect of personal goals that are in relation to these behaviors (e.g., obtaining a new job). As individuals are more likely to engage in adaptive career behavior if they receive environmental support for their endeavors and are free of constraining barriers (Lent & Brown, 2013), the model also takes personality traits and contextual influences into account. Contextual influences cover a wide range of possible distal (e.g., technological advancement) and proximal (e.g., support for development) supports and barriers that are important for understanding under which conditions individuals make career choices. To keep up with technological advancement, individuals' career self-management has become increasingly important for updating ones' professional skills (Hirschi, 2018). As a consequence of technological advancements, individuals need to adapt to altered tasks within their occupations (Arntz et al., 2016; Bessen, 2016) and deal with the implications for work design (see Parker & Grote, 2020), or, alternatively, pursue careers in different occupations.

2.4.1. Adopting a Control Perspective in Career Management

Humans are universally motivated to control and alter their environment (White, 1959). Although not exclusively or typically linked to the careers literature, the life span theory of control (Heckhausen & Schulz, 1995) can also be consulted as a theoretical framework for experiencing agency at work. Facing the turbulent work environment of contemporary careers (Greenhaus & Kossek, 2014), individuals' adaptive capacity to steer their development, not only in work, but also in other life domains (e.g., family, health, leisure) and across different phases of the life span is highly relevant (Heckhausen et al., 2010). The two-process model of control originally presented by Rothbaum et al. (1982) distinguishes primary and secondary control strategies. Primary control refers to "attempts to change the world so that it fits the needs and desires of the individual" (Heckhausen & Schulz, 1995, p. 285), whereas secondary control strategies are defined as changing the self to be in line with the environment. Although the theory emphasizes the functional primacy of primary control, individuals use both processes to optimize their sense of control, to maximize the overall ability to influence important outcomes, and to be adaptive in their development (Heckhausen et al., 2010; Heckhausen & Schulz, 1995). More specifically, secondary control strategies are assumed to relate to internal, motivational processes to minimize losses, and expand existing levels of primary control. The adaptive potential of secondary control strategies becomes apparent when primary control goals become unattainable, and individuals, thus, disengage from it while maintaining a sense of personal agency. Control strategies are considered as functional and adaptive if they optimize an individuals' long-term capacity for primary control across multiple life domains (Heckhausen et al., 2010).

Also adopting a control theory perspective, Direnzo and Greenhaus (2011) suggest that turnover may represent an adaptive, self-regulating, goal-oriented process. In their model, they build on the concept of employability, defined as "an individual's chance of a job on the internal and/or external labor market" (Forrier & Sels, 2003, p. 106), which is essential in a volatile economy (Grote & Raeder, 2009; Wittekind et al., 2010). Experiencing a negative discrepancy between ones' current and desired employability, individuals are motivated to reduce this discrepancy, which may eventually lead to "self-directed job mobility" (Grote & Raeder, 2009, p. 220), that is, voluntary turnover (Direnzo & Greenhaus, 2011). Thus, adopting a control perspective when studying adaptive career management could enhance our understanding of occupational career trajectories.

3. The Present Thesis

The present thesis was carried out along the lines of a research project funded by the Swiss State Secretariat for Education, Research, and Innovation (SERI), and, therefore, has a strong focus on the Swiss VET system. Because the specifics of apprenticeship systems impact relevant career related variables (Cohen, 2007) and all three scientific papers draw on VET samples, I will first provide a brief description of the Swiss VET system. Second, I will continue to outline the research aim of this thesis alongside the research aims of the three scientific papers. Third, I will describe the methodological approaches applied, and provide a summary of the three scientific papers that form this thesis.

3.1. The Swiss VET System as a Research Context

In Switzerland, pupils enter upper secondary education after nine years of compulsory school. The young adults can choose between general education programs preparing for further education on tertiary level, and VET. About two-thirds of all young people in Switzerland enroll in VET programs (SERI, 2021), which provide a solid foundation in one of about 240 occupations. Following a dual-track approach, occupation-specific skills are acquired and certified in a part-time apprenticeship at a host company, and a part-time classroom instruction at vocational schools (Ebner et al., 2013). Graduating from VET allows for further education and training on tertiary level at any given time in later career as the high flexibility and permeability of the education system, allow for diverse vocational career paths among VET graduates. Yet, the strong link between the labor market and the educational system creates a low transferability of occupation-specific human capital (Grunow & Mayer, 2007). Thus, because the educational content is specific for every VET occupation (Eggenberger et al., 2018), occupational mobility is particularly costly (Blau, 2007). Nevertheless, VET successfully addresses both the needs of young adults transitioning from school to work, and employer needs, and is, therefore, considered as the "gold standard in vocational education and training" (Hoffman & Schwartz, 2015, p. 19).

3.2. Research Aims

With the present thesis, I aim to contribute to a better understanding of occupational mobility in contemporary career trajectories. As outlined in the previous sections, occupations are considered important points of orientation in career trajectories (Carless & Arnup, 2011), especially in light of destabilized organizational affiliations (Currie et al., 2006; Dierdorff, 2019). Therefore, it is important to learn more about how occupational career trajectories unfold. To this aim, together with my coauthors, I conceptualized three scientific papers that form the basis of this dissertation. The paper cover the formative phase of vocational preparation during VET, analyze strategies of occupational stability maintenance in later employment, and assess success factors for sustained occupational stability.

Recently, Anteby et al. (2016) suggested that occupations can be understood through the three analytical lenses "becoming", "doing", and "relating". The first lens, "becoming", targets the transformation of newcomers becoming socialized into an occupation through adopting a particular set of values and norms. The focus of this lens thus lies on the entry into an occupational reality. The second lens, "doing", emphasizes the agency of occupational members and relates to how the performance of occupation-specific activities impacts career outcomes like occupational identity, or meaningfulness. Furthermore, the lens also relates to how individuals reframe and adapt occupational practices as a response to changes within their occupations, for instance due to technological advancement (Nelson & Irwin, 2014). The third lens, "relating", focusses on the relations and collaborations between occupations and their surrounding ecosystem, involving different stakeholders like clients, other occupational groups, or technology. It also emphasizes how "occupations are increasingly constituted by and mutually dependent upon their relation with technology to perform their work" (Anteby et al., 2016, p. 217).

Conceptually, the three dissertation studies can be structured according to the three analytical lenses. Combined, the studies aim to expand our knowledge of occupational mobility in vocational career trajectories and give recommendations on how involuntary mobility can be addressed. In Figure, I provide a conceptual overview of the three scientific papers, present key variables, and link the studies to the respective analytical lens as proposed by Anteby et al. (2016).

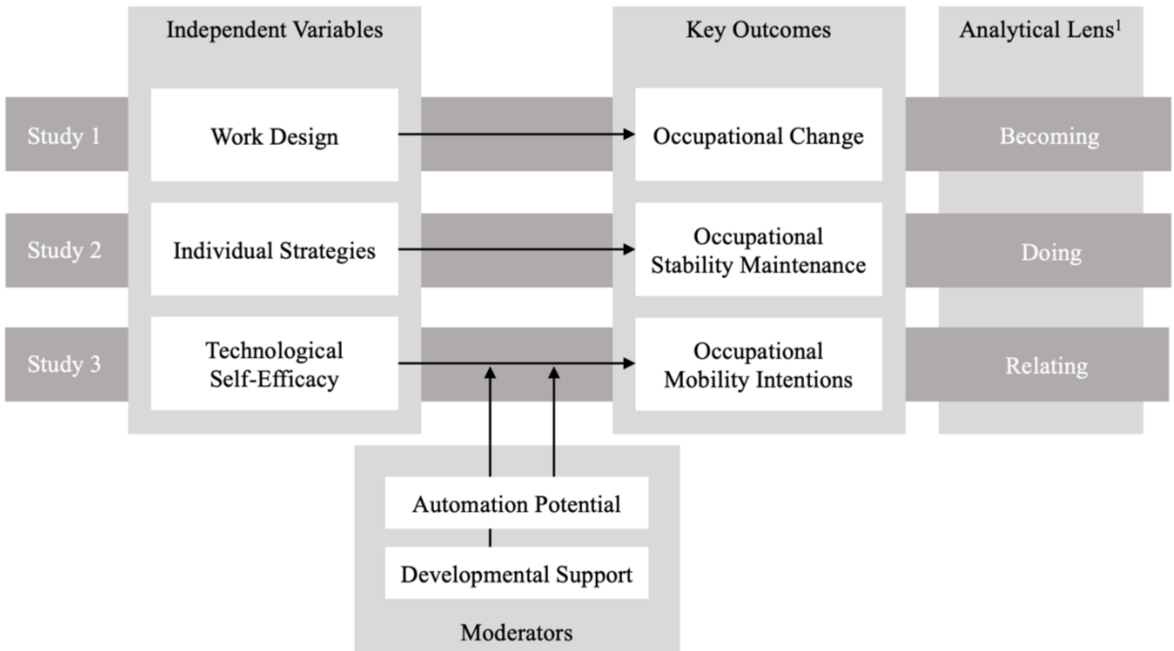

Figure 1. Conceptual overview of the three scientific papers.
[1]Analytical lens as proposed by Anteby et al. (2016).

The first dissertation study can be understood through the "becoming" lens. With this study, I aim to expand our knowledge on how occupation specific work design impacts whether the socialization into an occupation is successful in terms of sustained occupational stability. More specifically, I analyze the impact of work design during VET and in later employment on occupational change. Using the job characteristics model by Hackman &

Oldham (1976) as the key theoretical framework, the aim of the study is to examine the relevance of work experiences during the formative period of VET for occupational identity and career development in vocational careers, over and above later work experiences.

The second dissertation study can be understood through to the “doing” lens, as I aim to learn more about people do to maintain occupational stability throughout their careers while responding to manifold changes. To investigate individual strategies that promote occupational stability maintenance, I follow a qualitative approach to explore the process of occupational stability maintenance, connecting job crafting theory (Wrzesniewski & Dutton, 2001) and the life-span theory of control (Heckhausen & Schulz, 1995).

Finally, the third dissertation study can be understood through to the “relating” lens. Given the fundamental and ubiquitous changes due to technological development, I aim to advance our understanding of individual and contextual success factors of adaptive career decisions in today’s dynamic world work. Drawing on social cognitive career theory (Lent et al., 1994, 2002; Lent & Brown, 2013), I examine the relevance of technological self-efficacy for the prediction of occupational mobility intentions, through the mediating role of occupational commitment, while also taking the automation potential of ones’ occupation and developmental support by supervisors into account.

3.3. Methodological Approaches

As introduced earlier, this thesis is aimed at gaining insights into how individuals “become” socialized with an occupation, what they “do” to remain within their occupations, and how their occupational mobility “relates” to contextual factors like technological advancement (Anteby et al., 2016). To this aim, I applied both quantitative and qualitative methodological approaches and combined different research settings to provide suitable contextual frameworks for studying the proposed relationships. While study one and two have a strong focus on the Swiss VET system and were thus conducted with participants in Switzerland only, study three was not as strictly focused on VET, and included participants from Switzerland and Germany. Yet, by incorporating a quota for VET graduates in study three, we ensured that our findings would nevertheless represent the specifics of the dual-track vocational systems in Switzerland and Germany, respectively. Table 1 provides an overview of the study designs, samples, and analytical approaches used in the three papers.

Table 1

Methodological approaches of the three scientific papers

Paper	Study design	Sample	Main study variables	Analytical approach
1	Quantitative panel survey study, covering 10 years	*N* = 902 VET graduates in Switzerland	Job variety, autonomy, strain, opportunities for career development, VET satisfaction, work satisfaction, occupational change	Linear and binary logistic regression analyses, using bootstrapping to test indirect effects (mediation model)
2	Qualitative interview study (semi-structured interviews)	*N* = 32 employees in VET occupations in Switzerland	Career choice, evaluation of work experiences, reasons for staying in the trained VET occupation	Summarizing qualitative content analysis with inductive category development
3	Quantitative two-wave online survey study, complemented with task based automation potential of occupations	*N* = 660 employees in Switzerland and Germany	Technological self-efficacy, occupational commitment, occupational mobility intention, automation potential, developmental support by supervisor	Path analyses, using bootstrapping to test the full moderated mediation model

3.3.1. Study Designs and Analytical Approaches

To address the three analytical lenses by Anteby (2016), I draw on different study designs and analytical approaches in the three dissertation studies. In study one, my co-authors and I investigated how satisfaction with the trained occupation and work design in VET occupations influence occupational change, applying the “becoming” lens. To understand how work design features impact the socialization into an occupation in terms of sustained occupational stability, we used data from 905 participants of a large, representative panel study, which follows school leavers in their post-compulsory educational and vocational pathways. The longitudinal design allowed us to learn about the long-lasting impact of work experiences during vocational preparation and capture actual occupational change, not intention to change, up to ten years after graduating from VET. Furthermore, it also allowed us to compare the influence of these early work experiences with those from later career trajectories. We analyzed the panel data using multiple linear and binary logistic regression analyses and tested the mediation model using bootstrapping, based on the recommendations of Preacher and Hayes (2008).

In study two, my co-authors and I explored how individuals maintain occupational stability throughout vocational careers, facing the turbulent work environment of contemporary careers (Greenhaus & Kossek, 2014). Applying the “doing” lens, we performed a qualitative study to learn more about the process of occupational stability maintenance. We applied a stratified sampling process (Robinson, 2014) and created a sample including participants from eight different occupations, representing the eight occupational divisions offered in the Swiss Standard Classification of Occupations (Federal Statistical Office, 2014). The interview data was analyzed using summarizing qualitative content analysis (Mayring, 2014) with inductive coding, which includes open coding, creating categories by collapsing similar codes, and formulating generalized concepts through abstraction (Elo & Kyngäs, 2008). In a stepwise reduction of the material, we discussed meaningful paraphrases within the research team and grouped them into higher order categories, which were then arranged into generalized concepts. Following this rule-bound procedure (Bechky & Okhuysen, 2011; Miles & Huberman, 1984), we created a category system and a coding manual.

Lastly, in study three, my co-authors and I investigated the influence of technological self-efficacy beliefs on occupational mobility and tested whether occupational commitment mediated this relation. Applying the “relating” lens, we included developmental support and the automation potential as moderating contextual variables in the study design . We conducted an online survey with two data points in time with a time lag of about four weeks, using the services of a panel provider[1]. The self-report survey data was complemented with the objective automation potential for each occupation, following the task based approach by Dengler and Matthes (2018). Combining survey data and the automation potential of occupations in our analysis allowed us to examine subjective and objective contextual influences for adaptive career behavior and decision making. To test the proposed moderated mediation model, we performed bootstrapping for the indirect conditional effects using the PROCESS macro for SPSS 26 (Hayes, 2013). This procedure allowed us to analyze all hypotheses simultaneously.

[1] Talk Online Panel GmbH, Vienna, Austria

3.4. Summary of Scientific Papers

In the following chapter, I provide a brief summary of each of the three scientific papers which form the present thesis. The summaries outline the individual research aim and theoretical background, methodology, main findings, and contributions for each paper. Table 2 specifies my contributions as the first author and provides an overview about the publication status and target journals.

Table 2

Publication status of scientific papers and author contributions

Paper	Title	Authors	Journal (status)	PhD candidate's contribution[a]
1	Grass roots of occupational change: Understanding mobility in vocational careers	Guri Medici Cécile Tschopp Gudela Grote Andreas Hirschi	Journal of Vocational Behavior (*published*)[b]	• Conceptualization • Methodology • Formal analysis • Writing - Original Draft • Writing - Review & Editing
2	Facing change with stability: The dynamics of occupational career trajectories	Guri Medici Ivana Igic Gudela Grote Andreas Hirschi	Journal of Career Development (*submitted*)[c]	• Conceptualization • Project administration • Methodology • Formal analysis • Investigation • Resources • Writing - Original Draft
3	Technological self-efficacy and occupational mobility intentions in the face of technological advancement: A moderated mediation model	Guri Medici Gudela Grote Ivana Igic Andreas Hirschi	European Journal of Work and Organizational Psychology (*submitted*)[d]	• Conceptualization • Project administration • Methodology • Formal analysis • Writing - Original Draft

[a] Description based on CRediT (Contributor Roles Taxonomy)
[b] Medici, G., Tschopp, C., Grote, G., & Hirschi, A. (2020). Grass roots of occupational change: Understanding mobility in vocational careers. *Journal of Vocational Behavior*, *122*, 103480. https://doi.org/10.1016/j.jvb.2020.103480
[c] A previous version of this paper has been accepted for and presented at the 80th Annual Meeting of the Academy of Management (AOM), a virtual experience. https://doi.org/10.5465/AMBPP.2020.13837abstract
[d] A shortened version of this paper has been accepted for the 38th European Group for Organizational Studies Colloquium (EGOS), Vienna, Austria.

Paper 1

Grass roots of occupational change: Understanding mobility in vocational careers

Guri Medici, Cécile Tschopp, Gudela Grote, & Andreas Hirschi

The aim of the first scientific paper was to investigate the effect of the formative experience during VET for later career trajectories. Although career mobility has become a rather common phenomenon of today's careers (Ahn et al., 2017; Carless & Arnup, 2011), research, however, mostly discusses mobility across jobs and organizational boundaries (Rodrigues & Guest, 2010). Studies explaining occupational change are still scarce (Carless & Arnup, 2011). Because occupations are considered important points of orientation in career trajectories, it is important to understand this increasingly relevant, but understudied form of career mobility (Anteby et al., 2016; Carless & Arnup, 2011).

Formal education, such as VET, implies high human capital investment (Becker, 1962), which is not fully transferable to other occupations (Kambourov & Manovskii, 2008). Thus, occupational change is a costly, major transition (Blau, 2007), especially in the context of VET, where human capital is carefully built during the apprenticeship years (Eggenberger et al., 2018). Since the apprenticeship model has recently gained traction (Smith & Kemmis, 2013; World Bank, 2019), and the broad unrealized potential for many occupations has been demonstrated (Fuller & Sigelman, 2017), it is timely to understand the process of occupational change for VET occupations. Research shows that individuals are less likely to leave their occupations after investments in specific training (Shniper, 2005). Therefore, the satisfaction with the trained occupation (VET satisfaction) is especially important for understanding vocational career trajectories. Furthermore, as work design impacts many highly relevant variables in the field of psychology (Parker, 2014), it is likely to also play an important role for understanding occupational change. Nevertheless, work design has been neglected as a focal predictor in prior studies.

We addressed this gap in the first scientific paper by examining the impact of work characteristics during vocational preparation and VET satisfaction on occupational change and compared the influence of these factors to work satisfaction and satisfaction with work characteristics in later employment. Connecting work design and career research, we hypothesized that work characteristics experienced during VET would impact VET satisfaction and occupational change. More specifically, we used job variety, autonomy, strain, and perceived opportunities for career development during VET as predictors for VET satisfaction and assumed that VET satisfaction would predict occupational change up to ten years after graduating from VET. Additionally, we assumed that VET satisfaction mediated the relation between VET work characteristics and occupational change. As we aimed to investigate also the importance of the formative VET context (Frese, 2008) for career trajectories, we included also more proximal predictors of occupational change, that is work characteristics and work satisfaction in later employment, prior to change.

Addressing prior methodological shortcomings, we combined different quantitative methods, testing a longitudinal mediation model based on panel data with actual occupational change, not turnover intentions, as outcome variable. Our sample consisted of 902 VET graduates for whom we had information from VET and later employment, ten years after graduating from VET. Supporting our hypotheses, results indicated that early, occupation specific work experience had a strong impact: Work characteristics from VET predicted satisfaction with trained occupation which in turn predicted occupational change, up to ten years after finishing VET. VET satisfaction mediated this relation. The same effects were observed for work characteristics and work satisfaction during later career, tested with a subsample. Furthermore, also after including the more proximal predictor of work satisfaction, VET satisfaction remained a significant predictor of occupational change, up to ten years after graduating from VET. With this study, we demonstrated the relevance of work characteristics during VET, and VET satisfaction as predictors of occupational change. Our findings show that work-related experience made during the formative phase of occupational identity development (Skorikov & Vondracek, 1998), has a long lasting effect on career decisions, over and above later employment.

Paper 2

Facing change with stability: The dynamics of occupational career trajectories

Guri Medici, Ivana Igic, Gudela Grote, & Andreas Hirschi

The aim of the second scientific paper was to explore the process of occupational stability maintenance in vocational careers. As rapid social, economic and technological changes are typical for contemporary careers (Greenhaus & Kossek, 2014), individuals increasingly need to adapt to altering work environments throughout their career trajectories (Jansen & Shipp, 2019). Furthermore, as these changes impact the applicability of previously established skills, individuals must engage in personal development throughout their whole careers (Van der Heijden et al., 2016). In this dynamic work environment, occupations are assumed to fill the void of destabilized organizational affiliations (Currie et al., 2006; Dierdorff, 2019), and research consequently shows that occupational stability is still frequent (e.g., Zimmerman et al., 2020). Moreover, occupational change is costly in light of occupational identity and human capital investments which are at least partially lost when entering a new occupational domain (Feldman & Ng, 2007; Kambourov & Manovskii, 2008). It is, therefore, timely to understand how stable vocational career trajectories unfold in today's dynamic world of work.

To address this question, we explored the process of occupational stability maintenance in a qualitative interview study with 32 employees who stayed in the occupations they had been trained in throughout their careers. More specifically, we wanted to learn what people do and which strategies they use to successfully manage the continuous adjustment process between the individual and the changing work environment to sustain fit with their occupation. Summarizing qualitative content analysis revealed that occupational stability maintenance occurred through the dynamic combination of eight distinct, but interconnected strategies. Participants, for example, described how they constructively dealt with change in their occupations, also due to technological advancements, or how they actively used resource spillover and adjusted role demands across different life domains. Moreover, the reinforcement of one's occupational attachment, benefitting from social relations, or the promotion of personal and professional development were used to maintain occupational stability. Leaning on job crafting theory (Wrzesniewski & Dutton, 2001), and the life span theory of control (Heckhausen et al., 2010), we found that the strategies were used to craft fit with their occupations, either by reactively adjusting to work, or by proactively changing it, using both primary and secondary control strategies for occupational stability maintenance.

With this study, we make two important contributions. First, we introduce the concept of occupational crafting and describe how both primary and secondary control strategies are needed for adaptive career development, and management. Thereby, we combine literature on job crafting and the life-span theory of control and demonstrate their relevance for contemporary vocational careers.

Second, to the best of our knowledge, our study investigates the process of occupational stability maintenance for the first time and highlights the relevance of occupations for individual career management. Following the call to adopt occupational lens in organizational psychology scholarship (Dierdorff, 2019), we show that seemingly stable careers include both stability, for instance through organizational stability, and change, for instance when adapting to changes in work requirements, and describe how the proactive and reactive use of the identified strategies jointly contribute to occupational stability in vocational careers.

Paper 3

Technological self-efficacy and occupational mobility intentions in the face of technological advancement: A moderated mediation model

Guri Medici, Gudela Grote, Ivana Igic, & Andreas Hirschi

The aim of the third scientific paper was to investigate how individual and contextual factors influence occupational mobility intentions in light of technological advancement. While it is expected that new technologies will affect a wide variety of tasks across virtually all occupations (Brynjolfsson et al., 2018; Frank et al., 2019), a clear understanding of how these developments impact individuals' career trajectories is currently lacking. Because technological advancement will impact virtually all occupations (Frank et al., 2019), occupational change cannot be considered an adaptive response to transformed work environments and outdated individual skill sets.

Based on social cognitive career theory (Lent & Brown, 2013), we assumed that technological self-efficacy (TSE) acts as a specific cognitive person factor, which impacts occupational mobility intentions both directly and through the mediating role of occupational commitment. More precisely, we hypothesized that individuals with high TSE are ready to adapt to technology-induced changes in their occupations, leading to sustained occupational commitment, and low occupational mobility intentions. We further proposed that the objective occupational automation potential (AP), and perceived development support by supervisors would act moderators in the model: First, we assumed the negative relation between TSE and occupational mobility intentions to be stronger for high AP occupations because it renders TSE more relevant for being successful in one’s occupation. We also assumed the positive relation between TSE and occupational commitment to be stronger for high AP occupations, as people with high TSE thrive in the altered work environment and will, therefore, be more committed to their occupations. Second, because development support by supervisors is crucial for adaptive career-related behavior (Lent & Brown, 2013), we further hypothesized that development support alleviates the negative relation between occupational commitment and occupational mobility intention by encouraging professional development. Finally, we proposed a partially moderated mediation of TSE on occupational mobility intentions through occupational commitment, in that the mediation effects are stronger under the conditions of high AP, and high developmental support.

We conducted a, online survey study to investigate the proposed relations in a sample of 512 employees across different occupations at two data points. We complemented the survey data with the objective AP for each occupation using the online tool by Dengler and Matthes (2018)[2] which indicates the potential to substitute occupational tasks by technology already available today. Supporting our hypotheses, the results of our moderated mediation analysis revealed that TSE was negatively related to occupational mobility intentions, and that occupational commitment partially mediated the relationship between TSE and mobility intentions. Conversely to our assumptions, the negative relationship between TSE and occupational mobility intentions was stronger, when AP was low (not high). Moreover, AP did not moderate the relation between TSE and occupational commitment. Supporting our hypothesis, development support further weakened the negative relation between occupational commitment and occupational mobility intentions.

Our study provides first evidence of the relevance of TSE as a relevant person-specific factor for adaptive career management. Furthermore, although in part contrary to our hypotheses, we found that AP and development support are important contextual variables that influence how TSE and occupational commitment relate to occupational mobility intentions. We thereby provide new empirical insight on how technological advancement

[2] https://job-futuromat.iab.de/

impacts occupational mobility intentions. Our findings imply that promoting TSE in employees and providing development support is crucial for empowering employees in dealing with changing work environments and sustaining their occupational stability.

4. General Discussion

With the present thesis, I aim to contribute to a better understanding how occupational career trajectories unfold. To this aim, together with my coauthors, I conceptualized three scientific papers that shed light on work design implications during the formative phase of vocational preparation for occupational career trajectories, the process of occupational stability maintenance, and on personal and contextual success factors for adaptive, and sustainable occupational career trajectories. Throughout all three dissertation studies, I emphasize the importance of occupations as stabilizing elements of contemporary careers (Dierdorff, 2019) in light of various social, economic, and technological changes (Greenhaus & Kossek, 2014). These changes impact and alter established work designs of occupations (Parker & Grote, 2020), challenge the applicability of established skills and call for personal development throughout the whole career (Van der Heijden et al., 2016), and, consequently, make individual career management highly relevant (Hirschi, 2018). As research on occupational mobility is generally scarce and called for (Anteby et al., 2016; Carless & Arnup, 2011; Dlouhy & Biemann, 2018), the findings of the three dissertation studies provide meaningful insights into specific personal and contextual factors which contribute to a better understanding of the dynamics of occupational career trajectories.

In the following chapter, I will first present and discuss the key findings and theoretical implications of the three dissertation studies. Second, I will provide ideas on how occupational associations, organizations, and individuals could transfer the findings into practice. Third, I discuss the limitations of the studies, and thus, this thesis, and provide avenues for future research. Finally, I will present a short conclusion regarding the contribution of this thesis in the last part of this chapter.

4.1. Theoretical Implications

With my first dissertation study, I contribute to a better understanding of the impact of work characteristics experienced during vocational preparation for later career development. The study connects literature on work design, and occupational mobility in vocational careers. Leaning on the seminal job characteristics model by Hackman and Oldham (1976), the impact of work design on occupational mobility through the mediating role of work satisfaction seems evident, but has never been explicitly addressed in prior research. Supporting our hypotheses, we found that work characteristics during VET predicted the satisfaction with the VET occupation, which in turn predicted occupational change, up to ten years after graduating from VET. We also found the same relationships in later employment. This finding supported both our hypotheses, as well as prior, untested theoretical assumptions (Rhodes & Doering, 1983). The findings of this study thus reinforce the importance of work design theory not only for individuals and organizations (Parker, 2014), but also for occupations, and demonstrates that work experiences made during the formative phase of occupational identity development in VET (Skorikov & Vondracek, 1998) are highly relevant for vocational career trajectories. In summary, the findings of the first dissertation study highlight that the successful transformation into an occupation, captured by the "becoming" lens presented by Anteby and colleagues (2016), also depends on the specifics of work design during the formative years of vocational preparation, and how satisfied apprentices are at the end of their VET, when entering the occupational reality. Consequently, VET can be considered as an important framework for the development of a sustained occupational identity (Skorikov & Vondracek, 2011), and, for understanding occupational mobility in vocational careers.

My second dissertation study contributes to a better understanding of occupational stability maintenance in vocational careers by adopting a qualitative approach, drawing on theoretical considerations from job crafting literature (Wrzesniewski & Dutton, 2001), and the life-span theory of control (Heckhausen et al., 2010). Specifically, the findings of the study imply that occupational stability is maintained through the dynamic interaction of eight distinct, yet interconnected strategies, that sustain and preserve participants' occupational identity, and prevent potential human capital loss due to occupational mobility. Adopting a "doing" lens on occupations as suggested by Anteby and colleagues (2016), we found that agency is indeed important for sustainable vocational career trajectories. Accordingly, our findings revealed that participants engage in occupational crafting, defined as the proactive use of strategies and behaviors to achieve, and maintain occupational stability in a continuous adjustment process. Occupational crafting can, in parts, be understood as a form of primary control, that is the shaping of ones' work according to individual interests, skills, and abilities (Heckhausen et al., 2010). Yet, to accomplish occupational stability throughout the career, adapting to situational demands by engaging in secondary control strategies whenever primary control could not be exerted, as proposed by Heckhausen and colleagues (2010), was also essential. With this dissertation study, we explicitly demonstrate the applicability of the life span-theory of control (Heckhausen et al., 2010) for adaptive career management in contemporary vocational careers, and present an integrative approach for understanding the dynamics of stable occupational career trajectories.

Finally, with my third dissertation study, I contribute to a better understanding of personal and contextual success factors of adaptive career decisions. The study introduced technological self-efficacy as an important person-related construct and explored its incremental validity for adaptive career management. Using social cognitive career theory (Lent et al., 1994, 2002; Lent & Brown, 2013) as a theoretical framework, we addressed how technological self-efficacy beliefs, and occupational commitment relate to occupational mobility intentions. Supporting our hypotheses, we found that technological self-efficacy and occupational commitment were negatively related to mobility intentions, and that commitment partially mediated the relationship between technological self-efficacy, and mobility intentions. Applying the "relating" lens introduced by Anteby and colleagues (2016), this dissertation study advances our understanding of how technological advancement impacts contemporary careers. We introduced technological self-efficacy beliefs for the prediction of occupational mobility intentions and found the objective automation potential of one's occupation, and developmental support by supervisors to be relevant contextual variables for explaining occupational mobility intentions. The study thus demonstrates the relevance of technological self-efficacy and developmental support by supervisors for adaptive career management in the work of the future.

Together, the findings of the three dissertation studies reinforce the role of occupations for understanding individual career trajectories. Adopting an occupational lens in career research highlights how educational systems can be meaningful for understanding vocational behavior, and for the formation of sustained occupational commitment and occupational identity. The perspective furthermore informs research on the long lasting effect of work design features for major career decisions, like occupational mobility, and thus stress the importance of the respective theoretical assumptions also for occupational careers. Additionally, the findings emphasize that both reactive and proactive behaviors, like the introduced concept of occupational crafting, are relevant for sustainable occupational career trajectories, and not just for organizational outcomes. Finally, also for understanding how individuals navigate their careers in light of technological advancement, adopting an occupational lens allows to explore the influence of proximal and distal contextual variables for adaptive career self-management.

4.2. Practical Implications

Sustaining individuals' occupational stability is of high practical relevance, not only for the individual in term of occupational identity and specific human capital investments (Blau, 2007; Feldman & Ng, 2007; Skorikov & Vondracek, 2011), but also for the broader society, in terms of investments in educational systems (Becker, 1962; Brett, 1980). This is especially the case for countries where VET is the first choice for a majority of school graduates transitioning into the world of work, like Switzerland (SERI, 2021). As "the utility of research depends on whether it makes a contribution […]" (Antonakis, 2017, p. 5), I will present relevant practical implications on how to foster occupational stability, and prevent involuntary occupational change in occupational career trajectories, derived from the three dissertation studies presented in this thesis.

The findings from the first dissertation study inform practitioners on the relevance of high quality work design already during vocational preparation. The work related experience apprentices' make in VET during the formative phase of occupational identity development (Skorikov & Vondracek, 1998) substantially impacts individual career trajectories. As work characteristics during VET impact apprentices' overall satisfaction with the training occupation, and occupational mobility (Medici et al., 2020), VET should be designed according to the fundamental assumptions of work design research (Parker et al., 2017). Specifically, job variety, opportunities for development, and strain should be carefully considered during apprenticeships. Although autonomy was not relevant for predicting VET satisfaction in our study, it should nevertheless be taken into account when designing high quality VET, and post graduate employment. In line with prior findings on the practical relevance of stress and exhaustion on occupational commitment and occupational change (Blau, 2007; Major et al., 2013), we found that strain directly predicted occupational change in employment after graduating from VET. This finding implies that strain needs to be carefully monitored, as it represents an important lever for change across a broad range of occupations.

The findings from the second dissertation study provide insights on how individuals navigate their careers within the boundaries of one occupation in light of manifold internal and external influences, by using both proactive and reactive strategies of occupational stability maintenance. Informed by these strategies, our findings imply that individuals' occupational stability can be supported through different avenues. First and foremost, work environments should allow for occupational crafting, satisfying the fundamental need for exercising control in shaping work according to their interests, skills, and abilities (Heckhausen et al., 2010). Yet, as with job crafting, occupational crafting can only be indirectly affected through providing stimulating work environments (Wrzesniewski & Dutton, 2001). Consequently, organizations and supervisors are encouraged to provide sufficient leeway for personal development and allow for sustainable careers within VET occupations. For individuals, our findings imply that actively engaging in occupational crafting is beneficial, as it optimizes their sense of control, creates a positive self-image, and creates meaningful interaction with others. Thus, individuals could, for instance, become engaged as apprenticeship trainers or expand their career potential through further education. Further education can also be useful considering the development of occupation specific knowledge and skills, that have been altered due to changes in the occupations itself. Consequently, occupational associations could offer specific, low level continued education programs, that address such changes and their implications for daily work.

Finally, the third dissertation study provides first propositions of how individuals could be enabled to adaptively deal with changing work environments, fostering their occupational stability, and preventing involuntary, and costly occupational mobility (Feldman & Ng, 2007; Kambourov & Manovskii, 2008). Self-efficacy beliefs are malleable and can be formed through learning experiences (Sheu et al., 2018). With regards to technological self-efficacy, our findings imply that through the provision of adequate learning opportunities within organizations, occupational associations, or in continued education, individuals' beliefs to successfully perform a new, technologically sophisticated task (McDonald & Siegall, 1992) can be fostered. Strengthening individuals' technological self-efficacy beliefs facilitates the acceptance and intention to use technology (Celik & Yesilyurt, 2013) within their occupations. According to our findings, promoting employee's technological self-efficacy is particularly important in occupational contexts that offer some technology-induced change, but are not at risk for being fully substituted by technology. With regards to contextual supports of adaptive career management, supervisors are encouraged to create learning oriented work environments that support the adaptive developmental capacity of employees.

4.3. Limitations and Avenues for Future Research

As all empirical studies, the three scientific papers presented in this thesis have limitations. Two general limitations affect all three dissertation studies. Within this section, I present the general limitations of this thesis, briefly describe the specific limitations of each study, and provide ideas how these limitations could be addressed in future research.

The first limitation that spans all three dissertation studies is related to the generalizability of the findings. As the first two dissertation studies were explicitly conducted with a strong emphasis on the Swiss VET context, I expect that the findings do not directly transport to other educational systems, cultural contexts, and labor markets. While appropriate for the purpose of the studies, future research could, as a first step, validate our findings in other countries that also have work-based apprenticeship systems, such as Austria, Denmark, or the Netherlands (Wolter & Ryan, 2011). The second general limitation concerns common source and common method bias. With the exception of the objective automation potential included in the third dissertation study, alle measures are self-reported, and, in the case of the qualitative study, based on participants' subjective narratives. Additionally, the third dissertation study used the services of a panel provider and only included two measurement points. Thus, future studies would benefit from improved longitudinal study designs that allow to study the proposed relationships more thoroughly and include measures from more than one data source.

Specific to the first dissertation study, the main limitation concerns attrition bias for the presented subsample, as nonrandom sampling was observed for some variables. Favoring occupational stability, participants in the subsample reported higher levels of VET satisfaction and were more likely to stay in their VET occupation. Furthermore, the study was limited to a narrow set of work related predictors of VET, and work satisfaction, and did neither include changes in work satisfaction over time, nor account for personal or contextual influences on career trajectories. To advance our understanding of the impact of formative experiences during VET for occupational mobility, future studies could address these limitations in providing more comprehensive, longitudinal study designs, including person-specific traits, and external influences as additional predictors of occupational change.

The specific limitations of the second dissertation study are primarily related to the generalizability of the results. With the clear connection to the Swiss VET system, as outlined above, the findings might not transfer to other contexts. Because we aimed to generate deep insight into the process of occupational stability maintenance in vocational careers, the study relied on participants retrospective understanding and recollection of events, decisions, and actions. This allowed participants to highlight internal explanations of their own behavior, neglecting contextual and personal boundary conditions. Consequently, future studies could focus on such and validate the identified strategies of occupational stability maintenance within a large, cross-cultural sample.

The specific limitations of the third dissertation study consider the use of a panel provider, as earlier mentioned. Furthermore, we used occupational mobility intentions as a proxy for actual mobility. Although occupational mobility intentions are still frequently used for studying career choices (e.g., Li et al., 2019), future studies should test whether technological self-efficacy, and occupational commitment predict actual occupational change, and how automation potential, as well as developmental support impact this relation. Finally, we introduced the objective automation potential of occupations, neglecting the subjective evaluation of technological advancement for individual career development. Future studies could include both subjective and objective measures, and thereby provide a more comprehensive understanding of factors that influence occupational mobility in the work of the future.

4.4. Conclusion

Within this dissertation, I analyzed the impact of work design experienced during vocational preparation on later occupational change, explored strategies of stability maintenance in vocational careers, and studied how technological self-efficacy beliefs influence occupational mobility intentions. Connecting different literature streams, I provide empirical evidence for the relevance of work design features for sustained occupational stability in vocational careers, provide deep insight into the proactive and reactive strategies of occupational stability maintenance, and, finally, advance our understanding of relevant personal and contextual factors for occupational mobility intentions in the work of the future. Informed by the findings of the three dissertations studies, this thesis contributes to a better understanding of the dynamics of occupational career trajectories and informs both research and practice on how occupational stability can be promoted, also in today’s dynamic work environments.

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Part II

The three scientific papers are presented as self-contained articles including their own structure, numbering of tables and figures, and references.

1. Scientific Paper I[3]

Grass Roots of Occupational Change: Understanding Mobility in Vocational Careers

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Abstract

Most prior research on career mobility has focused on people changing jobs and organizations. We know little about processes involved in individuals changing occupations, although these changes cause high individual, organizational, and public costs. Moreover, occupations are increasingly acknowledged as important anchors in times of more boundaryless careers. The current study investigates the impact of early satisfaction with the trained occupation (VET satisfaction) on occupational change by analyzing 10-year longitudinal panel data gathered in Switzerland ($N = 905$). Results from regression analyses showed that VET satisfaction predicted occupational change up to ten years after graduation. VET satisfaction in turn was affected by work characteristics experienced during VET, and VET satisfaction mediated the relationship between work characteristics during VET and occupational change. Using a subsample ($N = 464$) for which data were available on jobs taken up after graduation, we showed that VET satisfaction explained occupational change over and above work satisfaction in jobs held after graduation, highlighting the formative role of early experience during VET. Our findings inform both theory and practice. To fully

[3] This is the peer reviewed, unedited version of the following article: Medici, G., Tschopp, C., Grote, G., & Hirschi, A. (2020). Grass roots of occupational change: Understanding mobility in vocational careers. *Journal of Vocational Behavior*, *122*, 103480. https://doi.org/10.1016/j.jvb.2020.103480. In accordance with the publisher, Elsevier Inc., this article may be used for non-commercial purposes.

comprehend occupational change, established turnover models also need to reflect on early formative vocational experiences. Firms should pay attention to favorable work characteristics already during VET and adjust adverse conditions to reduce undesired occupational mobility.

Keywords: vocational education and training (VET), occupational change, work design, work characteristics, work satisfaction

Introduction

Career mobility has become a rather common phenomenon and is considered a normal aspect of today's careers (Ahn et al., 2017; Carless & Arnup, 2011). Most of the respective literature discusses mobility across jobs and organizational boundaries (Rodrigues & Guest, 2010), while mobility between different occupations has rarely been addressed. Given the growing appreciation for occupations as important points of orientation in career trajectories, more knowledge on the processes involved in occupational mobility is needed (Anteby et al., 2016; Carless & Arnup, 2011). Because "occupations are institutionally defined and regulated bundles of qualifications" (Grunow & Mayer, 2007, p. 3), the change to a new occupation represents a major transition in career paths (Feldman & Ng, 2007). Such transitions or changes require individuals to learn fundamentally new knowledge and skills that need to be gained through additional training, education, or vocational preparation (Feldman, 2002). Formal education, such as vocational education and training (VET), signifies high human capital investment (Becker, 1962), which is at least partially lost when leaving one occupational domain in favor of another (Kambourov & Manovskii, 2008). Hence, occupational mobility usually comes with high costs in terms of invested time and money (Blau, 2007). These costs affect not only organizations and individuals, but also the broader society in terms of public investments in educational systems (Becker, 1962; Brett, 1980).

Human capital loss is not only problematic for occupations that require university education, but also and especially in the context of VET, where occupation-specific human capital is carefully built during several years of apprenticeship (Eggenberger et al., 2018). The apprenticeship model underlying VET has recently gained traction in an increasing number of countries and for an increasing number of occupations (E. Smith & Kemmis, 2013; World Bank, 2019). Fuller and Sigelman (2017), for instance, demonstrated the broad unrealized potential apprenticeship programs hold for many occupations in the U.S. economy. Thus, with growing interest in apprenticeship systems, it is timely to investigate the antecedents of occupational change specifically for VET occupations.

To date, there is little research on explaining occupational change (Carless & Arnup, 2011). Some prior research has focused on work-related predictors of mobility, such as job resources (De Cuyper et al., 2011), while other studies have discussed personal attributes or traits (e.g., Coder, 2007). Moreover, concepts like occupational embeddedness and boundarylessness (Howes & Goodman-Delahunty, 2015) as well as occupational commitment, uncertainty tolerance, and work satisfaction (Otto et al., 2010) have been introduced as antecedents of career mobility. Specifically work satisfaction, that is the positive evaluation of the current situation at work (Otto et al., 2010), has been shown to impact employees' willingness to change their occupations (Blau, 2000), and is considered a consistent predictor of job turnover (Rubenstein et al., 2018). However, whether specific work characteristics that precede work satisfaction impact the probability of changing one's occupation, has not yet been considered. This is astonishing as research on work design has provided ample evidence for the fundamental influence of work characteristics on work satisfaction, turnover, individuals' self-concepts, and occupational identities (Hackman & Oldham, 1976; Humphrey et al., 2007; Oyserman, 2001; Parker, 2014).

“Work design matters” (Parker, Morgeson, et al., 2017, p. 404), as it is a key antecedent of many highly relevant dependent variables in the field of psychology, including work satisfaction, well-being, absenteeism, and employee performance. Thus, because of the fundamental role work design plays in causing positive outcomes and mitigating negative ones for individuals and organizations likewise (Parker, 2014), it is most likely also important for understanding occupational change. Still, to the best of our knowledge, it has been neglected as a focal predictor of occupational change in prior studies. Learning which work characteristics contribute to people leaving the occupation they were initially trained in, and potentially accept a major loss of prior human capital investment, is therefore a critical endeavor in career mobility research.

Heeding calls to identify mechanisms involved in actual—not just intended—occupational change (Carless & Arnup, 2011; Dlouhy & Biemann, 2018), this study investigates the influence of work characteristics experienced during the years of VET, and satisfaction with the occupation trained in (VET satisfaction) on occupational change. Additionally, the relevance of the VET experience for occupational change is compared to work characteristics and work satisfaction in later employment. The contributions of our study are threefold: First, we connect work design and career research to identify factors contributing to occupational change as an increasingly relevant but understudied form of career mobility. Second, we highlight the role of individuals' VET satisfaction as a predictor of occupational change over and above later work experiences. Third, the paper addresses prior methodological shortcomings in testing a longitudinal mediation model based on panel data with actual occupational change, not turnover intentions, as outcome variable. Understanding antecedents of occupational change anchored in early work experience during VET enriches current models of career mobility and instructs practitioners on how undesired mobility can be reduced.

Occupational change in vocational careers

Occupations are characterized by specific sets of work role requirements which define the tasks to be performed, and the knowledge and skills needed to accomplish these tasks (Dierdorff et al., 2009). The rules for access to and performance within occupations are well-defined, especially for VET occupations (Grunow & Mayer, 2007). Changing the occupation implies entering a different work environment where novel skills and routines need to be acquired. In contrast, changing jobs refers to intra- or inter-organizational mobility, usually within the same occupation (Ng et al., 2007). Because human capital is often specific to the occupation in which the individual works (Kambourov & Manovskii, 2008, 2009), changing the occupation is usually costlier and less common than changing jobs while remaining in the same occupation (Longhi & Brynin, 2010; C. Robinson, 2018; P. Sullivan, 2010). Occupational mobility, or occupational change, is consequently considered a rather extreme process (Meyer et al., 1993).

To date, research on work-related predictors of actual, not intended, occupational change is very rare (Blau, 2000; Darvin, 2020). Prior research has investigated work satisfaction, job security, openness to experience, and salary as antecedents of occupational change (Carless & Arnup, 2011; Kornblum et al., 2018). Many other studies have used the intention to change occupations as a proxy for actual change, and introduced constructs like occupational commitment and embeddedness, work satisfaction, burnout, or boundarylessness as predictors (Howes & Goodman-Delahunty, 2015; Otto et al., 2010; Van der Heijden et al., 2019). Yet, learning from the job change literature, the relationship between turnover intentions and actual change is modest (Griffeth et al., 2000), and the two should not be treated as the same (Rubenstein et al., 2018). Additionally, the few existing studies examining actual change are limited to a small set of specific occupations, like nurses (Kramer & Son, 2016), providing an incomplete understanding of work-related predictors of occupational change. In our study, we follow the call to assess actual occupational change (Carless & Arnup, 2011; Dlouhy & Biemann, 2018) by analyzing the impact of work design on occupational change for a broad range of occupations.

In the current study, we investigate the importance of work characteristics experienced during VET for apprentices' satisfaction with their training occupation (VET satisfaction). More specifically, we use the work characteristics job variety, autonomy, strain, and perceived opportunities for career development as predictors for VET satisfaction. VET satisfaction is in turn used to predict occupational change up to ten years after graduating from VET. Finally, we test a mediation model, in which VET satisfaction mediates the relation between VET work characteristics and occupational change. In a second step, we include the same work characteristics and job satisfaction from later employment as more proximal predictors of occupational change to examine the relative impact of the early formative experience during VET. Considering the early impact of work design during VET, VET satisfaction, as well as experiences in later employment on occupational mobility allows for a better understanding of vocational career trajectories.

The importance of work characteristics

In the many years of work design research, work characteristics have been linked to numerous meaningful outcomes on the individual, team, and organizational level, as recent meta-analyses demonstrate (Humphrey et al., 2007; Parker et al., 2017). Work design, defined as "the content and organization of one's work tasks, activities, relationships, and responsibilities" (Parker, 2014, p. 662), is related to positive outcomes like job satisfaction, work motivation, and performance (Humphrey et al., 2007). When considering outcomes of work design, it is also important to direct attention to the occupational context which provides opportunities and boundaries of different work design features (Dierdorff & Morgeson, 2013). For instance, while some occupations generally allow for more autonomy (e.g., project manager), others are by definition more physically strenuous (e.g., construction worker). Changing the occupation can consequently lead to a sharp disruption in the experienced work characteristics as the central task characteristics change as well (Zhou et al., 2017). As there is strong evidence for the positive relationship between work characteristics and work satisfaction (Dierdorff & Morgeson, 2013; Morgeson & Humphrey, 2006; Parker, 2014), we propose that this relationship also holds true when investigating the link between work characteristics experienced during VET and satisfaction with the VET occupation (VET satisfaction). Leaning on work design research (Kulik et al., 1987), we assume that a positive evaluation of occupation-specific work characteristics results from a fit between the apprentice and their occupational environment. The on-the-job learning experienced throughout the first formative period of VET can substantially influence young adults' further career development (Frese, 1982; Worthen & Berchman, 2010). Hence, the occupational environment and the experienced work characteristics do not only affect the current work satisfaction but can also form apprentices' occupational identity over time (Ibarra, 2006; Ibarra & Barbulescu, 2010). We thus expect work characteristics experienced during the formative period of VET to shape the apprentices' evaluation of the occupation itself as they provide a realistic view on career prospects within the training occupation. Therefore, we assume that work characteristics experienced during VET also impact VET satisfaction, that is, the satisfaction with the trained occupation.

To study the postulated relationship, we focus on the following four fundamental characteristics of work: job variety, autonomy, strain, and opportunities for career development. Hackman and Oldham (1976) describe both job variety and autonomy in their seminal job characteristics model. The model assumes that specific job characteristics lead to positive psychological states, which in turn lead to work satisfaction (Judge et al., 2000). Job variety relates to the degree to which different skills are required to conduct one's work

(Hackman & Oldham, 1976). It is positively related to work motivation and satisfaction, and negatively related to burnout (Humphrey et al., 2007). Autonomy refers to the employees' freedom to make self-directed decisions about work (Hackman & Oldham, 1976). It is positively related to work satisfaction, and negatively related to intention to quit (Spector & Jex, 1991). Strain is defined as "aversive and potentially harmful psychological reactions of the individual to stressful work" (de Croon et al., 2004, p. 443). Strain results from a demanding work environment, where job demands such as time pressure are high, and decision latitude is low and hence the individuals' adaptive capability is exceeded (A. B. Bakker et al., 2003; Karasek, 1979). Numerous studies have demonstrated that strain negatively predicts work satisfaction (Van der Doef & Maes, 1999). Finally, opportunities for career development refer to the possibilities for further development and further education that are offered to employees (Prümper et al., 1995). Employers are perceived as more attractive and employees are less likely to leave their occupations when opportunities for learning and growth are provided (Van der Heijden, 2003; Van der Heijden, van Dam, & Hasselhorn, 2009).

In the current study, the task-related work characteristics job variety and autonomy are selected as they refer to evaluations of the occupational tasks themselves and have been among the most commonly investigated aspects of work design (Morgeson & Humphrey, 2006). Additionally, strain is selected as a frequently used measure of qualitative and quantitative work demands in the work design literature (Parker, Van den Broeck, et al., 2017). Finally, we include opportunities for career development as these are directly related to personal growth and career building, which is generally valued by young adults and implies important information for apprentices' future career development (Carstensen, 1992).

Hypothesis 1a) Work characteristics experienced during VET, specifically job variety, autonomy, strain, and opportunities for career development, are positively related to VET satisfaction, measured at the end of VET.

Predictive validity of work satisfaction

There is a long tradition of research on the fundamental role of job or work satisfaction in explaining turnover. According to Lent and Brown (2006), the terms job satisfaction and work satisfaction can be used interchangeably. Throughout this paper, we use the term work satisfaction. Early models on career change already discuss how dissatisfaction evolves into turnover, and why people quit their jobs or occupations (Dawis & Lofquist, 1984; Mobley et al., 1979; Rhodes & Doering, 1983). Multiple antecedents impact the evaluation of one's work satisfaction, including organizational and personal factors, the perceived availability of alternatives, and the perceived correspondence or fit between a person and their work environment. If an individuals' needs and skills fit the requirements of the work environment, satisfaction (or correspondence) is achieved; if this fit is not established, dissatisfaction evolves. One possible response to dissatisfaction caused by misfit is the movement to a new work environment, whereby the previously unsatisfactory situation is actively adjusted (Dawis, 2002). The strong predictive validity of work satisfaction for turnover, and of the work characteristics underlying work satisfaction, has been confirmed in several comprehensive meta-analyses (Griffeth et al., 2000; Rubenstein et al., 2018). Apart from other causes, higher age and tenure, high overall work satisfaction, and a positive evaluation of work characteristics emerge consistently as negative predictors of turnover (Mobley et al., 1979; Rubenstein et al., 2018). Still, most of the established literature targets the change of jobs or organizations, and not occupational change (Blau, 2007; Van der Heijden et al., 2009). Recently, Otto et al. (2010) demonstrated that work satisfaction is negatively related to the intention to change occupations, just as hypothesized in the early career change models. While research found that satisfaction with one's occupation predicts occupational turnover intention (Li et al., 2019), research linking work satisfaction to actual occupational change is still scarce (Carless & Arnup, 2011).

Because individuals are less likely to leave their occupations after receiving specific training (Shniper, 2005), not only work satisfaction, but especially VET satisfaction is important to understand vocational career trajectories. VET satisfaction is not limited to the immediate job context at a specific employer, but rather relates to the broader professional context. A positive evaluation of this context is thus closely related to higher occupational commitment (Otto et al., 2010). Occupational commitment refers to the psychological link between a person and their occupation (Lee et al., 2000). Commitment can be developed through a high person-occupation fit and social integration during the years of VET, where apprentices are trained to become professionals in their respective occupations (Nägele & Neuenschwander, 2014). Committed individuals identify strongly with their occupations, report higher levels of work satisfaction, and are consequently less willing to change their occupations (Blau, 2000; Lee et al., 2000; Yousaf et al., 2015).

Cohen (2007) suggests that apprenticeship programs significantly influence the development of occupational commitment, ultimately leading to an occupational identity tied to the learned profession. While apprentices build an occupation-specific set of work role requirements and capabilities needed to perform well during VET (Dierdorff et al., 2009), the process of occupational identity development takes place (Erikson, 1968). Occupational identity development is considered as one of the most important tasks of adolescence, providing the individual with a sense of "who am I" (Skorikov & Vondracek, 1998, p. 17) in a central life domain. Apprentices thus establish their personal identity as workers during VET as they convert from adolescence to adulthood (Porfeli et al., 2011). Ultimately, occupational identity is established, when the assessment of the VET occupation is overall positive (Meyer et al., 1993), and adolescents express satisfaction with the occupation they were trained in (i.e., VET satisfaction). Because the period of VET is a formative process which involves the development of occupation-specific human capital, occupational commitment, and one's occupational identity, we assume that work-related experiences gained during VET have a long-lasting impact on future career development and decisions. More specifically, we assume that the overall assessment of this experience in terms of VET satisfaction predicts occupational change within ten years after graduation.

Hypothesis 1b) VET satisfaction measured at the end of VET is negatively related to occupational change up to ten years after finishing VET.

Satisfaction as a mediator between work characteristics and occupational change

As occupations differ in the required knowledge, skills, and abilities (Morgeson et al., 2010), they have different prevailing work designs (Parker, Van den Broeck, et al., 2017) and provide different opportunities for individuals to meet their needs and interests (Dierdorff & Morgeson, 2007, 2013; Morgeson et al., 2010). Being satisfied with one's occupation is an important mediating factor in predicting occupational change. This assumption has already been formulated in the model of career change by Rhodes and Doering (1983), but has remained untested in studies targeting occupational change. So far, we have argued that VET satisfaction predicts occupational mobility and that work characteristics experienced during VET are important determinants of VET satisfaction. This leads to the assumption that VET satisfaction acts as a mediator in the relationship between work characteristics experienced during VET and occupational mobility.

Hypothesis 1c) VET satisfaction measured at the end of VET mediates the relation between work characteristics experienced during VET and occupational change up to ten years after finishing VET.

The lasting impact of early formative experiences

In the current study, we aim to highlight the importance of the formative VET context (Frese, 2008) with its early exposure to occupation-specific working conditions in explaining occupational change. To examine the relevance of VET satisfaction for occupational change up to ten years after graduation, more proximal predictors, such as work satisfaction prior to change, need to be considered as well. Therefore, we included both work satisfaction and work characteristics from employment after VET in the second part of the study. Following the argumentation for Hypothesis 1, we first assume that work satisfaction is determined by work characteristics, after controlling for VET satisfaction (Hypothesis 2a). Second, we assume that VET satisfaction still has predictive power in explaining occupational change, even when the more proximal predictor of work satisfaction in employment after VET graduation is included (Hypothesis 2b). Finally, in line with Hypothesis 1c, we assume that work satisfaction mediates the relation between work characteristics and occupational change, also in regular employment after VET (Hypothesis 2c).

Hypothesis 2a) Work characteristics experienced in employment after VET, specifically job variety, autonomy, strain, and opportunities for career development, are positively related to work satisfaction in employment after VET.

Hypothesis 2b) Work satisfaction in employment after VET and VET satisfaction are both negatively related to occupational change up to ten years after finishing VET.

Hypothesis 2c) Work satisfaction in employment after VET mediates the relation between work characteristics experienced in employment after VET and occupational change up to ten years after finishing VET.

Method

Context of the current study

The current study investigates occupational mobility in the context of the VET system in Switzerland, which is well established for a wide range of occupations and industries (Fuller & Sigelman, 2017). For three to four years, apprentices attend vocational school and a work place in a company that provides on-the-job learning. In these two complementary learning environments, occupation-specific skills are acquired and certified (Ebner et al., 2013). Due to this strong linkage of the educational system and the labor market, the transferability of occupation-specific human capital is low (Grunow & Mayer, 2007), and occupational mobility specifically costly (Blau, 2007). Because the educational content is specified in distinct skill bundles for each occupation (Eggenberger et al., 2018), the impact of occupation-specific work design is particularly well-defined in VET-based vocational careers. VET creates a unique opportunity to get an intimate knowledge of one's future work role while acquiring occupation-specific knowledge and skills (Ebner et al., 2013).

Participants and procedure

Our sample is taken from the longitudinal panel study on Transitions from Education to Employment (TREE) in Switzerland, which uses a representative sample to follow school leavers in their post-compulsory educational pathways. The panel is based on the Swiss cohort of the Program for International Student Assessment (PISA) in 2000. The panel participants finished compulsory school in the year 2000 and were followed up with a total of nine measurement waves from 2001 to 2014. The first seven waves were conducted on an annual basis (2001–2007), wave eight was carried out in 2010, and the final wave nine in 2014. A mix of paper-and-pencil surveys, telephone interviews, and computer-assisted telephone interviewing (CATI) was used to collect the data (for details see TREE, 2016b).

We only included participants who reported VET as their first education (n = 2,593) and provided information in the last measurement wave in 2014 (n = 1,609), approximately ten years after finishing VET. Out of this group, our final sample consists of 902 VET graduates (50% female) who provided information on their VET satisfaction and work characteristics at the end of VET in 2003, as well as on their current occupation in 2014 (representing a response rate of 56.1%). The average age in 2003 was 17.1 years (SD = 0.64 years, range: 15–18 years). Participants were trained in a broad range of occupations, clustered within 48 occupational groups, including commercial employees, occupations of trade, engineering, construction industry, and the health sector . In the ten years after finishing VET, 40.5% had not changed their occupation and were subsequently coded as stayers (n = 365, 60.3% female), whereas 59.5% had changed the occupation at least once from their initial VET occupation (n = 537, 43% female) and were coded as changers.

To test Hypotheses 2a, b, and c, additional information on work characteristics and work satisfaction between 2004 and 2010 was needed. This information was only provided by a subsample of 462 participants (59.7% female), since participants had missing data for some measurement waves. If a participant had changed the occupation during the observed period (e.g., change observed in wave 8), measures of work characteristics and work satisfaction were taken from the measurement wave before the change had occurred (e.g., wave 7). If no change had occurred, measures were taken from the last available wave before 2014. Accordingly, the relevant measurement waves are change-specific (CS), instead of wave-specific, and differ between participants: For 54.8% of the subsample, CS measures are taken from wave 8, for 25.3% from wave 7, for 8.2% from wave 6, for 8.7% from wave 5, and finally, for 3% from wave 4. Figure 1 provides an overview of the samples, points of measurement, and included measures.

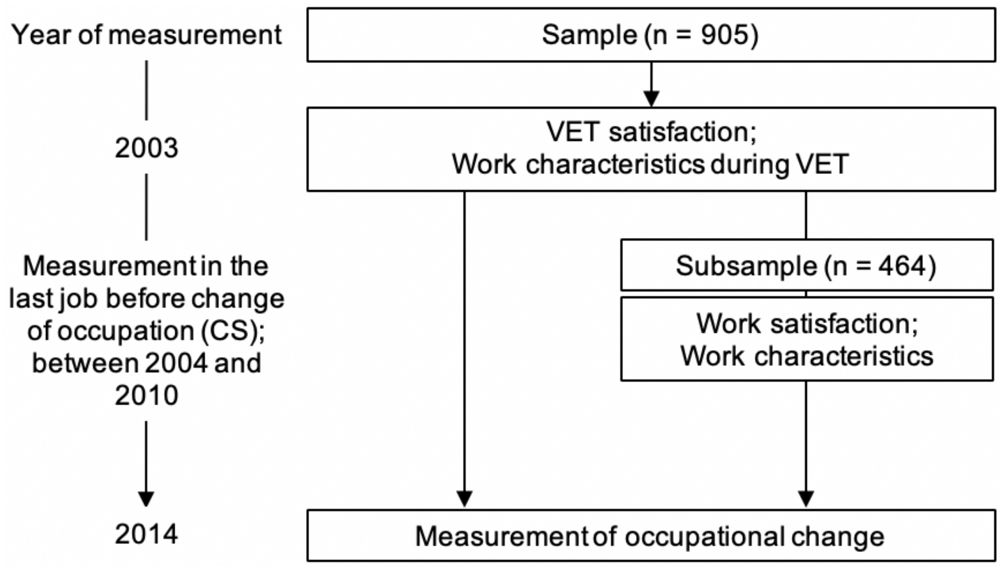

Figure 1. Overview of samples, points of measurement and included measures. VET = Vocational training and education, CS = Change specific.

For the assessment of attrition bias, we entered work characteristics measured at the end of VET, gender, and occupational change assessed in 2014 in a logistic regression analysis predicting the probability of being included in the subsample (Goodman & Blum, 1996). Female respondents were more likely to belong to the subsample ($B = –.69$, $p < .000$, $OR = .50$) as did participants with higher VET satisfaction ($B = .39$, $p = .003$, $OR = 1.48$) and lower rates of occupational change ($B = –.65$, $p < .000$, $OR = .52$).

Measures

Work characteristics. Work characteristics, both during VET and in employment after VET, were measured on a five-point Likert-type scale ranging from *1 = never/rarely* to *5 = very often/always*, based on scales by Prümper, Hartmannsgruber, and Frese (1995) that were widely used in German-speaking surveys at the time of the initiation of the TREE panel study. Items were adapted in their wording to the VET specific context by TREE (2016a). *Job variety* was measured using a three item scale. A sample item is, “My tasks at work are diversified”. *Autonomy* was measured with three items, a sample item is, “I can decide myself how I want to solve a task”. *Strain* was measured using five items. A sample item is, “At work I am constantly pushed for time". *Opportunities for career development* were measured with the following two items, "My company offers professional development" and "My company offers career opportunities". The same work characteristics were measured during VET and in employment after graduation. Cronbach's alpha internal consistencies for all measures are reported in Table 1.

VET satisfaction. Satisfaction with the trained occupation (VET satisfaction) was measured with a four item scale developed by Neuenschwander (1998) and Neuenschwander, Herzog, and Holder (2001). A sample item is, "I really like the work that my occupation contains". The four-point Likert-type scale ranged from *1 = not at all true* to *4 = exactly true*.

Work satisfaction. Work satisfaction was measured with the two items "I hope my work is going to stay as good as it is at the moment" and "After a day off, I am looking forward to go back to work", developed on the basis of Baillod (1992) and Bruggemann, Groskurth, and Ulich (1975). The seven-point Likert-type scale ranged from *1 = hardly ever* to *7 = almost always*.

Table 1

Descriptive statistics and intercorrelations for all variables included in the model

		M *(SD)*	1	2	3	4	5	6	7	8	9	10	11	12	13
1	VET satisfaction	3.18 *(0.63)*	(.80)												
2	Job variety	3.96 *(0.72)*	.50***	(.85)											
3	Autonomy	3.44 *(0.83)*	.20***	.39***	(.71)										
4	Strain	2.51 *(0.59)*	–.07*	.06	–.11***	(.64)									
5	Opportunities	2.67 *(0.83)*	.26***	.40***	.22***	.03	(.79)								
6	GSE	3.06 *(46)*	.12***	.18***	.13***	–.04	.13***	(.77)							
7	CS Work satisfaction	4.17 *(1.36)*	.25***	.23***	.09*	–.04	.18***	.06	(.71)						
8	CS Job variety	3.77 *(0.77)*	.23***	.36***	.14**	.04	.23***	.09	.51***	(.73)					
9	CS Autonomy	3.71 *(0.82)*	.14**	.19***	.28***	–.07	.11*	.09	.41***	.49***	(.81)				
10	CS Strain	2.39 *(0.56)*	–.08	–.04	–.04	.29***	.08	–.03	–.03	.22***	.05	(.82)			
11	CS Opportunities	2.46 *(0.82)*	.18***	.13**	.06	–.04	.31***	.06	.40***	.38***	.24***	.05	(.81)		
12	CS GSE	3.17 *(0.42)*	.14**	.09	.06	.03	.07	.47***	.16***	.11*	.10*	–.08	.10*	(.84)	
13	Gender	0.50	–.05	–.02	–.10**	.11***	.04	.16***	–.05	.05	–.08	.05	.15**	.17***	
14	Occupational change	0.60	–.21***	–.12**	–.03	.05	–.07*	.07*	–.20***	–.15**	–.13**	.12**	–.07	–.07	.14**

Note. N = 462 for CS measures 6 to 10, and 902 for all other measures. VET satisfaction = Satisfaction with trained occupation, Opportunities = Opportunities for training and development, GSE = Generalized self-efficacy, CS = Change specific measurement wave. Gender was codes as female = 0, male = 1. Occupational change was coded as no change = 0, change = 1. Cronbach’s alpha reliabilities are reported along the diagonal in parentheses.

$^*p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Control variables. Because the results on gender differences in career mobility research have been ambiguous (Carless & Arnup, 2011), we included gender as a control variable in all analyses. We did not control for age and level of education as our sample is drawn from one age cohort and selected based on type of education. To account for person-related characteristics, we included generalized self-efficacy (GSE) as a control variable when testing the hypotheses predicting VET satisfaction and work satisfaction. GSE reflects a general belief of "one's fundamental ability to cope, perform, and be successful" (Judge & Bono, 2001, p. 80), and is positively related to work satisfaction (Judge & Bono, 2001). GSE was measured with four items based on scales by Schwarzer (2009), and Schwarzer and Jerusalem (1999). The items were measured on a four-point Likert-type scale ranging from *1 = not at all true* to *4 = exactly true.* A sample item is "I am confident that I could deal efficiently with unexpected events".

Data Analysis

Hypothesis 1a was tested with a linear regression of work characteristics on VET satisfaction, measured at the end of VET in the year 2003. Accordingly, a second linear regression of work characteristics on work satisfaction, measured in participants' post graduate employment between 2004 and 2010, depending on the individual's year of occupational change, was computed for the testing of Hypothesis 2a. Using binary logistic regression, we examined in a longitudinal design whether VET satisfaction (Hypothesis 1b), and work satisfaction (Hypothesis 2b) were related to occupational change up to ten years after finishing VET. All analyses were calculated in SPSS 26. To test the hypothesis specifying the indirect effects (Hypotheses 1c and 2c), the conditional process modeling (PROCESS) program for SPSS (Hayes, 2013) was used. We used Model 4 of the PROCESS macro to test our hypotheses and conducted 10'000 bootstrap samples to examine the indirect effects of work characteristics on occupational change through VET satisfaction, and work satisfaction, respectively. This procedure allowed us to compute the coefficients for direct and indirect paths between work characteristics and occupational change, based on the recommendations of Preacher and Hayes (2008).

Gender was significantly correlated to the focal variable occupational change. Additionally, it was positively correlated with work characteristics, both in VET (autonomy and strain), and in later employment (career opportunities). While GSE measured during VET was positively correlated with occupational change, CS GSE was not. Hence, all results are reported including the two control variables.

Results

The descriptive statistics and correlations among all study variables are displayed in Table 1. Results show that all work characteristics are significantly related to both, VET satisfaction and work satisfaction, except for CS strain. Also, both types of satisfaction are negatively related to occupational change, which provides initial support for our hypotheses.

In Hypothesis 1a, we assumed a relation between positively evaluated work characteristics during VET and VET satisfaction. Results of the hierarchical linear regression are presented in Table 2. The overall model explained 27% of variance in VET satisfaction $F(6,895) = 55.07$, $p < .001$. After controlling for gender and GSE, job variety, strain, and opportunities for career development were significant predictors of VET satisfaction, whereas autonomy had no effect, thus, providing partial support for Hypothesis 1a.

The results from binary logistic regression used to test whether VET satisfaction (Hypothesis 1b) predicted occupational change are presented in Table 3. VET satisfaction emerged as a significant predictor in Model 2, $\chi^2(2, N = 902) = 63.87$, $p < .001$), the model successfully distinguished between stayers and changers, 62.9% of all participants were correctly classified. Thus, supporting our Hypothesis 1b, participants high in VET satisfaction were less likely to have changed their occupations ten years after finishing VET.

Table 2

Linear regression analysis predicting VET satisfaction at the end of VET (full sample)

Predictor	Model 1 *B (SE)*	Model 1 β	Model 1 *t*	Model 2 *B (SE)*	Model 2 β	Model 2 *t*
Constant	2.69 (.14)		19.18***	1.61 (.17)		9.50***
Gender	–.09 (.04)	–.04	–2.12*	–.05 (.04)	–.04	–1.30
GSE	.18 (.05)	.13	3.80***	.04 (.04)	.03	.90
Job variety				.41 (.03)	.48	14.26***
Autonomy				–.01 (.02)	–.02	–.53
Strain				–.11 (.03)	–.10	–3.51***
Opportunities				.06 (.02)	.08	2.45*
Total R^2 (ΔR^2)	.02 (.02***)			.27 (.26***)		
F	8.39 (2, 899)***			55.07 (6, 895)***		

Note. *N* = 902. Variables were taken from 2003 of the TREE data set. GSE = Generalized self-efficacy, Opportunities = Opportunities for career development. VET satisfaction = Satisfaction with trained occupation. Gender was coded as female = 0, male = 1.
**p* < .05. ****p* < .001.

Table 3

Summary of logistic regression analysis predicting occupational change (full sample)

Predictor	Model 1 *B (SE)*	Model 1 *OR*	Model 2 *B (SE)*	Model 2 *OR*
Constant	.05 (.09)	1.05	2.36 (.41)***	10.56
Gender	.70 (.14)***	2.01	.68 (.14)***	1.98
VET satisfaction			–.72 (.12)***	.49
Model χ2 (df)	26.03 (1)***		63.87 (2)***	
–2 log likelihood	1191.41		1153.57	
R^2 (Cox & Snell)	.03		.07	
R^2 (Nagelkerke)	.04		.09	

Note. *N* = 902. OR = odds ratio. Predictor variables were taken from 2003 of the TREE data set. Occupational change was measured in 2014. VET satisfaction = Satisfaction with trained occupation. Gender was coded as female = 0, male = 1.
****p* < .001.

For testing Hypothesis 1c, stating that VET satisfaction would mediate between work characteristics experienced during VET and occupational change, the measures for work characteristics and VET satisfaction were taken from the end of VET (year 2003), and the dependent variable occupational change was measured in 2014. In the full sample (N = 902), the impact of most work characteristics on occupational change was mediated by VET satisfaction. We found a significant negative indirect effect for job variety, ab = –.28, SE = .07, 95% CI [–.42, –.17], and career opportunities, ab = –.04, SE = .02, 95% CI [–.08, –.01], whereas strain had a significant positive indirect effect on occupational change, ab = .07, SE = .03, 95% CI [.02, .14]. There was no indirect effect for autonomy, ab = –.01, SE = .02, 95% CI [–.03, .05], which corresponded to the results from Hypothesis 1a, where autonomy was no significant predictor of VET satisfaction. Thus, Hypothesis 1c was partly supported.

In our subsample ($N = 462$), Hypothesis 2a tested whether work characteristics experienced in employment after VET were positively related to work satisfaction prior to occupational change. After controlling for gender and CS GSE, VET satisfaction was added to account for prior (dis-)satisfaction, and finally, CS work characteristics were introduced to the model. Overall, the model explained 38% of variance in work satisfaction, $F(7,451) = 39.41$, $p < .001$. All work characteristics were significant predictors for work satisfaction, supporting Hypothesis 2a (Table 4).

Results of the logistic regression analysis testing the impact of work satisfaction during employment after VET on occupational change are presented in Table 5 (Hypothesis 2b). To test incremental effects of VET satisfaction, the variable was included after controlling for gender. The full Model 3, containing VET satisfaction, work satisfaction, and the control variable gender, was statistically significant, $\chi^2(3, N = 462) = 36.97$, $p < .001$), 61% of the participants were correctly classified. Supporting our Hypothesis 2b, participants high in VET satisfaction, and work satisfaction in later employment were less likely to change their occupations. Furthermore, VET satisfaction remained a significant predictor of occupational change also when work satisfaction as the more proximal predictor was included to the model, hence both constructs independently distinguished between stayers and changers.

Table 4

Linear regression analysis predicting work satisfaction in employment after VET (subsample)

	Model 1			Model 2			Model 3		
Predictor	*B (SE)*	β	*t*	*B (SE)*	β	*t*	*B (SE)*	β	*t*
Constant	2.44 (.47)		5.14***	1.01 (.55)		1.85	–.73 (.54)		–1.34
Gender	–.22 (.13)	–.08	–1.68	–.16 (.13)	–.06	–1.29	–.25 (.11)	–.09	–2.35*
CS GSE	.57 (.15)	.18	3.81***	.46 (.15)	.14	3.09*	.26 (.12)	.08	2.11*
VET satisfaction				.54 (.11)	.23	4.97***	.19 (.09)	.08	1.99*
CS Job variety							.62 (.08)	.35	7.48***
CS Autonomy							.27 (.07)	.16	3.72***
CS Strain							–.28 (.09)	–.12	–3.01**
CS Opportunities							.38 (.07)	.23	5.60***
Total R^2 (ΔR^2)	.03 (.03***)			.08 (.08***)			.38 (.30***)		
F	7.81 (2, 459)***			13.69 (3, 458)***			39.41 (7, 454)***		

Note. *N* = 462. Variables were taken from the wave before occupational change of the TREE data set. GSE = Generalized self-efficacy, VET satisfaction = Satisfaction with trained occupation, Opportunities = Opportunities for career development, CS = Change specific measurement wave. Gender was coded as female = 0, male = 1.
**p* < .05. ***p* < .01. ****p* < .001.

Table 5

Summary of logistic regression analysis predicting occupational change (subsample)

	Model 1		Model 2		Model 3	
Predictor	*B (SE)*	*OR*	*B (SE)*	*OR*	*B (SE)*	*OR*
Constant	–.23 (.12)	.79	2.01 (.60)**	7.43	2.65(.64)***	14.21
Gender	.58 (.19)**	1.79	.56 (.20)**	1.74	.55 (.20)**	1.74
VET satisfaction			–.68 (.18)***	.51	–.55 (.18)**	.58
CS Work satisfaction					–.26 (.08)***	.77
Model $\chi 2$ (df)	9.22 (1)**		24.86 (2)***		36.97 (3)***	
–2 log likelihood	631.22		615.61		603.49	
R^2 (Cox & Snell)	.02		.05		.08	
R^2 (Nagelkerke)	.03		.07		.10	

Note. *N* = 462. *OR* = odds ratio. Predictor variables were taken from the wave before occupational change in the TREE data set. Occupational change was measured 2014. VET satisfaction = Satisfaction with trained occupation, CS = Change specific measurement wave. Gender was coded as female = 0, male = 1.
***p* < .01. ****p* < .001.

To test Hypothesis 2c, assuming a mediating role of work satisfaction in the relation between work characteristics and occupational change, measures of both work characteristics and work satisfaction were taken from the change specific measurement wave. Significant negative indirect effects were found for CS job variety, *ab* = –.13, *SE* = .06, 95% CI [–.26, –.01], CS career opportunities, *ab* = –.08, *SE* = .04, 95% CI [–.17, –.01], and CS autonomy *ab* = –.05, *SE* = .03, 95% CI [–.12, –.00]. CS strain had a significant positive indirect effect, *ab* = .06, *SE* = .04, 95% CI [.01, .14], on occupational change, corresponding with the results from Hypothesis 1c. Work satisfaction mediated the relation between all work characteristics and occupational change, supporting our Hypothesis 2c. Additionally, CS strain had a significant direct effect on occupational change after taking other CS work characteristics into account: Higher reported CS strain predicted later occupational change, *c'* = .52, *SE* = .18, 95% CI [.15, .88], *p* = .005.

Discussion

Recently, occupations have been introduced as stabilizing factors of contemporary careers (Dierdorff, 2019). Therefore, a focus on occupational dynamics is gaining importance, also because today, many employees are more strongly committed to their occupation rather than to their employing organization (Anteby et al., 2016). This seems to be especially important in vocational careers, where individuals adopt occupation-specific roles, values, and identities during VET. Our findings show that the work-related experience made during the formative phase of occupational identity development (Skorikov & Vondracek, 1998) has a long-term impact on career decisions, supplementing the empirically well-established influence of work satisfaction as an antecedent of job turnover. The current study does not only highlight the importance of VET satisfaction for the understanding of occupational change but also brings early occupation-specific work characteristics into focus.

As expected, we found that most work characteristics experienced during VET predict VET satisfaction, except for autonomy. In the context of the VET system, apprentices have to follow instructions and display specific occupation-related behavior (Borkowsky, 2000). Hence, as the training contexts requires learning and maneuvering within specific borders, autonomy may not be considered as an essential aspect of VET satisfaction. In line with our hypothesis, apprentices reporting high VET satisfaction were less likely to have changed their occupation ten years after graduation. Furthermore, VET satisfaction mediated the relation between work characteristics and occupational change. Previous research has provided extensive evidence for the influence of work design on individuals and organizations (Parker, 2014). Our findings contribute to this literature and add an occupational lens to the discussion.

Apprentices actively develop “shared patterns of thought and action” (Anteby et al., 2016, p. 191), and become socialized into their respective occupations throughout the formative phase of VET. It is also during this phase, where work design strongly impacts the development of the satisfaction with the occupation trained in, and consequently also the development of the individuals’ occupational identity. Research has repeatedly reported the “functional importance” (Skorikov & Vondracek, 2011, p. 698) of occupational identity, linking it to numerous positive outcomes like psychological well-being, social adaptation, occupational success, and work satisfaction (Carson & Mowsesian, 1993). Occupational identity is formed “over time with varied experiences and meaningful feedback“ (Ibarra, 2006, p. 3), as provided by the apprenticeship system and its early exposure to occupation-specific work characteristics. As a result, occupational identities are carefully formed as “relatively stable and enduring constellations of attributes, beliefs, values, motives, and experiences through which people define themselves in professional roles” (Ibarra, 2006, p. 3). In combining work design research with research on occupational turnover, our study provides evidence for the importance of work design for vocational career trajectories.

Our findings furthermore establish that both VET satisfaction and work satisfaction play an important role in understanding occupational change as both constructs distinguished between stayers and changers. Work satisfaction and VET satisfaction can be considered as two distinct constructs that individually contribute to a better understanding of occupational mobility in vocational careers. In participants’ employment after graduation, all work characteristics, including autonomy, were confirmed as predictors of work satisfaction.

Additionally, work satisfaction mediated the relation between work characteristics and occupational change, supporting our hypotheses and prior theoretical assumptions (Rhodes & Doering, 1983). The predictive power of work satisfaction on occupational change is not surprising and has been extensively established in previous research. More interestingly, we find that VET satisfaction predicts occupational change over a long period of time. This finding adds new insight to the discussion of career mobility, and also responds to a recent call to adopt an occupation-centric lens in theory and research (Dierdorff, 2019). A stronger focus on occupational influences also seems relevant when understanding VET in the context of vocational development. Future research should thus expand on the link between occupational identity, occupational commitment, and work design related predictors of occupational change. Also, macro-level labor market factors, such as job supply could be included to provide further information on the underlying processes for research and practice.

Strain emerged as a direct antecedent of occupational change in employment after graduation in our analysis. Major, Morganson, and Bolen (2013) report that occupational commitment in IT professionals is negatively predicted by job stress. Similarly, Blau (2007) found that work exhaustion predicts occupational change in medical technologists. Our findings correspond with these results and provide further evidence of the relation between strain and occupational change for a broad range of occupations. Furthermore, de Croon and colleagues (2004) found that occupational change leads to a larger strain reduction compared to job change within the same occupational domain. According to these findings, high work-related psychological strain might have the power to directly impact occupational change and thereby reduce the perceived strain. Consequently, strain could be included as a focal predictor in future studies and theoretical models on occupational change.

Limitations

The main limitation of our study concerns attrition bias for the subsample. Nonrandom sampling was observed for some variables, directing towards staying in the trained occupation. Participants in the subsample were more likely to stay in their VET occupation and report higher VET satisfaction than those who had missing data for some waves and were thus excluded from the subsample. Our hypotheses were nevertheless supported, and occupational change was predicted by low VET and low work satisfaction, respectively. Because our results thus show that participants with low VET satisfaction were both more likely to change their occupation and to be excluded from the subsample, the remaining subsample provides a more conservative test of our hypotheses that lower VET and work satisfaction would predict leaving the occupation. Furthermore, our study is limited to a rather narrow set of work-related predictors and control variables for occupational change. Because we focused on the impact of VET satisfaction on occupational change, we did not consider how changes in work satisfaction over time relate to occupational change. It is possible that the impact of the formative VET satisfaction diminishes after longer employment periods and temporal changes in work satisfaction become more important. Additionally, our analysis revealed that GSE significantly predicted work satisfaction in employment after VET, although it was not a significant predictor for VET satisfaction. This finding suggests that person-specific traits become more important over time, when identity formation and development is further advanced (Sokol, 2009). Similarly, unexpected external events or career shocks such as losing one’s job or receiving an unforeseen promotion (Akkermans et al., 2018), could also significantly impact individuals’ career paths. Future studies should hence account for changes in work satisfaction over longer employment periods and include person-related traits as well as possible career shocks to develop a comprehensive understanding of the impact of formative experiences on occupational mobility.

Despite these limitations, this study contributes to a better understanding of occupational mobility in vocational careers. During the ten years considered, the private and professional lives of the participants undoubtedly underwent many changes. But still, early experience during VET remains important for understanding vocational career trajectories. Learning that work characteristics during VET, and specifically VET satisfaction have the power to explain such a far-reaching behavior as changing one's occupation up to ten years later informs practitioners on how undesired occupational mobility could possibly be reduced: By targeting and adjusting unfavorable work characteristics and promoting high quality work design already during VET, as well as in post graduate employment, undesired occupational mobility can be addressed.

Conclusion

To our knowledge, this is the first study to include work characteristics from VET as antecedents of VET satisfaction, and more importantly, to introduce VET satisfaction as a predictor of occupational change in a panel study design. Work design during the formative learning context of VET holds distinct long-term predictive power for occupational change, over and above satisfaction with employment after VET. Although also other relevant antecedents need to be taken into account, as introduced by different theoretical models and previous research findings, the impact of early occupational experiences, already during vocational preparation, needs to be considered in the turnover literature as well. Here lay the grass roots of occupational change in vocational careers.

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2. Scientific Paper II

Facing Change with Stability: The Dynamics of Occupational Career Trajectories

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Abstract

In today's dynamic work environments, individuals have to manage their careers themselves. While research suggests that many individuals change jobs and organizations more frequently, they often pursue their careers within one occupation still. To date, we have little knowledge on how such seemingly stable careers unfold in the face of societal, economic, and technological changes. The current study addresses this question and explores the proactive and reactive strategies individuals use to sustain occupational stability throughout their careers. Applying qualitative content analysis to 32 semi-structured interviews, we revealed eight major strategies underlying the process of occupational stability maintenance. We discuss the identified strategies using control theory and job crafting as theoretical lenses and introduce the concept of occupational crafting for understanding stability maintenance in vocational careers. The study highlights occupations as meaningful reference points in contemporary careers and illustrates how both proactive and reactive strategies lead to occupational stability.

Keywords: Occupational stability maintenance, career management, vocational careers, occupational crafting, qualitative methods.

> I've often changed jobs […], the first years I only stayed for two years in one place […]. So why I stayed in the occupation is because you have many possibilities within the occupation. Just thinking about what I did after the apprenticeship and what I do now, it is a big difference […] And that was probably the reason I stayed but transformed myself within the occupation and kept looking for new challenges. (Patricia, commercial clerk)

Contemporary careers are characterized by rapid social, economic and technological changes (Greenhaus & Kossek, 2014), that impact the sustainability and applicability of established skills and lead to the need for personal development throughout the entire career (Van der Heijden et al., 2016). In addition, digitization and automation already have changed the world of work and will continue to have an enormous impact on individuals' career development (Bessen, 2016). Individuals, thus, need to adapt to altering work environments throughout their careers (Jansen & Shipp, 2019). Research nevertheless suggests that careers still exhibit large degrees of stability for many employees, for example when individuals stay in the same occupation, despite changing jobs and organizations (e.g., Zimmerman et al., 2020). As occupations are assumed to fill the void of destabilized organizational affiliations in boundaryless careers (Currie et al., 2006; Dierdorff, 2019), it is important to understand how stable occupational career trajectories unfold in the face of continuous changes in contemporary work environments. To date, we have little theoretical and empirical insight into these processes.

Because occupations that are based on vocational education and training (VET) consist of clearly defined skill bundles and produce occupation-specific human capital (Eggenberger et al., 2018) they are particularly vulnerable to changes in required tasks, and, thus, may suffer from reduced applicability of previously established skills, rendering OSM particularly demanding. Such specific human capital is at least partly lost when changing occupations, generating high costs for individuals, organizations, and the broader society (Becker, 1962). Individuals in VET occupations might therefore be particularly motivated to stay within the same occupation over the course of their careers. As apprenticeship systems enjoy increasing popularity across different countries and for multiple occupations (World Bank, 2019), it is timely to develop a better understanding of how individuals maintain occupational stability and sustain their occupational identity in vocational careers. Thus, the main aim of our study was to explore the process of occupational stability maintenance (OSM) in VET occupations.

Because little is known about the specific processes of OSM, we applied a qualitative approach to develop a deeper understanding of strategies and behaviors individuals engage in to preserve and (re-)establish fit with their occupations throughout their careers. We conducted 32 interviews with employees who completed VET and stayed in the occupation they had been trained in. Participants reflected on their career trajectories and provided rich information on how they maintained engaged with their occupation. We used qualitative content analysis to analyze the processes involved in OSM. Our results suggest that OSM occurs through the combination of eight distinct strategies. These strategies are based on individuals' efforts to continuously craft alignment with their occupations (Wrzesniewski & Dutton, 2001), either by adjusting to their work, or by actively changing it, using both primary and secondary control strategies (Heckhausen et al., 2010).

Our study makes two important contributions. First, we propose the concept of occupational crafting to capture the proactive and reactive strategies individuals use to stay engaged with their occupations, thereby expanding existing models in the life-span theory of control and job crafting. Second, to the best of our knowledge, this is the first study examining strategies individuals use to maintain engaged with their occupations, sustain their occupational identity, and preserve their occupation specific human capital while facing changing work requirements. By exploring the dynamics of stable vocational career trajectories, our study addresses recent calls for adopting an occupational lens in organizational psychology scholarship in order to address the role of occupations as anchors in increasingly volatile environments (Dierdorff, 2019).

Adopting an Occupational Lens in Understanding Career Trajectories

Occupations are fundamental reference points in career development and can consequently be considered as stabilizing elements in contemporary careers, which are characterized by more frequent changes of jobs and organizations (Anteby et al., 2016; Currie et al., 2006). The association with an occupation provides individuals with meaning and direction in their careers (Kreiner et al., 2006), and with a clear occupational identity (Hauschildt & Heinemann, 2013). The development of occupational identity, that is the occupation-specific “conscious awareness of oneself as a worker” (Skorikov & Vondracek, 2011, p. 693), is considered a critical developmental task in adolesce (Erikson, 1968). In apprenticeship based occupations, occupational identity development already takes place during the years of VET, where apprentices explore their new social role in a real work context (Zimmer-Gembeck & Mortimer, 2006). VET has recently been linked to occupational stability, highlighting the formative character of early vocational experiences and emphasizing their lasting impact on commitment to one's occupation (Medici et al., 2020). Occupational identity promotes career decision making in line with personal strengths and values and supports problem solving in challenging situations (Skorikov & Vondracek, 2011). Consequently, occupational stability is linked to numerous positive outcomes through strong occupational identities, such as effective performance and psychological well-being (Baruch & Cohen, 2007).

Additionally, occupational stability is also beneficial from an economic perspective. Occupations consist of collections of tasks and work role requirements that call for the application of specialized skills and knowledge to complete these tasks (Dierdorff et al., 2009). This is especially the case for apprenticeships based occupations, where the educational content is tailored to comparatively narrow occupational demands and labor market needs (Eggenberger et al., 2018). In apprenticeship programs like the Swiss VET system (Hoffman & Schwartz, 2015), apprentices are trained in line with employer specifications, preventing possible skill gaps and unlocking otherwise unrealized potential to the economy (Fuller & Sigelman, 2017). Thus, human capital investment is lost for both employees and employers when entering a new occupational domain (Feldman & Ng, 2007; Kambourov & Manovskii, 2008), rendering occupational mobility a costly, major career transition that requires the development of fundamentally new skills (Blau, 2007).

Strategies for Maintaining Occupational Stability

Anteby and colleagues (2016) suggested that occupations can be understood through three different lenses. The first lens, “becoming”, focusses on how individuals become socialized into an occupation. The second lens, “doing”, focusses on how occupational members perform activities and highlights individual agency for career outcomes like occupational identity, or meaningfulness. The third lens, “relating”, focusses on rations between occupations and the surrounding environment. For the process of OSM, the “doing” lens seems particularly promising as it adopts an agency perspective, but also relates to how individuals have to adaptively respond to changes in their occupations and the wider environment and alter their occupational practices as a response (Nelson & Irwin, 2014). In line with this notion, we conceptualize OSM as an adaptive process that includes both proactive and reactive elements for stability maintenance.

The adaptive capacity to steer one’s development is highly relevant (Heckhausen et al., 2010), especially facing the turbulent work environment of today’s careers (Greenhaus & Kossek, 2014). Although not typically linked to the careers literature, the life-span theory of control (Heckhausen et al., 2010) describes how individuals use both primary and secondary control strategies to optimize their sense of control. Primary control refers to individuals' attempt to change the environment in line with personal needs and desires, while secondary control refers to individuals' attempt to change the self to better align with the environment. The need for asserting control is also addressed in the concept of job crafting, which is more specifically tailored to the context of work. Job crafting describes "the proactive steps that employees take to modify the cognitive, physical, and relational boundaries of their work" (Grant & Parker, 2009, p. 342). It is motivated by three basic needs, the need for control, a positive self-image, and connection with others (Wrzesniewski & Dutton, 2001). A job can be crafted through changing task boundaries by changing "the form or number of activities one engages in while doing the job" (Wrzesniewski & Dutton, 2001, p. 179), through changing cognitive task boundaries by changing the perception of the task itself, or through changing relational boundaries by shaping interpersonal interactions at work (Wrzesniewski & Dutton, 2001). To date, job crafting has been mostly studied in terms of person-job fit, specifically regarding job demands, job resources and individuals' personal abilities, preferences, and needs (Tims & Bakker, 2010), but has never been applied to the broader context of occupations.

Informed by the theoretical assumptions from the life-span theory of control and job crafting, the present study aims to increase our understanding of how individuals' "do" their occupations (Anteby et al., 2016) throughout their vocational career trajectories. To this aim, we explored how individuals maintain their occupational stability and sustain their occupational identity and human capital investments. In so doing, we also heed calls to examine processes involved in career agency through an occupational lens (Dierdorff, 2019; Richardson et al., 2021).

Method

To elaborate the process of OSM, we performed an interview study using summarizing qualitative content analysis (Mayring, 2014). Applying a qualitative approach allows for a deeper understanding of how personal and social processes which are not yet well understood unfold over time (Bluhm et al., 2011). In summarizing qualitative content analysis, categories emerge in a rule-bound procedure directly from the data. The interpretation of these categories is theory oriented, allowing researchers to include prior theoretical knowledge for interpretation. The analysis consists of several steps for data reduction and interpretation, which makes the analytical process comprehensible and contributes to transparency (Mayring, 2014). The distinct steps we followed are described in the data analysis section.

Research Context and Participants

This study was conducted within the VET context of Switzerland, which is well known for its apprenticeship system. About two-thirds of all young adults enter VET after nine years of compulsory school. Having about 240 occupations across all industries to choose from apprentices are trained for three to four years and build occupation-specific knowledge. Our sample included employees from different life and career stages, following a stratified sampling process (Robinson, 2014). We selected one occupation as a representative for each of the eight occupational divisions of the Swiss Standard Classification of Occupations (SSCO 2000, (Federal Statistical Office, 2014) and interviewed 32 employees who had remained in their trained occupation during their entire career (four per occupation, see Table 1 for details).

Table 1

Participant Characteristics

Pseudonym	Gender	Age	Occupation	Years in occupation	Years at current employer
Amy	female	24	Commercial clerk	5	5
Anthony	male	33	Cook	14	5
Barbara	female	31	Salesperson	12	1
Brian	male	49	Gardener	28	3
Carol	female	23	Salesperson	5	2
Charles	male	24	Electrician	4	2
Christopher	male	57	Cook	38	1
David	male	32	Electrician	12	7
Elisa	female	50	Medical assistant	30	8
George	male	32	Computer scientist	12	12
James	male	46	Gardener	26	26
Jessica	female	45	Medical assistant	26	4
John	male	29	Polymechanic	10	8
Joseph	male	31	Cook	11	3
Laura	female	27	Commercial clerk	9	5
Linda	female	24	Computer scientist	5	2
Margaret	female	40	Medical assistant	20	18
Mark	male	40	Salesperson	22	1
Mary	female	26	Cook	7	2
Michael	male	34	Gardener	10	6
Michelle	female	26	Salesperson	7	3
Patricia	female	44	Commercial clerk	25	7
Paul	male	32	Electrician	11	5
Robert	male	35	Polymechanic	15	10
Ryan	male	30	Electrician	10	10
Sandra	female	35	Medical assistant	16	12
Sharon	female	33	Computer scientist	12	3
Steven	male	32	Polymechanic	11	11
Susan	female	57	Gardener	37	22
Tanya	female	50	Commercial clerk	29	10
Thomas	male	40	Polymechanic	20	9
William	male	24	Computer scientist	5	5

Data Collection and Analysis

The interviews followed a semi-structured guideline covering key topics regarding working life and career development, starting with participants' career choice, evaluation of work experiences, reasons for staying in the chosen occupation, and the interface of work and private life. Effects on career satisfaction, employability, perceived attractiveness of the occupation, and the intention to stay were discussed. Because advances in digitization and automation are known to impact individuals' work and career experiences (Hirschi, 2018; Parker & Grote, 2020), participants were also asked to reflect on how technological change had influenced their career development. All interviews were conducted in German and transcribed verbatim from audio tapes. Throughout the article, we use participants' pseudonyms (see Table 1).

Data analysis followed the systematic, rule-bound method of summarizing qualitative content analysis with a focus on inductive category development (Mayring, 2014). The objective of this method is the stepwise reduction of the material, preserving the essential contents, and creating a comprehensive overview through abstraction. As a first analytic step, content-bearing text passages, specifying anything participants do to maintain occupational stability were identified and, in a second step, paraphrased by the first two authors. In this manner, 10% of the transcripts were processed, leading to a total of 140 paraphrases. Semantically identical paraphrases were merged and reduced to a total number of 126 paraphrases as a third step. Then, all authors independently grouped the generalized paraphrases into higher order categories, based on semantic similarities (Bechky & Okhuysen, 2011). Through this analytical process, a category system consisting of 18 codes, subsumed under eight higher-order categories, was developed. Using the category system, three interviews were independently coded by the first author and a trained research assistant. These interviews were used to calculate the interrater reliability. Cohen's Kappa was .84, indicating a strong level of agreement in code use (McHugh, 2012). Subsequently, the remaining 28 interviews were coded. Finally, the categories were classified into proactive and reactive strategies. Table 2 provides an overview of the categories and codes.

Table 2

Strategies of Occupational Stability Maintenance in Vocational Career Trajectories

Strategy type and higher-order categories	Codes
Reactive Strategies	
Dealing constructively with change	Dealing constructively with change in general
	Dealing constructively with technological change
Mastering challenges in daily work	Acknowledging challenges
	Enjoying these challenges
Proactive Strategies	
Using resource spillover	Using professional skills as a resource (for private life)
	Using private life as resource
Hybrid Strategies	
Reinforcing occupational attachment	Preserving pure intrinsic motivation towards occupation (affect, pleasure, passion, interest)
	Evaluating own occupation as relevant (cognitive, personal relevance, meaningfulness)
	Being a role model
	Engaging in occupational association
Benefitting from social relations	Building and using professional social relations with supervisors
	Building and using professional social relations with colleagues/team
	Building and using professional social relations with other sources (customer/patients)
Adjusting role demands across life domains	Adjusting work
	Adjusting private life
Promoting personal/ professional development	Promoting personal/professional development in daily work
	Promoting personal/professional development through formal education (incl. motivation for it)
Changing employer	Changing employer to adjust working conditions
	Changing employer because of other motives

Note. Total N = 32.

Findings

We describe the processes involved in OSM in terms of the identified proactive and reactive strategies individuals use to sustain alignment with their occupations and maintain stability throughout their vocational careers. Two strategies were used in a reactive mode only: *mastering challenges in daily work,* and *dealing constructively with change*. One strategy was only used in a proactive mode: *using resource spillover.* The remaining five strategies participants used both proactively and reactively: *reinforcing occupational attachment, benefitting from social relations*, *adjusting role demands across life domains, promoting personal and professional development*, and *changing employer*. These strategies of OSM are conceptualized as hybrid avenues to OSM.

Reactive Avenues to OSM

Most participants had experienced that new work tasks evolved, new work methods or instruments emerged throughout their careers. The resulting work demands often required altered skill sets and were thus perceived as challenging. Participants vividly described *mastering challenges in their daily work*, such as high task related responsibility or conflict-laden social interactions. Acknowledging that such challenges existed was important for coping and overcoming them was gratifying. By accomplishing challenging tasks or managing unpredictable and stressful situations at work, professional and personal development were triggered. For example, Jessica, a medical assistant, described how being confronted with a difficult situation with an apprentice finally led to professional development in her role as a VET trainer and how she learned to set boundaries:

> Training an apprentice is strenuous. It is exciting […] yes, it was a challenge. Sometimes when I came home, I had no idea, what should I do next? What am I supposed to do with this young woman? She was so strong and challenged me. It was unbelievable. […] I wanted to show her everything, but she kept refusing to learn

> things that were not yet on her curriculum and was talking back at me a lot. Finally, I had to say, no, there are no ‘buts’, you’re here to learn and we’ll do it my way.

Experiencing growth through mastering challenges was also linked to perceptions of self-efficacy. To successfully overcome challenges, participants stated that it is important to be constructive, especially when confronted with a change that reshapes the occupation itself. By *dealing constructively with change*, participants successfully responded to such developments and remained employable, e.g., through learning new skills. In some cases, maintaining a positive attitude towards change was facilitated by a promising outlook or already witnessed benefits. For instance, new safety regulations for handling chemicals or using new medical equipment had severely altered core tasks and procedures for medical assistants, however the perceived positive implications, such as time savings or increased quality management, facilitated adaptation to the new situation. Many changes were linked to technological development and participants often described these changes as learning opportunities, as the example of Robert, a polymechanic, shows:

> I personally have the feeling that [technological] progress makes the occupation interesting. Well, for me personally. Because I want to progress and see something new, hence it would bore me if I had to work with the same machine for thirty years. Even though work might change a little bit, through technology, tools or through progress as such, but I think that’s what makes the job also interesting.

Proactive Avenues to OSM

The only purely proactive strategy participants described was *using resource spillover* to enhance participants’ work-life balance, and consequently allowed for sustainable careers. Recognizing interdependencies between life domains, participants described how they proactively used professional skills as a resource in private life, as the example of Steven, a polymechanic, illustrates:

> I moved recently and assembled all my furniture myself. […] The screws in one of the chairs didn't fit, so I just trimmed it a bit and now it fits. When I see people that aren't even able to put up a picture on the wall, I'm glad I learned a manual occupation.

Participants further described how friends and family approached them in their occupational role, asking for specific advice. In these interactions, they were addressed as experts in their respective fields and participants appreciated the associated feeling of competence. Being approached in one's occupational role was also linked to the establishment and maintenance of a strong occupational identity. Elisa, a medical assistant, put it like this: "Friends and family come to you for advice if you have a medical background. It is gratifying to be there for someone and help with your knowledge. […] I identify strongly with my occupation, also in private life." A positive spillover effect between life domains was even more often described in the other direction when private life was actively used as a resource for career-related development. One of two paths of resource spillover from the private to the work domain was an overlap of activities and interests. Connected to occupational knowledge and skills, participants illustrated how their hobbies and occupations were aligned in a way that private activities fostered occupational skills. One example is Susan, a gardener, who tested new designs and arrangements in her private garden, to provide better customer service: "I can gain experience in my own garden, which I can then also pass on to my customers. Being able to pass on something from my own, practical experience, that's really nice." In the other path, participants described how they used their private domain as a resource to improve the balance between domains. Here, hobbies and leisure time were used to detach from work and recharge one's batteries, which in turn positively affected their performance and motivation at work. Participants further described how a supportive spouse, family members, and friends were important, especially during further education.

Hybrid Proactive and Reactive Avenues to OSM

Participants used most strategies in a hybrid way, promoting occupational stability both proactively and reactively, depending on the specific context. The strategies involved actively changing task, cognitive, or relational boundaries within occupational roles, thereby crafting one's work situation to foster the experience of meaning and relevance, as the following descriptions will show. One frequently mentioned strategy concerned preservation of intrinsic motivation for one’s occupation by *reinforcing one's occupational attachment.* Participants specifically emphasized that they still liked the occupation’s core tasks and activities and how reinforcing this joy and interest motivated them, too. Ryan, an electrician, described it like this:

It’s a very interesting occupation, you have the technical knowledge or know-how but at the same time, you have the craftmanship, so it is theoretical, sometimes you have to think pretty hard how to solve something or complicated, complex cases but at the same time it is also the manual work, [...] this combination always suited me pretty well. And we also have opportunities for further education, where you are able to connect the existing theoretical knowledge [with new knowledge] and educate yourself further. That’s why I stayed in the occupation.

By attaching meaning to the immediate relevance of their work, participants engaged in cognitive crafting and generated further motivation to stay in their occupations. For instance, Amy, a commercial clerk, emphasized the relevance of her occupation in terms of customer satisfaction:

Simply helping others, that’s very close to my heart, and not just doing one thing after another, not knowing what the result is. So, I think here, if you offer a product to a customer and they can use it and are satisfied, then I see ah, my work is meaningful.

Another way of reinforcing occupational attachment was engaging in occupational associations and training apprentices. Engaging in occupational associations was an avenue to actively promote the development of the occupation, targeting improvement in working conditions or opportunities for further education. Working as a vocational trainer was meaningful in two ways. Here, participants could position themselves as (occupational) role models and pass on their knowledge and skills. Interestingly, participants also valued the role as VET trainers as a source for their own professional development, as new knowledge or techniques coming from vocational schools had to be mastered to provide up-to date training, which was experienced as an enjoyable challenge, as the example from John, a polymechanic, illustrates:

They [the apprentices] come with questions and problems that I have never seen before. This pushes me to figure it out myself, ultimately, because I have to be able to explain it to them. And I think this is very fun and interesting.

Benefitting from social relations trough interactions with supervisors, colleagues, or clients was a further hybrid strategy of OSM. Participants described how they engaged in relational crafting by proactively establishing a supportive work environment to keep themselves and others motivated in their occupation and prevent occupational mobility. Through supportive interactions with supervisors, participants experienced trust and encouragement to engage in learning opportunities which allowed them to deepen their professional knowledge. This was especially important for younger participants. For older employees, the establishment of trusting and meaningful relationships, resulting in the possibility to shape their work with own ideas and gaining higher autonomy for conducting specific work tasks, was more important. Conversely, participants' work experience was also influenced by colleagues, and experiencing supportive work relationships was personally valued. For instance, Michelle, a salesperson, described how former work relationships evolved into friendships, leading to higher team cohesion and a feeling of belonging, making work relationships personally meaningful: “We are such a small store with around ten employees. We get along great; we have built friendships. If you’re not doing well, the others will notice and will help each other. It’s really nice to work like that.”

Nourishing customer feedback, and the experience of occupational self-efficacy in interactions with others supported participants in forming positive occupational self-evaluations and were a relevant source for experiencing meaning. Receiving gratitude and appreciation in such interactions was motivating and rewarding and compensated for negative work experiences. Sometimes, customer or patient interactions even developed into long lasting relationships, fulfilling the basic need for human connection at work. It was also in customer interactions, where participants experienced professional competence, as Ryan, an electrician, explained:

Also, when customers have a special request, where you sometimes have to think about it a little first or look for a solution that is specifically tailored to the customers’ needs. And when you are able to present your solution and the customer is really satisfied and says, yes, that’s what I imagined, that’s a wonderful enrichment.

To promote sustainable career trajectories, participants *adjusted role demands across life domains*. For instance, participants proactively reduced their workload during career episodes characterized by further education. To create space for personal growth from further education, participants decided to cut back on working hours and gave up on a part of the salary. Social support from spouses additionally facilitated the establishment and maintenance of work-life balance. When occupational role demands became overwhelming and endangered continuance motivation, participants responded by managing their work in a way that allowed for better detachment after work, or by becoming more efficient at work through optimizing tasks and activities. One important component of this reactive adjustment process included the deliberate cognitive framing of work as one part of life only. This cognitive crafting is apparent in the account by James, a gardener, as he described his understanding of work as something he had only achieved through a learning process over time:

I also took the pressure home, which I do less nowadays. Today, I can say, 'Now I'm at home, now is private life.' My mobile phone is put away, and I won't check my e-mails or anything. You have to be able to handle this, otherwise you're not doing yourself a favor. Also health wise and so on. You really have to learn this, I really had to learn this, too.

Participants' narratives also included adjustments of role demands in the private domain to compensate for a strong engagement at work. George for example, a computer specialist, described how time spent with friends and family was scarce and how he was relying on everyone's flexibility and understanding:

And that's where I notice that I'm not flexible anymore. Sometimes I even have to cancel on short notice, which was extremely difficult for me in the beginning. I'm normally not the person who cancels spontaneously, but rather, when I've made plans, I stick to it, and I show up. But it has happened that I had to cancel last minute because something came up, something escalated or I received a notification in the middle of a dinner at a restaurant, and I had to leave.

Occasionally, participants actively allowed for unclear boundaries between life domains, as this was also linked to more flexibility. Here, continuing to work at home in the evenings or on weekends was one approach to reduce high workload, engaging in work related hobbies was another. Christopher, a cook put it like this:

Being interested in what you do. For me it's not reading newspapers at home but having 300, 400 cookbooks. You live with it [the occupation] and collect. Someone else collects flags or something if he's a car fan, and the cook collects books or knives. But that's something you only do if you see yourself in what you do.

Another strategy apparent in participants' narratives was *promoting personal and professional development*, either through further education or in daily work. Professional growth reflected a strong developmental motive and participants described different pathways leading to personal development while allowing for, or explicitly promoting occupational stability. Engaging in further education was used as a reactive strategy to keep up with occupational changes but was also proactively utilized as a signaling strategy towards employers, increasing perceived job security and employability, as this quote by Carol, a salesperson, illustrates:

I think it's very important [...] to engage in further education to be attractive for the job market. Show, that you're not just a normal worker, so to say. That you really have something to show for, so that you have it easier in the vocational world.

Promoting one's development in daily work was seen as equally important as the attainment of formal degrees. Here, participants' narratives include reactive responses to changing requests in occupation-specific skills (e.g., through the introduction of new technology) or proactively initiated behaviors promoting opportunities for development. For example, James, a gardener, described how he wanted to learn about the company's business processes, although they were not part of his occupational role. By demanding insights into these areas, he actively changed his occupational boundaries and added new work tasks to his role, which traditionally belong to another occupation. Thus, he engaged in job crafting, yet on an occupational level:

I wanted to be able to understand, how does it work, from the first customer contact to accounting, all these processes, I always wanted to know how they work. That was my initiative. I always said to my supervisor 'Hey, I also want to be able to bill accounts, I also want to be able to write an offer.' In fact, I've always wanted this, no one told me to do so. […] Its' funny how I never specialized in head gardener or landscape gardener but focused on the commercial courses.

Finally, participants stressed the importance of both the organizational and occupational context for dealing with change in their narratives. When employers provided appropriate learning environments, participants enjoyed the opportunity for professional and personal growth. However, if the opportunity for development was limited at the current organization, an *employer change* was a way to proactively create new opportunities to grow, while staying within the respective occupation. For some occupations (e.g., cooks), changing the employer was even described as a typical strategy for professional growth. Generally, changing employers allowed participants to enter new specialized fields (e.g., working for a dermatologist vs. a pediatrician), actively build their resumes to increase their attractiveness on the job market, and deepen knowledge and skills based on their interests and desired future perspectives in the occupation. Hence, change through organizational mobility served to maintain occupational stability, as illustrated by Linda, a computer scientist:

So, you can choose basically depending on the employer what you want to do. And if at some point I don't like a part anymore, then I can just switch to a new part. So, I don't have to look for something completely new, I have the training for everything, and I can just try out other things.

Sometimes, changing employers wat not only linked to developmental goals, but also a reaction to unsatisfactory working conditions. This dissatisfaction was the motivation to change employers and gain control over ones' professional development, as illustrated in this quote by Amy, a commercial clerk:

I changed because I wanted something new, because, well, I knew how to do everything and, for instance, I didn't have to make an effort to achieve a good performance assessment. So, I had to say, well, getting good grades is nice, but I want to be challenged, […] I want to perform, not just do some work, and go back home.

Discussion

Based on the argument that people are in need of stable reference points to successfully navigate change, we investigated how individuals maintained their occupational stability facing changes in today's dynamic world of work. We took occupations as such a reference point because the investment in education, training, and socialization into an occupation makes them valuable, and occupational change costly, while at the same time maintaining one's occupation does not preclude job and organizational mobility (Dierdorff, 2019). We adopted an agency perspective as proposed by Anteby and colleagues (2016) to explore what individuals do to maintain their occupational stability. In order to better understand the dynamics involved OSM, this study has drawn on qualitative content analysis of career narratives by individuals who remained in their initial occupations after graduating from VET. We found that eight different strategies support occupational stability. These strategies are closely linked and influence each other, for instance, when personal development through further education requires a shift in the balance of life domains, or when meaning is created through proactively crafting more demanding tasks, which also allows for personal and professional development.

Despite the continuance in one occupation, individuals' narratives included both stability, for instance when being satisfied at the current employer, and change, for instance when adopting to technological developments through further education. In some situations, participants initiated change, altered the boundaries of their occupations, and engaged in occupational crafting. While job crafting is beneficial for employees and organizations in multiple ways (Rudolph et al., 2017), we found that individuals use similar strategies to build vocational careers, and not only use it to change the boundaries of their jobs within a given organization. Our findings indeed show that individuals engage in occupational crafting, conceptualized as the proactive use of strategies and behaviors to achieve, and maintain occupational stability in a continuous adjustment process. For instance, one of the gardeners expanded his tasks over and above the typical occupational role and skill set by engaging in further education and taking over commercial responsibilities. He thereby not only crafted his current job, but engaged in occupational task crafting, expanding his future career potential. With regards to cognitive crafting, we found that individuals strive to perceive their work as meaningful, but also to demonstrate to others how their occupation instils meaning, for instance as vocational trainers or as representatives of occupational associations. Finally, participants also engaged in relational crafting on an occupational level by actively creating supportive work environments to sustain their own and others' occupational stability.

Individuals used occupational crafting as a primary control strategy to proactively shape their work according to their own interests, skills, and abilities. Yet not only the proactive path of occupational crafting was important to sustain occupational stability, being reactive and adapting to situational demands was also relevant in order to grow from experience. Such a reactive path was for instance taken by a polymechanic who took advantage of technological change as a learning opportunity, thereby promoting professional and personal growth. Heckhausen and colleagues (2010) postulate that primary and secondary control strategies are jointly used to maximize individual control capacity. Whenever primary control cannot be exerted, secondary control strategies, that is adapting own expectations, intentions, and behaviors to external demands, are used to stay engaged in one's occupation. In such situations, participants reacted upon their environment, adapting to changes in their work context. Engaging in further education was for instance such a secondary control strategy participants used as a response to technological development, and subsequent changes in their occupational tasks.

Further education, as well as growing through mastering challenges in daily work leads to higher perceived employability (Van der Heijden et al., 2016). Recently, the agency perspective of employability has been challenged, though, and a more nuanced view which also emphasizes contextual dependencies in work arrangements has been proposed (Forrier et al., 2018). Our findings support this view as participants' adaptive reactions to situational demands (e.g., changes in occupational tasks due to technological advancement) also led to higher perceived employability and occupational self-efficacy. Yet, a recent study by Rigotti and colleagues (2018) has also found that demands which exceed personal coping capacities reduced career-related self-efficacy. Hence, it is likely that there is an upper limit to demands which can promote occupational self-efficacy and development.

The narratives further showed that participants aimed for a good balance between life domains throughout their careers. Sometimes, this balance was established through actively separating the domains, while the integration of both domains was actively pursued to profit from resource spillover in other situations. For instance, participants used resource spillover to enhance balance as a response to changing demands, ultimately leading to higher motivation and performance at work. One example is Carol, a salesperson, who utilized her private technological knowledge when facing challenging technological system changes at work, enabling her to work more productively. Furthermore, private life was also exploited as a resource to actively detach from work. This finding is in line with the work-home perspective on sustainable careers as introduced by Greenhaus and Kossek (2014). According to this perspective, individuals shift their energies across different roles and domains over time, acting in an agentic and self-regulatory way. Our results support this perspective as the proactive nature of the strategy illustrates.

Our findings make two important contributions. *First,* our findings connect job crafting theory and the life-span theory of control and demonstrate how the theories may be expanded into the realm of vocational careers. Connecting the theories allows to understand both individuals' immediate interactions with their work environment as well as their attempts to balance life domains throughout their career trajectories to maintain their occupational stability. OSM thus consists of a continuous process of realignment between the person and their occupation, attained through proactive and reactive strategies, and is characterized by an intimate interplay of stability and change.

Second, our study highlights the relevance of occupations for individual career management. The occupational stability this paper explored is based on a dynamic interplay of distinct strategies which allow for continuous transformation and development throughout the career. As assumed, participants' narratives also included thick descriptions of occupational identity development and its preservation, which were also linked to the specifics of the VET system. For instance, engaging in vocational associations or training apprentices fostered participants occupational identity, and increased their human capital simultaneously. Our findings stress that both proactive and reactive strategies are needed to realize adaptive development within one occupation, demonstrating the relevance of the life-span theory of control for understanding specific career-related behaviors. Careers do not happen in a vacuum; hence a process-oriented approach is required to understand how individuals navigate their careers in interaction with different contexts, acknowledging that the strategies are influenced by both proximal (e.g., family) and distal (e.g., technology) factors and are not linked to one specific career or life stage only.

Limitations and Future Research

Despite the diverse sample in terms of age, occupational and organizational tenure, and industries, our study exhibits limitations. First, this research was conducted in the Swiss VET context, where individuals build human capital in one specific occupation. Educational systems which provide students with more general knowledge may prompt less OSM efforts as the education itself is not as closely linked to a specific occupation. It is thus possible that not all of the identified strategies are generalizable to other educational and cultural contexts. Future research could validate the strategies with a large, cross-cultural sample and examine how the strategies relate to sustainable career outcomes in more varied contexts. Second, our findings are based on the retrospective understanding of our participants' careers and their subjective evaluation of events, decisions, and personal actions. Though appropriate for the purpose of this study, the method allows individuals to reevaluate, reformulate, and suggest alternative interpretations, favoring internal explanations of their own behavior. Consequently, we encourage future studies to focus on contextual and personal boundary conditions leading individuals to use a strategy proactively or reactively.

Conclusion

Our study explored vocational career trajectories and emphasizes the role of occupations as stabilizing elements in contemporary careers. The study highlights the need to understand vocational careers as a result of internal and external influences which is captured in the finding that participants used many strategies for occupational stability maintenance both proactively and reactively. Our findings further demonstrate that seemingly stable career trajectories within one occupation contain both stability and change. More specifically, our findings highlight avenues for expansion of job crafting theory and the life-span theory of control by introducing the concept of occupational crafting, and by identifying primary and secondary control strategies for (re)stablishing alignment between person and occupation.

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3. Scientific Paper III

Technological self-efficacy and occupational mobility intentions in the face of technological advancement: A moderated mediation model

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Abstract

While research on the effects of technological advancement on job design has gained traction, we know little about how personal and contextual factors relate to work attitudes and mobility intentions in the context of increasing digitization. Based on social cognitive career theory, we investigated the influence of technological self-efficacy beliefs (TSE) on occupational commitment and occupational mobility intentions. We included the occupational automation potential and developmental support as contextual moderators. Based on a survey study with 512 employees and two data points, we found that TSE was directly and indirectly negatively related to occupational mobility intentions through the mediating role of occupational commitment. For individuals in occupations with low and medium automation potential, the relation between TSE and mobility intention was stronger. Additionally, the relation between occupational commitment and mobility intention was stronger for individuals receiving more developmental support. Our findings provide first evidence for the relevance of TSE for occupational mobility intentions and the impact of automation potential and perceived developmental support on this relationship. We discuss these results in terms of an enhanced conceptual understanding regarding the influence of technological advancement on occupational mobility intentions and provide practical implications for enabling employees to deal with changing work environments.

Keywords: technological self-efficacy, automation potential, developmental support, social cognitive career theory, occupational mobility

Introduction

Digitization and automation will dramatically change the world of work in the coming decades (Arntz et al., 2016). Therefore, they are considered highly important factors for shaping the nature of work and individual career development (Hirschi, 2018; Parker & Grote, 2020). In light of destabilized organizational affiliations and more boundaryless careers, occupations are expected to play a key role as stabilizing reference points in contemporary careers (Anteby et al., 2016; Currie et al., 2006; Dierdorff, 2019). Research suggests that technological advancements will not eliminate whole occupations but rather substitute or alter specific tasks (Arntz et al., 2016; Bessen, 2016), resulting in transformed work design within jobs and occupations (Parker & Grote, 2020). If individuals want to stay employable within their occupations, they have to either adapt to the altered work requirements (Van Vianen, 2018), or, alternatively, pursue a different career path (Chen et al., 2019).

Whether individuals are capable of coping and adaptively dealing with such changes at work critically depends on their level of self-efficacy (Savickas, 1997). Self-efficacy reflects an individual’s belief in their ability to successfully perform a particular behavior or course of action (Lent & Brown, 2013). Because the perception of competence in performing tasks is specific to the respective occupational context (Rigotti et al., 2008; Schyns & von Collani, 2002), self-efficacy also relates to core constructs of individual career development, like occupational commitment and occupational mobility intentions (Cooper-Hakim & Viswesvaran, 2005; Klassen & Chiu, 2011; Lee et al., 2000). Therefore, the more specific technological self-efficacy (TSE), defined as the belief to successfully perform a new, technologically sophisticated task (McDonald & Siegall, 1992), seems to be a promising personal factor for promoting occupational commitment and averting occupational mobility intentions when dealing with technology-related changes at work.

Still, research on possible effects of the technological advancement and transformation of work on occupational mobility is scarce. Previous research found that the anticipated sustainability of one's job in the face of technological advancement predicts perceived job insecurity (Nam, 2019), which in turn influences job satisfaction and organizational commitment, as well as turnover intentions (Staufenbiel & König, 2010). Yet, how technology-related changes and individuals' attitudes towards such changes influence commitment and mobility intentions at the occupational level, has to the best of our knowledge never been addressed.

Using the social cognitive career theory (SCCT, Lent et al., 1994; Lent & Brown, 2013), as a theoretical framework, the present study introduces TSE as a relevant personal factor that shapes successful career paths in view of technological advancement. In line with the basic assumptions of SCCT, TSE is expected to predict occupational mobility directly and through the mediating role of occupational commitment. More specifically, if individuals believe they have the necessary capabilities to perform technologically sophisticated tasks within their occupations, they are expected to thrive in the altered occupational context, which promotes their occupational commitment, and reduces occupational mobility intentions.

Within SCCT, objective and subjective supports and barriers from the environment (e.g., social, cultural, and economic context) are assumed to influence career development. Because the risk of being replaced by automation is tangible for many workers (Frey & Osborne, 2017), we propose that the automation potential of one's occupation and the support for further development are particularly important contextual factors for career development in light of technological advancement. First, heeding calls to examine more distal contextual factors for career development, we argue that the objective automation potential (AP) of occupations is an important macro-level contextual factor that impacts individual career development. The AP of an occupation reflects the degree to which the core tasks of an occupation can be substituted by technology already available today (Dengler & Matthes, 2018). Thus, if a computer can perform a specific task more efficiently and cheaply than a person, it is likely that the task is automated, and that technology replaces the worker. Second, because technological change also affects the applicability of established skills and knowledge within one's occupation (Hirschi, 2018), individuals need to invest in their further development throughout the whole career (Van der Heijden et al., 2016). Consequently, support for further development is considered an important, more proximal contextual factor for adaptive career self-management (Lent & Brown, 2013). In the present study, we address these two contextual factors by including the AP of occupations, and perceived developmental support by supervisors as key moderators for occupational mobility intentions.

By studying the interplay of personal and contextual factors for individuals' occupational mobility intentions, our study makes two important contributions. First, we introduce technological self-efficacy as a relevant person-specific factor for understanding career development in the face of technological advancement. Second, we show how automation potential and developmental support represent key contextual factors which moderate the relation between self-efficacy beliefs, occupational commitment, and occupational mobility intentions. Thereby, we provide new empirical insights on how technological advancement impacts occupational mobility intentions in contemporary careers.

Adaptive career management in the new world of work

Given the ubiquity of technology-driven change at the workplace (Frank et al., 2019), it will be highly relevant for individuals to proactively manage technology-related career opportunities and challenges (Hirschi, 2018). A prominent theory that addresses how individuals navigate their careers considering challenging career choices, is the SCCT (Lent et al., 2000; Lent & Brown, 2013). SCCT views individuals as reciprocally interacting with their social context and focuses on adaptive career behaviors across the life span, such as decision-making skills or role transitioning. The theory highlights the importance of individual agency for career development and emphasizes the role of self-efficacy for adaptive career behavior. SCCT proposes that individuals develop interest in occupational fields where they hold high self-efficacy beliefs and expect beneficial outcomes from engaging in the activity or domain (i.e., outcome expectations). It further proposes that self-efficacy beliefs promote adaptive career behavior both directly and indirectly through individuals' interests and chosen goals. Moreover, self-efficacy is not only linked to adaptive behavior but also to the self-regulation of affective states (Bandura, 1977), such as work attitudes. And as high self-efficacy enables individuals to proactively shape their environment to their advantage, it is positively related to proactive behaviors, higher job and organizational commitment, and lower turnover intentions (Gruman et al., 2006; McNatt & Judge, 2008; Saks, 1995; Singh et al., 2013).

At the occupational level, self-efficacy beliefs impact how individuals respond to changes within their occupations and whether they remain interested in, and committed to their occupational career paths (e.g., Park & Jung, 2015). Occupational commitment is conceptualized as the "psychological link between a person and his or her occupation" (Lee et al., 2000, p. 800), that consists of the three dimensions affective commitment (i.e., the desire to remain in the occupation), normative commitment (i.e., the obligation to remain in the occupation), and continuance commitment (i.e., perceived costs when leaving the occupation) (Meyer et al., 1993). While past research has for the most part focused on the affective dimension of occupational commitment (Meyer & Espinoza, 2016), Spurk et al. (2019) have recently argued that macro-events, such as a global economic crisis, may influence all three dimensions of occupational commitment, and future studies should thus include multidimensional measures. Considering the fundamental impact of digitization and automation on work experiences, we frame technological advancement as such a macro-event and, therefore, included all three dimensions in this study.

Following the basic assumptions of SCCT, occupational commitment is considered a highly relevant work attitude that is related to various positive (e.g., job satisfaction) and negative work experiences (e.g., stress) which has repeatedly proven to be a powerful predictor of occupational mobility intentions in previous work (Lee et al., 2000; Spurk et al., 2019; Yousaf et al., 2015). For instance, Klassen and Chiu (2011) found that occupational self-efficacy impacted occupational commitment, which in turn was negatively related to occupational mobility intentions in a sample of teachers. Moreover, occupational commitment is an important resource for navigating the uncertainty and complexity inherent to contemporary careers (Akkermans et al., 2018; Hall et al., 2018), and is, therefore, considered to be a key variable for understanding individual career development (Cooper-Hakim & Viswesvaran, 2005).

The relevance of self-efficacy beliefs for dealing with technological advancement

Self-efficacy beliefs are malleable and are substantially influenced by changes in task requirements, personal experience, and the availability of specific resources to successfully perform a task (Gist & Mitchell, 1992). Following Bandura's (2018) recommendation to study specific self-efficacy beliefs tailored to the particular requirements of a situation, we examine the role of TSE. Due to the increasing influence of technological advancement on occupations, we argue that in addition to the more general occupational self-efficacy, that is the belief to successfully fulfil a work-related task (Rigotti et al., 2008), individuals' specific self-efficacy beliefs regarding technology are highly relevant for occupational commitment and occupational mobility intentions.

TSE is positively related to the acceptance of technology, as well as to the intention to use it (Celik & Yesilyurt, 2013). Prior research on TSE is limited to a rather narrow range of specific settings. So far, the influence of TSE has been explored for the use of technology in higher education and online classes (Huffman et al., 2013; Pan, 2020; Warden et al., 2020), and in healthcare (Rahman et al., 2016). Because occupational self-efficacy is important to understand self-directed career management behavior (Lent & Brown, 2013), it is likely that within the context of technology-induced changes, specific technology-related self-efficacy beliefs are essential for understanding the process leading to occupational mobility. Nevertheless, the relevance of TSE for occupational mobility, or occupational mobility intentions, has, to the best of our knowledge, never been addressed.

Based on the theoretical assumptions from SCCT, we argue that if technological advancement changes established occupational tasks in a way that individuals' feel they are not willing or able to perform well any longer, they might lose their interest in the altered work environment, reduce their occupational commitment, and, consequently, develop withdrawal intentions. Because self-efficacy beliefs promote adaptive career behavior both directly and indirectly (Lent & Brown, 2013), we assume that TSE acts as a specific cognitive person factor which impacts both occupational commitment and occupational mobility intentions. More precisely, as individuals with high TSE are more ready to adapt to technology-induced changes, we assume that TSE is negatively related to occupational mobility intentions. Additionally, because self-efficacy affects how committed individuals are towards their goals (Bandura, 2015), we assume that occupational commitment partly mediates the relation of TSE on occupational mobility intentions.

Hypothesis 1: TSE is negatively related to occupational mobility intentions.

Hypothesis 2: Occupational commitment mediates the relation between TSE and occupational mobility intentions.

Automation potential and developmental support as moderating variables

As outlined above, we propose that the AP of one's occupation, and perceived support for development are especially important factors for career self-management in the face of technological advancement (Hirschi, 2018).

Automation potential (AP). Technological advancement will transform virtually all occupations (Frank et al., 2019). Nevertheless, occupations vary in their AP, depending on the amount of tasks which can be substituted by different technologies (Dengler & Matthes, 2018). Additionally, employees perceive technology-induced change in different ways and develop specific attitudes towards it (Schneider & Sting, 2020). Still, employees have been shown to not be the best judges of their own risk of being replaced by technology (Brougham & Haar, 2017). Therefore, the current study draws on the objective AP of occupations (Dengler & Matthes, 2015, 2018) to investigate under which conditions TSE leads to stronger occupational commitment, and lower withdrawal intentions. We assume that the AP of the occupation strengthens the relationship between TSE, occupational commitment, and occupational mobility intentions because it renders TSE more relevant for being successful in one's occupation and allows to express TSE more. Accordingly, if the occupational context offers a relevant level of technology related change, people with high TSE will thrive in the altered work environment and thus be more committed to their occupation. Consequently, we assume the positive relation between TSE and occupational commitment to be stronger for high AP occupations (Hypothesis 3a). Furthermore, staying in one's occupation is considered adaptive for individuals with high TSE if the occupational context offers technology-related changes in job requirements (high AP occupation). Therefore, we assume that the direct relation between TSE and occupational mobility intentions is stronger for high AP occupations, as presented in Hypothesis 3b.

Hypothesis 3a. AP moderates the relation between TSE and occupational commitment, such that the positive relation between TSE and occupational commitment is stronger when AP is high.

Hypothesis 3b: AP moderates the relation between TSE and occupational mobility intention, such that the negative relation is stronger when AP is high.

Developmental support by supervisor. Considering technology-induced change and occupational mobility, updating one's professional skills through formal or informal further education is viewed as a critical career-related behavior (Hirschi, 2018)**,** and supervisor support for development is crucial for fostering such adaptive behavior (Lent & Brown, 2013)**.** Work environments that support employees in their career and skill development promote individuals' perceived employability (Wittekind et al., 2010), defined as "an individuals' chance of a job in the internal an/or external labor market" (Forrier & Sels, 2003, p. 106). Moreover, research shows that turnover intentions depend on the level of support for further development (Maertz et al., 2007). Within SCCT, the cognitive person variable of self-efficacy is expected to interact with contextual influences, that "have the capacity to enable or limit agency and to codetermine the outcomes of adaptive behaviors" (Lent & Brown, 2013, p. 562)**.** We propose that the degree to which individuals are supported to promote their professional development is such a critical contextual moderator. More specifically, we assume that developmental support moderates the negative direct relation between occupational commitment and occupational mobility intention.

Hypothesis 4: Developmental support moderates the relation between occupational commitment and occupational mobility intention, such that the negative relation is stronger when developmental support is high.

In combination with the proposed mediation model, we finally propose a partially moderated mediation hypothesis, as presented in Hypothesis 5.

Hypothesis 5: The indirect relation of TSE to occupational mobility intentions through occupational commitment is conditional on the degree of AP and developmental support, in that AP strengthens the direct effect of TSE on occupational commitment (5a), and developmental support strengthens the direct effect of occupational commitment on occupational mobility intention (5b).

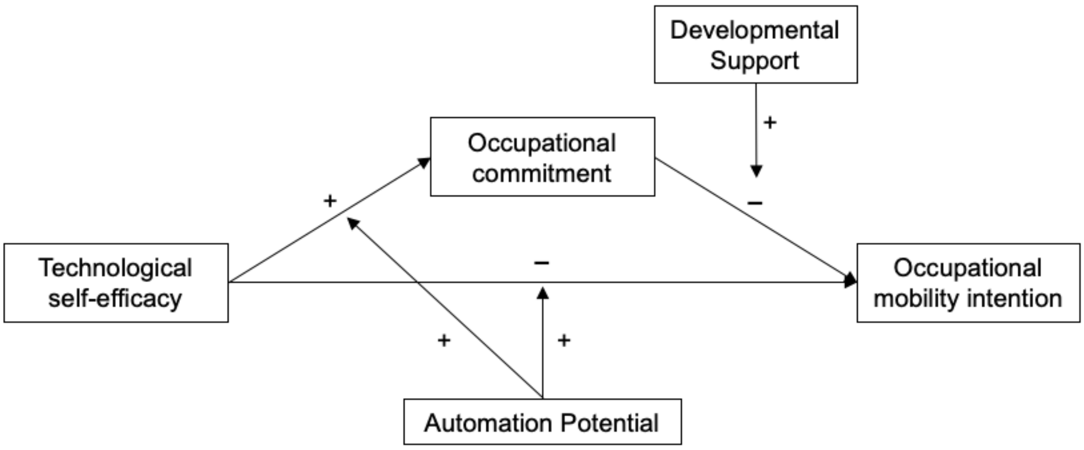

Figure 1. Proposed model, based on SCCT assumptions.

Method

Participants and procedure

As samples drawn from panel providers have recently been shown to be trustworthy in the field of applied psychology (Walter et al., 2019), we conducted an online survey using the services of a panel provider[4] to investigate the proposed relations. Participants obtained a

[4] Talk Online Panel GmbH, Vienna, Austria

small compensation for their participation. To increase validity, we included a validity item in the middle of the survey to make sure participants answered the questions carefully and conscientiously (i.e., “please choose not at all true”). Data from a total of 661 Swiss and German employees were collected at two data points in time (T1 and T2) with a time-lag of about four weeks, starting in November 2019.

For the current study, we only included participants who completed both measurement waves, followed the instruction on the validity item, and provided information on their occupational mobility intention in T2 (*N* = 512), yielding a response rate of 77.6%. The final sample did not contain any missing values after excluding invalid responses. Participants had an average age of 46.7 years (*SD* = 10.7), 54.7% identified as female. 89,3% of participants worked 50% or more, most worked full-time (59.4%). The average occupational tenure was 16.4 years (*SD* = 11.4), the average organizational tenure was 10.6 years (*SD* = 9.7).

Measures

Predictor and outcome variables. *Technological self-efficacy* was measured at T1 using the validated four-item scale by Neyer and colleagues (2012). The five-point Likert scale ranged from 1 = *not at all true* to 5 = *totally true*, a sample item is “It’s hard to deal with new technology – I usually just don’t know how to do it” (recoded item).

Occupational commitment was measured at T2 with 16 items (Felfe et al., 2014). The scale consists of three subdimensions measuring affective, costs, and normative commitment. Items were rated on a five-point Likert scale (1 = *not at all true* to 5 = *totally true*), a sample item is “I’m proud to work in this occupation”.

Occupational mobility intention was measured at T2 with three items by Blau (2000), rated on a four-point Likert scale (1 = *strongly disagree* to 4 = *strongly agree*). A sample item is “I’m currently considering to change my occupation”.

Moderators. *AP* was measured using the online tool developed by Dengler and Matthes (2018)[5]. Following the task-based approach, which indicates the potential to substitute occupational tasks by technology already available today, the tool provides AP scores ranging from 0–100% for every occupation. In the survey, participants selected their occupational field from a drop-down menu (e.g., technical occupations and information sciences, or occupations of the construction industry), and additionally filled in their exact occupational title in an open text box. Unclear responses were discussed within the research team, and as both answers were mandatory in the survey, there were no missing answers. Informed by these two indicators, every participant was matched to an occupation in the tool by Dengler and Matthes (2018), and the respective AP was assigned to the participant. AP is evaluated as low if 30% or less of the tasks can be performed by technology, medium if 31%–70% can be substituted, and high if more than 70% can be substituted (Dengler & Matthes, 2015; Frey & Osborne, 2013). Within our sample, 41.4% of participants worked in low (e.g., nurse), 43.6% in medium (e.g., office clerk), and 15% in high AP occupations (e.g., cashier), respectively. For the analysis, we used the full scale (0–100%).

Developmental support for development was measured with a three item-scale developed by Greenhaus and colleagues (1990) at T1. Items were rated on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*), a sample item is "My supervisor supports my efforts to promote my career through training/further education."

Control variables. To identify the incremental validity of technological self-efficacy, we included occupational self-efficacy as a control variable. Occupational self-efficacy was measured at T1 with a six-item scale (Rigotti et al., 2008). A sample item is "I attain the professional goals that I set for myself", items were rated on a five-point Likert scale (1 = *not true* to 5 = *completely true*). Additionally, because there is a reciprocal relationship between

[5] https://job-futuromat.iab.de/

because occupational mobility intentions and organizational turnover intentions (Chang et al., 2007; Woo & Maertz Jr., 2012), we controlled for organizational turnover intention measured at T2, using the three-item scale by Leiter and colleagues (2011). Items were rated on a Likert scale ranging from *1 = strongly disagree* to *5 = strongly agree*. Finally, gender and chronological age are known to impact the link between occupational commitment and relevant outcome variables like occupational tenure (Spurk et al., 2019). In our sample, gender was significantly correlated with TSE and developmental support, while age was significantly correlated with developmental support and occupational self-efficacy. Therefore, we included both variables as controls.

Data analysis

All analyses were conducted in SPSS 26. To test for the proposed moderated mediation effects (Hayes, 2018), we used Model 22 of the PROCESS macro for SPSS (Hayes, 2013) and conducted 10'000 bootstrap samples. The advantage of this statistical approach is that all study variables and all hypothesized effects can be tested simultaneously.

Results

Means, standard deviations, correlations, and Cronbach's alpha statistics for all measures are reported in Table 1. TSE was negatively related to occupational commitment, occupational mobility intention, and positively related to developmental support and occupational self-efficacy. The results of the analysis testing the full model, including the direct effects and the conditional direct effects are summarized in Table 2.

Table 1

Descriptive statistics and intercorrelations

	M *(SD)*	1	2	3	4	5	6	7	8
1 T1 Technological self-efficacy	4.03 *(0.89)*	*(.89)*							
2 T2 Occupational commitment	3.25 *(0.80)*	–.10*	*(.92)*						
3 T2 Occupational mobility intention	1.87 *(0.89)*	–.18***	–.53***	*(.91)*					
4 Automation potential[a]	40.63 *(28.74)*	.07	–.06	.09*					
5 T1 Developmental support	3.28 *(1.10)*	.10*	.37***	–.33***	–.01	*(.89)*			
6 T1 Occupational self-efficacy	3.87 *(0.68)*	.37***	.20***	–.24***	.00	.35***	*(.88)*		
7 T2 Turnover intention	2.26 *(1.23)*	–.14**	–.53***	.73***	.03	–.33***	–.17***	*(.87)*	
8 Age	46.71 *(10.65)*	–.01	.05	–.07	–.00	–.17***	.12**	–.04	
9 Gender[b]	0.55	–.16***	–.06	.04	.03	–.16***	–.08	.01	.12**

Note. N = 512. Cronbach's alpha reliabilities are reported along the diagonal in parentheses.
[a]0–100% substitutable tasks within occupation
[b]0 = male, 1 = female
*p < .05 **p < .01 ***p < .000

Table 2

Results of moderated mediation analysis.

Predictor	Occupational commitment Coeff.	*SE*	*p*	*LLCI*	*ULCI*	Occupational mobility intention Coeff.	*SE*	*p*	*LLCI*	*ULCI*
T1 Technological self-efficacy	–.26	.06	.00	–.37	–.15†	–.18	.05	.00	–.23	–.08†
Automation potential	–.00	.00	.41	–.01	.00	–.01	.00	.14	–.01	.00
Technological self-efficacy x Automation potential	.00	.00	.47	–.00	.00	.00	.00	.04	.00	.00†
Gender	–.13	.06	.03	–.24	–.01†	–.02	.05	.67	–.13	.08
Age	.00	.00	.86	–.00	.01	–.00	.00	.24	–.01	.00
T1 Occupational self-efficacy	.23	.05	.00	.14	.32†	–.06	.04	.16	–.15	.02
T2 Turnover intention	–.35	.02	.00	–.39	–.30†	.42	.03	.00	.36	.47†
T2 Occupational commitment						–.43	.10	.00	–.63	–.23†
T1 Developmental support						–.23	.09	.01	–.40	–.05†
Occupational commitment x Developmental support						.06	.03	.02	.01	.12†
R^2			.35***					.60***		

Conditional direct effects on occupational mobility intention

Moderator	Effect	Boot SE	*p*	Boot LLCI	Boot ULCI
Automation potential					
low	–.16	.04	.00	–.24	–.08†
medium	–.10	.03	.00	–.16	–.03†
high	–.04	.05	.39	–.13	.05
Developmental support					
low	–.29	.05	.00	–.39	–.19†
medium	–.22	.04	.00	–.30	–.15†
high	–.15	.05	.00	–.25	–.10†

Index of moderated mediation

Index	Boot *SE*	Boot LLCI	Boot ULCI
.00	.00	–.00	.00

Note. N = 512. LLCI = Lower level of the 95% confidence interval, ULCI = Upper level of the 95% confidence interval. Values of moderators in conditional tables are the mean and +/- 1 *SD*. †95% CI does not include zero.
$^*p < .05$ $^{**}p < .01$ $^{***}p < .000$

As proposed in Hypothesis 1, we found a significant negative direct effect of TSE on occupational mobility intention. Likewise, supporting Hypothesis 2, we found that occupational commitment mediated the relationship between TSE and occupational mobility intentions. The results revealed a significant positive indirect effect of TSE on occupational mobility intention via occupational commitment, *ab* = .05, *SE* = .02, 95% CI [.02, .08].

Hypothesis 3a assumed that the positive relation between TSE an occupational commitment would be stronger when AP is high. Contradicting H3a, we found a significant negative direct effect of TSE on occupational commitment, and AP did not moderate this relation, as the interaction term was not significant. Hypothesis 3b assumed that AP moderated the direct relation between TSE and occupational mobility intention, in that the negative relation would be stronger when AP is high. While we found a significant moderating effect of AP, only the slopes for participants in low and medium AP occupations were significant, but not for participants in high AP occupations, as illustrated in Figure 2.

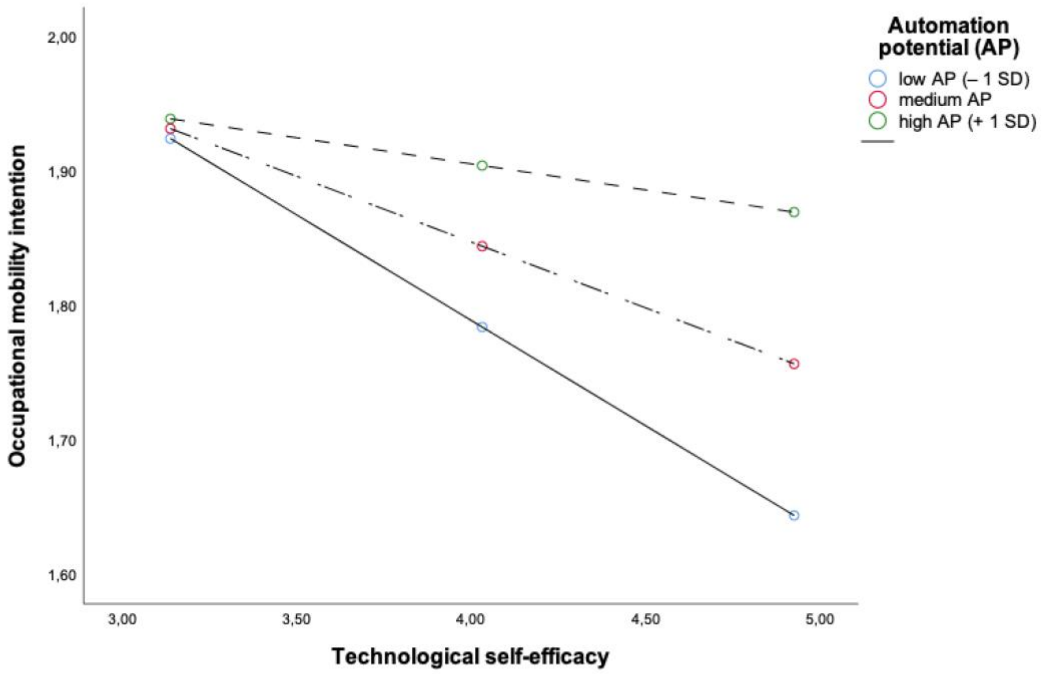

Figure 2. The moderating effect of automation potential on the relationship between technological self-efficacy and occupational mobility intention.

Thus, while TSE predicted occupational mobility intention both directly (Hypothesis 1) and indirectly (Hypothesis 2), the negative direct relation was stronger for employees in occupations with low and medium levels of AP only, contradicting H3b. Therefore, Hypothesis 3 had to be rejected.

Supporting Hypothesis 4, we found that developmental support moderated the negative relation between occupational commitment and occupational mobility intentions. As illustrated in Figure 3, the slope for participants with low supervisor support was steeper than the slope for participants with high supervisor support. High supervisor support thus weakened the negative relation between occupational commitment and occupational mobility intention.

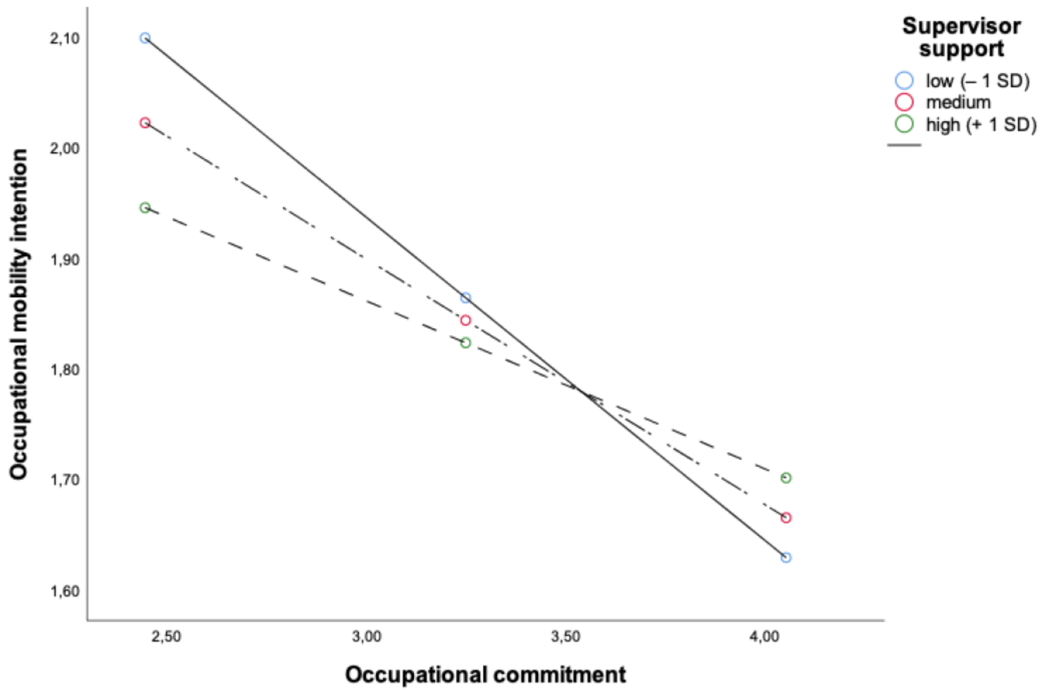

Figure 3. The moderating effect of developmental support on the relationship between occupational commitment and occupational mobility intention.

Finally, in Hypothesis 5, we proposed that occupational commitment partially mediates the relation between TSE and occupational mobility intention, in that AP strengthens the direct effect of TSE on occupational commitment (5a), and developmental support strengthens the direct effect of occupational commitment on occupational mobility intention (5b). As the index for the moderated mediation was not significant, Hypothesis 5 had to be rejected.

Discussion

Technological advancement will most likely not eliminate whole occupations but rather alter and substitute specific tasks and, as a consequence, jobs and occupations across all industries (Arntz et al., 2016; Frank et al., 2019). Therefore, a better understanding of individual and contextual success factors for sustainable careers in response to these changes has been called for (Hirschi, 2018). The first aim of this study was, thus, to investigate which technology-related personal and contextual factors support successful occupational paths. Based on SCCT assumptions, we explored if, and under which conditions TSE influenced occupational mobility intentions. Supporting our hypotheses, we found that TSE was negatively related to occupational mobility intentions, and that occupational commitment partially mediated the relationship between TSE and mobility intentions.

As proposed by SCCT, TSE directly predicted occupational mobility intentions, also after controlling for occupational self-efficacy, and turnover intentions. This result emphasizes the relevance of technology-related self-efficacy for sustained occupational stability and reinforces the need to study self-efficacy belies that are tailored to the specific domain, rather than including "one-size-fits-all" measures (Bandura, 2018, p. 133). The current study thus adds to the limited existing research on TSE and highlight its functional importance for contemporary occupational career trajectories, over and above the more general measure of occupational self-efficacy.

Interestingly, we found that TSE was not positively, but negatively related to occupational commitment. This finding contradicts both basic SCCT assumptions and previous research, that highlight the positive influence of self-efficacy beliefs on occupational commitment (e.g., Klassen & Chiu, 2011). Yet, since occupational commitment primarily focuses on current occupational features and tasks which are likely to change due to digitization and automation (Bessen, 2016), individuals with high TSE might not embrace such a work environment and, thus, reduce their commitment. Unlike most prior research (Meyer & Espinoza, 2016), we included not only affective, but also normative and continuance occupational commitment in our analysis, which both were negatively related to TSE. This means that individuals with high TSE did not feel obligated to remain in their occupations and expected potential occupational mobility not to be costly. Although not central to the current analysis, which focused on the impact of TSE on occupational mobility intentions, these findings lead to the assumption that TSE allows individuals to adaptively deal with technology-related changes within their occupations, but since the occupation itself changes on a task level, the commitment to current occupational features might not be essential for adaptive occupational career trajectories.

The second aim of this study was to examine objective and subjective contextual influences of adaptive career management considering technological advancement. We found that both the objective task-based AP as well as developmental support were relevant for understanding occupational mobility intentions. Yet, while we assumed that the negative relation between TSE and occupational mobility intentions would be stronger for high AP occupations, we found the relation to be stronger for low and medium AP occupations. Our finding thus emphasizes that staying in one's occupation is especially adaptive for individuals with high TSE in occupations that offer some technology-induced change, but not in occupations where most of the established tasks can be substituted by technology. We further found that AP did not moderate the relationship between TSE and occupational commitment. Thus, while AP had some influence on the relationship between TSE and occupational mobility intentions, it seems that other contextual factors might be more relevant for individuals' adaptive career management. Our finding also resonates with employees' overall low concern of being replaced by robots and automation (Brougham & Haar, 2018) and stresses the importance of studying subjective perceptions of digitization-induced change (Schneider & Sting, 2020). Nevertheless, our study provides first insights into how the combination of individual and macro-level variables impact the turnover process (Direnzo & Greenhaus, 2011), at the occupational level.

With regards to more proximal contextual variable of developmental support, we found that such support weakened the negative relation between occupational commitment and occupational mobility intentions, highlighting the role of developmental opportunities for motivation. SCCT emphasizes the importance of environmental supports to set and implement goals for adaptive career behavior and decision making (Lent & Brown, 2013). As updating one's professional skills is considered a critical career-related behavior facing the challenges of technological advances (Hirschi, 2018), support for such adaptive career self-management is highly valued. Our finding also echoes research on employability and occupational expertise, which assumes that learning oriented work environments foster skill development (Van der Heijden et al., 2016). In the context of technological advancement, developmental support appears to be especially important for individuals with low occupational commitment, as the encouragement for learning and up- and reskilling demonstrates that investment in the current occupation is worth the effort, and additionally fosters employability and occupational stability.

Limitations and future research

Two limitations of this study concern the use of an online panel with participants from Switzerland and Germany only. While the use of panel providers is widely accepted (Porter et al., 2019), further studies are needed to examine whether our results generalize to other samples, and different economic and social situations. Furthermore, the current study measured occupational mobility intentions as a proxy for actual mobility. Although studying antecedents of actual occupational mobility has recently gained traction (e.g., Medici et al., 2020), occupational mobility intentions are still frequently used as outcomes when studying individuals' career choices (e.g., Li et al., 2019). Nevertheless, future studies should capture actual mobility in larger longitudinal research designs, taking the ongoing technological advancement and its continuous impact on individuals' careers into account.

One additional limitation concerns the introduction of the objective, task-based measure of AP as a moderator in our model, neglecting the subjective evaluation of technological progress for individual career development. Recently, employees' assessment of automation as a threat has been linked to organizational commitment and turnover intentions (Brougham & Haar, 2018). We therefore encourage future studies to include both objective and subjective measures to account for individual differences in the perception of technology induced change and their relevance for career-related outcomes.

Conclusions and practical implications

Because digitization and automation will impact virtually all occupations (Frank et al., 2019), occupational change cannot be considered an adaptive response to transformed work environments. Nonetheless, technological advancements will sooner or later force most individuals to react to altered occupational environments. To prevent needless occupational mobility, it is crucial to learn about personal and contextual factors which contribute to adaptive career management and support employees in building sustainable occupational career trajectories. This study set out to investigate the influence of TSE on adaptive career self-management in today's dynamic world of work. Using SCCT as a theoretical framework, we demonstrated the incremental validity of TSE over and above occupational self-efficacy, for the prediction of occupational mobility intentions. Furthermore, we found that developmental support by supervisors and the objective, task-based AP of one's occupation influenced how TSE and occupational commitment relate to occupational mobility intentions.

Finally, the present study also offers implications for practice. First, as self-efficacy beliefs are formed through direct and indirect learning experiences (Sheu et al., 2018), TSE is malleable and can be actively addressed through the provision of adequate learning opportunities in organizations, and in continued education. Second, our results suggest that developmental support is relevant for fostering occupational stability. Especially for employees with low TSE and limited occupational commitment, developmental support is important for employees' sustained occupational stability. Leaders should hence actively promote the development of employees' occupational expertise and employability and empower them to adaptively deal with changing work environments.

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