# “How resources generate employee wellbeing: Person-oriented approaches and within-person effects.”

Inauguraldissertation
zur Erlangung des akademischen Grades eines Dr. phil.

vorgelegt dem Fachbereich 02 Sozialwissenschaften, Medien und Sport der Johannes Gutenberg – Universität Mainz

von Christopher Giebe, M.Sc., B.A.
aus Berlin

Mainz am Rhein
2022

Tag des Prüfungskolloquiums: 14.04.2022

## 0.1. Acknowledgements

„If I have seen further, it is by standing on the shoulders of giants."

*– Isaac Newton (1675)*

This dissertation would not have been possible without the support of many, many people. First, I want to thank everyone who has supported me in this effort academically: Thomas, for his guidance and support as my supervisor during this dissertation. I appreciated being able to run by my ideas and receiving thoughtful and valuable feedback throughout the years. To my colleagues, Nina, Miriam, Miriam, Lina, Johanna, Michael, and Verena, who have been supportive and helpful, beyond methodological and conceptual issues. I would be amiss if I did not mention Travis, without whom I would not have started to travel down this path many years ago.

To my family, whose support has made it possible for me to even get to this point. My parents and grandparents, who were always rooting for me. To old friends, who provided the necessary distraction. Especially Niek and Jared, who started their dissertation endeavors before me – and knew exactly the non-academic support a dissertation demands. And of course, to Ingrid, whose patience and optimism has propelled me towards completing this endeavor. Without her, this would have been a much less pleasant experience.

I am grateful to everyone, who may have played even the tiniest of parts.

"Scholars tend to acknowledge but four, generally: water, fire, earth, and air; yet others exist. And it is from these others that comes the immense power […].

Mappo, one is at an immediate disadvantage in discerning a pattern, when one has but four points of reference, with an unknown number of others as yet invisible, unaccounted for in the scheme.

[…] Life, death, dark, light, shadow … possibly, but even that seems a truncated selection. What of, for example, time? Past, present, future? What of desire, and deed? Sound, silence? Or are the latter two but minor aspects of air? Does time belong to light? Or is it but a point somewhere between light and dark, yet distinct from shadow? What of faith and denial? Can you now understand the potential complexity of relationships?"

"Assuming they all exist at all, beyond the notion of concepts."

"Granted. Yet, maybe concepts are all that's needed, if the purpose of the elements is to give shape and meaning to all that surrounds us on the outside, all that guides us from within."

(p.615)

*Excerpt from a conversation between the god Cotillion and the traveler Mappo Runt from "The Bonehunters: Book Six of the Malazan Book of the Fallen" by Steven Erikson*

## 0.2. Abstract

This dissertation entitled "The role of resources in the employee well-being process: Person-oriented approaches and within-person effects" is based on three submitted and/or published peer-reviewed journal articles. The articles in this dissertation revolve around the distinct roles that resources can play in the employee well-being process. Several theories and frameworks in work and organizational psychology revolve around *resources* (i.e., "Those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as the means for attainment of other objects, personal characteristics, conditions, or energies."; Hobfoll and Ford, 2007). As the introduction will describe in further detail, such resources are deemed a vital component in gaining and sustaining psychological wellbeing. However, there are to date many resource-based models and theories about worker wellbeing, all of which propose resources to play distinct roles. For example, resources are proposed to have direct effects on job demands, direct effects on psychological wellbeing, moderating effects on the stressor-strain relationship, or vice versa. This dissertation will investigate several roles resources may be playing in affecting worker wellbeing outcomes, such as mental and physical health, job satisfaction, exhaustion, and work engagement.

The first study considers the direct effects of gaining or losing resources in relation to both mental and physical wellbeing in the context of job changes. As workers may rarely experience such a clear and dramatic change in resources than during quitting or losing a job, this study contributes important insights into how fluctuations in resources can have direct effects on not only mental health, but also physical wellbeing. The results of this study confirmed theoretical assertions that a loss in resources directly coincides with worse health. However, the results also include important nuances, as a subgroup of job changers seemed to have been able to "invest" some resources, i.e., reporting better health outcomes despite a worsening in some resources. Nonetheless, resource loss was associated with a worsening in wellbeing – and to a greater extent than resource gain was associated with improving wellbeing.

The second article investigates how resources can be used to alter the work environment to gain further resources and foster employee motivation. This process of individual-driven changes to the work is called job crafting and may allow a worker to alter their work characteristics in a way that is beneficial to wellbeing. This study investigates how a personal resource can be used to gain additional resources through the process of job crafting. Using a person-centric approach, the results of this study showed that a subgroup high in levels of this personal resource engaged in the most effective type of job crafting – which was also associated with the highest levels of work engagement. While reciprocal relationships, such as "gain cycles", have been proposed by theoretical work, this article the results of this article extend such thinking by the mechanism of job crafting. The results suggest that it may be possible to "spend" a personal resource to gain job/social resources, which in turn can increase eudemonic wellbeing.

Finally, the third article does not propose a direct effect of resources on wellbeing outcomes or proposes that one resource can influence the acquisition on additional resources but focusses instead on how resources can mediate the effect of challenging job demands on worker wellbeing. Fulfilment and thwarting of the basic psychological needs for autonomy, mastery, and relatedness was shown in this study to be one potential mechanism by which challenging job demands like time pressure and job complexity can affect worker wellbeing. Through the satisfaction of the need for competence, in weeks in which a job was reportedly more complex, emotional exhaustion was lower. Satisfying basic psychological needs could potentially catalyze the resource-like aspects of challenge demands.

In addition, each article takes a within-person or person-oriented perspective, adding methodological consideration about the effects of resources on employee well-being.

Taken together, the three articles highlight the potential complexity of relationships in the work stress and wellbeing process. From direct effects, to mediating effects, to fostering further resource acquisition, the studies showed that resources can play several crucial roles in the

process. These studies have implications for resource-based theories of workplace stress/wellbeing and contribute new evidence as to how resources function to affect worker wellbeing.

## 0.3. Zusammenfassung

Diese Dissertation mit dem Titel „The role of resources in the employee well-being process: Person-oriented approaches and within-person effects“ basiert auf drei eingereichten und/oder veröffentlichten peer-reviewten Zeitschriftenartikeln. Die Artikel dieser Dissertation durchleuchen verschiedene Rollen, welche Ressourcen im Mitarbeiterwohlbefindensprozess spielen können. Mehrere Theorien und Ansätze in der Arbeits- und Organisationspsychologie stellen *Ressourcen* in ihren Mittelpunkt (also jene Objekte, persönlichen Charakteristika, Umstände, oder Kräfte welche das Individuum wertschätzt, oder welche zum Zugewinn weiterer Objekte, persönlicher Charakteristika, Umstände, oder Kräfte verwendet werden können; definition nach Hobfoll und Ford, 2007). Wie die Einleitung noch detaillierter darstellen wird, stellen solche Ressourcen einen wichtigen Baustein zum Gewinn und Erhalt psychischer und physischer Gesundheit dar. Allerdings finden sich in der Literatur viele ressourcenbasierte Ansätze und Theorien zur Mitarbeitergesundheit, welche Ressourcen unterschiedliche Rollen zuweisen. Zum Beispiel wird oft angenommen, dass Ressourcen einen direkten Effekt auf das psychische Wohlbefinden oder puffernde Wirkungen auf die Auswirkungen von Stressoren haben können. In dieser Arbeit werden drei Rollen, welche Ressourcen im Gesundheitsprocess im Arbeitskontext haben können, und deren Auswirkungen auf mentale und physische Gesundheit, Arbeitszufriedenheit, Erschöpfung und Arbeitsengagement untersucht.

Die erste Studie betrachtet die Auswirkungen von Ressourcengewinnen und Ressourcenverlusten auf mentale und physische Gesundheit im Kontext for Arbeitsplatzwechseln. Da Fluktuationen von Ressourcen wohl am extremsten beim Arbeitsplatzwechsel auftreten, leistet diese Studie einen Beitrag darin, die direkten Effekte von Ressourcen auf mentale und physische Gesundheit zu betrachten. Die Ergebnisse bekräftigen theoretische Annahmen, dass Ressourcenverluste mit schlechterer Gesundheit einhergehen. Allerdings schien eine Subgruppe an Jobwechlern auch trotz einer annehmlichen

Verschlechterung einiger Ressourcen positive Effekte erlebt zu haben, indem sie einige ihre „eingebüßten“ Ressourcen „investiert“ haben und somit anderwaitige positive Effekte für ihre physische Gesundheit erzielt haben. Nichtsdestotrotz war der Ressourcenverlust vor allem mit einer Verschlechterung assoziiert – und dass zu einem größeren Ausmaß als das der Ressourcengewinn mit einer Verbessung der Gesundheit assoziiert war.

Die zweite Studie untersucht, wie Ressourcen verwendet werden können, um das Arbeitsumfeld zu verändern, und dadurch weitere Ressourcen zu gewinnen und die Mitarbeitermotivation zu fördern. Eine persönliche Ressource kann demnach genutzt werden, um weitere Ressourcen durch Job Crafting zu gewinnen. Diese Studie zeigte, das seine Subgruppe, welche sich durch ein hohes Maß an Psychologischem Kaptital auszeichnete, effektiv Job Crafting betrieben – und mit den höhsten Werten an Arbeitsengagement assoziiert waren. Während Theorien und Modelle oft reziproke Beziehungen, wie z.B. Gewinnspiralen und Verlustspiralen, annehmen, ziegen die Ergebnisse dieser Studie, dass Job Crafting ein Prozess der Ressourcengewinnung und zur steigerung des Arbeitsengagements darstellen kann. Die dritte Studie betrachtet nicht die direkten Effekte von Ressourcen auf das Wohlbefinden oder wie Ressourcen den Gewinn weiterer Ressourcen beeinflussen können, sondern wie Ressourcen die Auswirkungen anspruchsvoller Arbeitsanforderungen auf das Wohlbefinden der Mitarbeiter vermitteln können. Die Befriedigung psychologische Grundbedürfnisse nach Autonomie, Kompetenzerleben und Zugehörigkeit wurde in dieser Studie als ein möglicher Weg aufgezeigt, in dem anspruchsvolle Arbeitsanforderungen wie Zeitdruck und Arbeitskoplexität das Mitarbeiterwohlbefinden beeinflussen. In Wochen in denen die Arbeit als Komplex eingeschätzt wurde, konnte durch die Befriedigung des Bedürfnisses nach Kompetenzerleben die emotionale Erschöpfung am Arbeitsplatz gesenkt werden. Die Befriedigung der psychologischen Grundbedürfnisse könnten also förderlichen Aspekte anspruchsvoller Arbeitsanforderungen katalysieren.

Darüber hinaus nimmt jeder Artikel eine personenbezogene oder personenorientierte Perspektive ein und leifert einen Beitrag zum Verständnis der Auswirkungen von Ressourcen auf das Wohlbefinden der Mitarbeiter auf Personenebene.

Zusammengenommen zeigen die Artikel die potenzielle Komplexität der Rollen auf. Von direkten Effekten auf die Gesundheit, über vermittelnde Effekte, hin zur Unterstünzung der Gewinnung weiterer Ressourcen, zeigten Ressourcen einen Einfluss auf den Mitarbeitergesundheitsprozess. Zusammen haben die Studien in dieser Dissertation Implikationen für ressourcen-basierte Theorien zu Mitarbeitergesundheit, welche im Folgenden detaillierter durchleuchtet werden.

## 0.4. Contents

### 0.4.1. List of Tables



### 0.4.2. List of Figures

## 0.5. Preface

All three articles were conceived of and written primarily by me. However, since Prof. Dr. Thomas Rigotti contributed substantially to the generation of the articles, the articles will refer to the authors in plural pronouns. Lists of tables and figures have been adjusted while reprinting the manuscripts in this dissertation. Since the journals at which the articles have been published follow different citation guidelines, the citation styles in the reprints have been unified to follow APA 7$^{th}$ edition style.

# 1. General introduction

### 1.1. The modern workplace: A source and a drain for wellbeing

In the last decades, demands on workers have increased through an intensification of work (Kubicek, 2017). The researchers note that workers must fulfill more work tasks throughout the day, meet tighter deadlines, and have higher performance expectations placed upon them than in the previous decades. Simultaneously, they report an increased interdependence between workers and their jobs, such that modern workplaces depend more on workers to act autonomously to perform complex jobs. In other words, today's jobs require an individual's personal resources such as creativity, drive, or organizational skills to perform jobs adequately. Monotonous and repetitive jobs with employer-controlled processes are increasingly outdated. Crises such as the COVID-19 pandemic have made such intensification abundantly clear, as the conditions in hospitals and other caregiving institutions have been shown to lead to diminished mental health in health care workers (Britt et al., 2020; Vindegaard & Benros, 2020). Beyond healthcare workers, the closure of schools forced many working parents to double their roles as employees and teachers simultaneously, forcing them to find new strategies to work and co-parent (Shockley et al., 2021). As a result, analyses of VPN log-in data showed an increase in the number of hours that people have put into work in some countries (Osbourne, 2021). Initial research indicates that the increased demands are resulting in higher levels of burnout compared to the year before (Hayes et al., 2020) and that a decline in psychological wellbeing was found in the general public (Vindegaard & Benros, 2020).

In the face of ever increasing demands, it becomes imperative for scientists and practitioners to understand the forces and factors of work that not only protect workers against psychological and physical harm (Hackman, 1980), but also allow workers to thrive (Kleine et al., 2019) and become engaged in their work (Lesener et al., 2020). Current research has shown that workplaces designed to foster resources such as training, recognition and feedback from supervisors, autonomy/control (Cotel et al., 2021), as well as technology resources (Jamal et al., 2021) resulted in better health and wellbeing outcomes for workers. Explicit calls for a

better understanding of deleterious and protective factors in worker wellbeing have grown as well (Maslach & Leiter, 2017). General stress theories, such as the Conservation of Resources Theory (COR; Hobfoll, 1989; Hobfoll et al., 2018) or the Adequacy of Resources Framework (Bacharach & Bamberger, 1995) offer frameworks with which to investigate and understand these generative/positive characteristics of the job or person (i.e., resources) – and how these characteristics help to achieve workers' psychological wellbeing, motivation, and performance. While resources have been identified as crucial in this process (Demerouti et al., 2017; Hobfoll et al., 2018), much remains unclear about the roles resources play in the worker wellbeing process. Different theoretical models propose distinct roles in the wellbeing process, and some even propose multiple roles in the same theoretical framework. For example, models propose a direct effect on wellbeing outcomes, as resources counteract and offset the effects of demands (e.g., Demerouti et al., 2001) and/or moderate the effects of demands (e.g., Bakker & Demerouti, 2017). Despite effects on outcomes, resources may also have effects on other related processes such as stressor cognition/appraisal and coping processes (e.g., Zapf et al., 2018). Furthermore, review articles have proposed resources to play vital functions in general wellbeing (Lightsey, 1996) and motivation in organizations (Quinn, Spreitzer, & Lam, 2012). However, the myriad of proposed models begs the question which roles resources can play. While an exhaustive investigation of all proposed roles is not possible in the scope of this dissertation, the studies that make up this dissertation will investigate some roles that resources may play to allow individuals to thrive at work and to mitigate potential mental and physical harm from demands at work. This dissertation will investigate the role of resource gains and losses, how a personal resource can influence further resource generating strategies (i.e., job crafting, Wrzesniewski & Dutton, 2001), and will describe how basic psychological needs (Ryan & Deci, 2000) can explain the relationship between challenging work characteristics and wellbeing outcomes. By investigating distinct roles that resources can play in the wellbeing process, this dissertation highlights the need for a more thorough understanding of resources in

common workplace stress and wellbeing theories. This work presumes resources to serve three distinct roles, which all seem plausible in current theories and frameworks. Taken together this research highlights the need for more concise and precise theories regarding the role of resources in the worker wellbeing process.

Before one can gain a deeper understanding of the role of resources, this general introduction will first provide a rough overview of the development of the understanding of worker wellbeing in the last century. Next, this introduction will elaborate on the construct of recourses, their definition and meaning, followed by an (arguably incomplete) overview of the roles that resources have been proposed to play in the literature to date. Finally, this chapter will conclude with an elaboration on the need for person-centric and within-person perspectives in the investigation of resources and their role in the worker wellbeing process.

### 1.2. The development of theory to understand worker wellbeing

Workplace stress has been defined as the "process by which workplace psychological experiences and demands (stressors) produce both short-term (strains) and long-term changes in mental and physical health" (Ganster & Rosen, 2013, p. 1088). However, stress is not a single variable, but more of an organizing concept or a rubric for understanding a wide range of phenomena in human and animal adaptation (Lazarus & Folkman, 1984; Selye, 1975). Such a broad definition underscores the complexity of the relationships involved and is not a carte blanche to use the definition haphazardly. Instead, it implores the research community to systematically examine the concept at multiple levels, to develop theory, and postulate predictors, mechanisms, and outcomes. Before one can do so, however, one needs to understand the evolution of our understanding of the stress process. The following paragraphs will therefore provide a severely truncated survey of how the field has developed.

The concept of stress has been around for centuries in one form or another. Mechanical models of the 18th and 19th century adopted the term related to force, load, and distortion (Hinkle,

1974). Stress was defined as the ratio of an internal force to the area over which a force acted. Strain denoted the amount of distortion the object experienced due to the stress.

Many of the roots in natural and physical science of the terminology around stress and wellbeing research are still discernable today. For example, concepts such as cognitive load (Gaillard, 1993) and the strain-path of the Job Demands-Resources Model (JD-R) (Bakker & Demerouti, 2017) reflect the physical origins of our thinking about stress in human beings.

Early in our understanding, stimulus-response definitions of stress posited that environmental ques and external stimuli (nowadays referred to as stressors; Selye, 1975) possess an innate noxious potential, which will cause the organism to respond (Seyle, 1936). Such stimuli range from acute but time-limited events like human-made catastrophes and natural disasters, to chronic demands, which are not a discrete event and continue over longer periods of time (Dewe & Cooper, 2017; Kanner et al., 1981; Semmer & Zapf, 2017). The quintessence of this understanding of stress was that human physiology is organized around the concept of homeostasis (Cannon, 1929) – and stress was conceptualized as the deviation from homeostasis due do external stimuli. Later, the concept of homeostasis developed into the concept of allostatic load in order to encapsulate the phenomenon of shifting to new levels of homeostasis after exposure to stimuli (McEwen & Seeman, 2003). The authors describe several ways in which such dysregulation of the human physiology can occur: (1) constant exposure to new stimuli may overwhelm the system, such that adaptation simply is impossible, (2) the system may not habituate to the stressor and the reaction simply weakens despite the levels of stressors remaining steady, (3) the system may simply not recover but remain in a hyper vigilant and prolonged response, and (4) the system may simply not respond or do so inadequately to the stressor.

Born out of a critique of the stimulus-response definitions, the relational/transactional definitions of stress criticized that stress seldomly resides entirely within the environment. Only a few extreme conditions can be inherently noxious without consideration of the organism

experiencing it (Dewe et al., 2012; Dewe & Cooper, 2017; Semmer & Zapf, 2017). For example, while a sulfur and nitrate rich environment would be the definition of a noxious environment for humans, it is the ideal environment for some microbial life (Wuethrich, 1999). While there may be "universal stressors" (such as military combat, natural disasters, torture, etc.), the relational definition of stress focuses on more ambiguous conditions where the inconsistency of the response to a stimulus grows greater.

In occupational research, Person-Environment Fit (P-E-Fit; French et al., 1982; Parsons, 1909) took a step away from the inherently noxious potential of the environment and proposed that stress resulted from the goodness-of-fit between the person and the environmental demands. This fit (or congruence, or correspondence, or match) was postulated to have two components: (1) the demands-ability fit, which described the degree to which the environmental demands at work measure up to the degree to which employees have the abilities to meet them, and (2) the needs-supply fit, which describes the degree to which the employees physical and psychosocial needs are available to them. Stress was therefore the result of a mismatch between the person (their abilities and needs) and the environment (the job's demands and resources supplied). For example, Joseph Edward McGrath (1970)(1976) proposed a model of stress and performance that explicitly considers experienced stress (ES) as the perceived consequences of not meeting demands (D) multiplied by the demands-ability misfit (D-A), where a constant (K) indicates the base level of arousal an organism experiences:

$$ES = C\ (K - |D - A|)$$

This concept, that the stress process was inherently relational, or transactional, between the person and the environment became the foundation for more modern theories of occupational stress, such as the transactional model by Lazarus and Folkman (1984), which posits that "psychological stress is a particular relationship between the person and the environment, that is appraised by the person as […] exceeding [their] resources and endangering [their] well-being" (p.17). As stress began to be understood as a transactional process, it became clear that

researchers also needed to develop a more precise understanding of its consequences. The term psychological wellbeing has been defined as "subjective experience and functioning" (Grant et al., 2007) and has gained increasing attention in occupational research as an important outcome (Ganster & Rosen, 2013). Inceoglu et al. (2018) further categorize wellbeing as (1) hedonic wellbeing, which emphasizes subjective perceptions of pleasure, (2) eudemonic well-being, which emphasizes subjective vitality (Gallagher et al., 2009; Warr, 2012), (3) negative wellbeing, such as burnout and exhaustion, and (4) physical wellbeing, such as sleep quality. Through this conceptualization, the deficit focus of earlier theories (i.e., the primary focus on negative wellbeing) became part of a more holistic understanding of the stress process in human beings.

The evolution of the understanding of stress as a transactional process and wellbeing as a holistic construct, highlights again the potential complexity of the relationships involved when attempting to describe, understand, and explain such rubrics/phenomena. As (worker) wellbeing seems not to be a single variable or simple set of relationships between a handful of variables, the thinking about stress phenomena has also evolved to include further concepts (such as resources) to help explain the complicated effects and relationships observed by researchers and theorists.

### *1.2.1. The emergence of resources as key concepts in understanding worker wellbeing*

As Hobfoll (2002) suggests, around the second half of the twentieth century, researchers stopped focusing solely on negative consequences and illbeing – but also developed an interest in those factors that allow individuals to stave off and cope with demanding circumstances. For example, Nuckolls et al. (1972) reported that so called "psychological assets" were associated with less complications during pregnancy when women experienced "high cumulative life changes" (p.431). Eventually, these factors were termed resources and several "resource models" for the understanding of psychological health and well-being emerged. Initially, resource theories of wellbeing proposed several "key resources" that are necessary in order to

successfully handle stressful demands (Hobfoll, 2002). Factors such as control (Skinner, 1996) or self-efficacy (Bandura, 1982) were believed to be the primary forces by which individuals mounted a robust stress response. However, as Rini et al. (1999) showed that key resources such as self-efficacy and optimism are correlated and interchangeable, a few resources could unlikely be considered to be the key to psychological health and wellbeing. Instead, Hobfoll (2002) describes the emergence of "integrated resource models", which posit that resources are "part of a greater dynamic process associated with wellbeing through the general use of resources" (p.311). In these models, resources were rather broadly defined and consider a wide range of possible protective factors instead of only a few "key resources". Hobfoll (2002) argues that influential stress models, such as the transactional stress model (Lazarus & Folkman, 1984) and P-E-Fit (French et al., 1982) could also be considered integrated resource models, as for example the transactional stress model contains an implied assessment of an individual's resources to cope with a demand, which determines the individual's stressor appraisal. Similarly, as Wheeler et al. (2013) note, the interaction between the resources within the person and the environment also determine the fit or misfit - and therefore also implicitly integrate resources into the model. Based on these theoretical backgrounds, COR emerged as another integrative resource model (Hobfoll, 1989). According to COR, resources are defined as anything physical or mental one believes to be helpful in overcoming said threatening external stimuli. The basic tenet of COR is that stress occurs, when (1) a person fears that the resources they possess are not enough to overcome the external adversity (i.e., demands-ability misfit in P-E-Fit) or (2) that the external stimuli threaten the loss of resources consequently (i.e., needs-supply misfit). As a result, people "strive to obtain, retain, foster, and protect those things they centrally value" (Hobfoll et al., 2018, p. 104). Stress is therefore the person's reaction to the actual loss, perceived loss, or threat of loss of resources. From this perspective, P-E-Fit could be conceptualized as a resource itself (Wheeler et al., 2013). Resources such as optimism and social connection have been associated with better physical health in a 10-year

follow-up study (Segerstrom, 2007) and receiving public assistance and social support during unemployment has been linked to less severe effects of job loss (Kessler et al., 1988) and COR has been studied in the context of job performance and burnout (Wright & Hobfoll, 2004). Beyond this basic tenet, the theory also contains several principles and corollaries, which make more precise assertions on the effects and processes of resource gains and losses.

The primacy of resource loss principle, for example, incorporates the negativity bias (Tierney & Baumeister, 2019) and prospect theory (Kahneman & Tversky, 1979) and postulates that et ceteris paribus, the loss of resources will have more detrimental effects on wellbeing than an equal amount of gain in resources will have positive effects. Such effects were shown in a meta-analysis by R. T. Lee and Ashforth (1996), who reported that the effects of deteriorative working conditions such as high workload were more strongly related to burnout than resource variables.

The resource investment principle holds that resources can be used to gain further resources. This process has been found in regards to outcomes such as job performance (Park & Lee, 2015), absenteeism (van Woerkom et al., 2016), and safety behaviors (Halbesleben, 2010b). And even if the loss of resources cannot be reversed, resource investment may slow down the rate of total resource loss (Hobfoll et al., 2016). However, resource investment can also be a risky endeavor. If the return of investment does not materialize, the net loss of invested resources at work can predict physical health outcomes such as stroke and heart attacks as well as objective biomarkers like hypertension and ventricular hypertrophy can (Siegrist et al., 1992).

The gain paradox principle proposes that resource gains become particularly salient in situations marked by resource loss. This has also been shown in the literature, as the interaction between demands and resources (particularly in conditions with high demands and high resources) produces high motivation along with average strain as outcomes (Bakker & Demerouti, 2007; Xanthopoulou et al., 2007). More recently, a study by Vashdi et al. (2020)

found that team interdependence was an important resource in emotional states such as depression, loneliness, and powerlessness during a COVID-19 lockdown. These studies highlight the salience of resources in trying times.

The desperation principle predicts that individuals that have lost too many resources will take on defensive positions (i.e., become aggressive and irrational). Many studies have shown such effects, especially regarding social interactions at work. For example, resource depleted managers have been shown to become more likely to engage in abusive supervision (Yang et al., 2020) or depressed employees returning to work after a COVID-19 lockdown displayed higher levels of maladaptive coping strategies (Vashdi et al., 2020).

Furthermore, COR proposes that resources tend to be interrelated and form resource caravans (Hobfoll, 2011) and should not be considered in isolation from each other. For example, nurturing environments (i.e., resource caravan passageways) should not only produce one resource such as self-efficacy, but also related resources such as optimism and self-esteem (Holmgreen et al., 2017). Adler and Newman (2002) investigated the impact of socioeconomic factors on health outcomes and noted that socio-economic status and income were correlated – and therefore "travel together" as resource caravans when impacting health outcomes. In the context of occupational research, studies have investigated, how feedback-seeking in employees can create resource caravans that lead to creativity at work (Sung et al., 2020).

Finally, COR contains several corollaries, which propose that individuals who already possess lots of resources are less vulnerable to resource loss, and that both resource gains and losses can enter reciprocal cycles (i.e., gains and loss spirals). Many studies investigated these corollaries after severe disasters such as hurricanes (Paul et al., 2014) and terror attacks (Littleton et al., 2009). These studies showed that starting at an elevated level of initial resources may offer some protection from resource loss, while starting at a lower level of resources makes people more likely to experience more resource loss in the future.

Through the mechanisms described above, COR represents a process theory, rather than a content theory. While Hobfoll (2001) did create a list of 74 resources that are involved in the stress process, COR prescribes a more general, perhaps "middle range" (Wheeler et al., 2013), theory of how resources are involved, as opposed to which resources specifically (unlike the Job Demands-Control Model; Karasek, 1979). With COR, the conversation in stress theories shifted slightly away from environmental/external stressors alone and the interaction with resources became a central aspect of stress and wellbeing concepts as well. The studies that comprise this dissertation will rely heavily upon said early research into resources as key concepts in wellbeing.

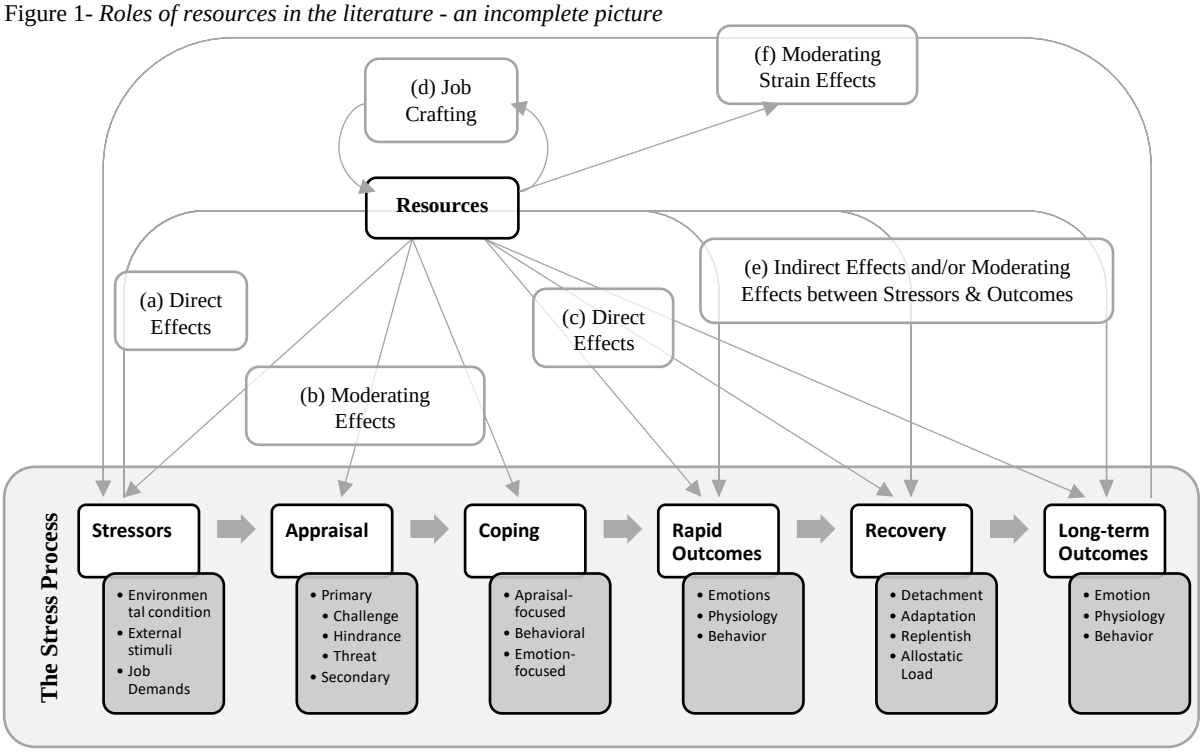
### 1.3. The role of resources in worker wellbeing

As the brief review above highlights, the conceptualization of stress as a wide rubric of phenomena makes trying to understand these phenomena a complex endeavor. With the current state of research having arrived at transactional models of stress and integrated resource models to describe and explain the relationship between people and their (work) environment, many questions about the particular mechanisms remain (Iavicoli & Di Tecco, 2020; Somerfield & McCrae, 2000). Much of the research since the new millennium has focused on the role that job demands may play in the work stress and wellbeing process, for example, a meta-analysis on strain (Darr & Johns, 2008), a review on the allostatic load model (Ganster & Rosen, 2013), a meta-analysis on the challenging aspects of job demands (LePine et al., 2005), or a longitudinal meta-analysis in job demands and resources (Lesener et al., 2019). However, with integrated resource models, resources have flourished in research on work stress phenomena in the new millennium as well (Hobfoll et al., 2018; Nielsen et al., 2017; Xanthopoulou et al., 2007). The reasons for the "newfound" interest in resources may be manifold (see Luthans & Avolio, 2009 for a discussion on how this idea is admittedly not so newfound). One reason could be that the happy/productive worker hypothesis (Cropanzano & Wright, 2001) led to the proliferation of positive psychology research in organizational and occupational psychology (Donaldson & Ko,

2010) According to Dutton et al. (2006), positive organizational psychology (POP) distinguished itself from other fields by focusing on the generative dynamics within people and workplaces, rather than focusing on deficiencies and malfunctions. So, rather than focusing solely on stressors and demands, POP enhanced the focus on those aspects of working-life that deal with optimal performance, thriving, strengths, capacity-building, work engagement and wellbeing as well. One reason for the focus on generative processes within POP is the core assumption that the mere elimination of stressors/demands may reduce strain, but is not enough to generate positive work states such as thriving and work engagement (Gorgievski et al., 2011). Furthermore, research has shown that negative events tend to have more detrimental effects on people than positive events (Fredrickson & Losada, 2005; Tierney & Baumeister, 2019), an idea that was also incorporated in to COR through the primacy of resource loss principle. The focus on resources may therefore offer a counterweight, calling attention to the importance of strengthening and bolstering the positive. This idea of creating a balance between demands and resources is at the center of the JD-R (Bakker et al., 2010; Demerouti et al., 2001), which poses that optimal performance and flourishing is possible when both challenging demands and resources are abundant and that resources can be used to buffer the straining effects of demands that are too high. In other words, the JD-R picks up on the demands-ability person-environment fit incongruency idea (Bakker & Demerouti, 2007). This idea of resource congruence was not new at the time, as Wong (1993) proposed it as a necessary condition for effectively dealing with life stress in other domains than work and was extended by DeJonge, Dormann, and van den Tooren (2008). Nonetheless, lots of research has investigated the JD-R as a model of the stress process over the last couple of decades (Bakker & Demerouti, 2017). For example, Mäkikangas et al. (2010) explicitly link resources to flow experiences at work, since flow is only possible at the border of high challenges meeting an abundance of abilities (Llorens et al., 2013). Tadić et al. (2015) investigated the moderating role resources can have on job demands and wellbeing outcomes. Additionally, Nielsen et al. (2017) conducted a meta-analysis and

showed that resources were related to wellbeing and performance, at the individual, group, leader, and organizational levels. This mirrored earlier meta-analytic evidence linking resources to work engagement at the individual level alone (Crawford et al., 2010; Halbesleben, 2010a). However, the above-mentioned articles focused on the role that resources play in the JD-R, while other investigations using different theoretical backgrounds proposed various roles in the stress process to date. For example, Grover et al. (2017) proposed and report that in their study, the personal resource PsyCap (Luthans, Youssef, & Avolio, 2007) was found to play several roles, such as (1) having a direct effect on psychological wellbeing and (2) work engagement, while simultaneously (3) being related to perceptions of job demands, as well as other (4) job resources. While authors seldomly ascribe so many roles to resources in one single study, this exemplifies a literature that contains many ways in which resources are believed to affect wellbeing. Figure 1 presents an incomplete summary of the roles that resources have been proposed or found to play in the stress process.

Figure 1- *Roles of resources in the literature - an incomplete picture*




The path labeled (a) represents the COR process of resource depletion, which proposes that stressors have a direct effect on the available level of resources (Halbesleben et al., 2014;

Hobfoll, 2002). Meta-analytic evidence supports that job stressors substantially deplete workers resources (Halbesleben, 2006; Park et al., 2014) The paths labelled (b) and (c) are based on work by Schaufeli and Taris (2014) and Zapf et al. (2018), who reviewed the literature and found resources to have been proposed to have moderating effects on stressors, the stressor appraisal, as well as coping mechanisms. Furthermore, resources have been conceptualized to have direct effects on outcomes (such as the motivation path of the JD-R) and the recovery process. On path (d), according to the resource investment principle of COR (Hobfoll et al., 2018), resources can be used in order to gain more resources, which in turn lead to better consequences. One such process of investing resources could be job crafting (Wrzesniewski & Dutton, 2001), i.e., the process by which employees make changes to their working conditions in order to remedy P-E-misfit. Additionally, on path (e), Xanthopoulou et al. (2007) found that personal resources mediated between job resources and work engagement. Recently, a meta-analysis by Guthier et al. (2020) investigated the reciprocal effects that outcomes such as burnout can have on job stressors - path (f). The authors found that strain effects (i.e., the effects of outcomes on the perception of stressors) were moderated by resources. Interestingly, the interaction effects on the reciprocal strain effects were stronger than the buffer hypothesis of the JD-R proposes on the strain path. The authors propose a "reformulated" safety hypothesis, meaning that employees suffering from diminished wellbeing perceive stressors as a potential threat and consequently react more severely. This seems to be in line with the before-mentioned primacy of resource loss principle of COR (Hobfoll et al., 2018). Nonetheless, although resources have been called "central to the coping process" (Dewe, 2017, p. 438), the mechanisms by which workers stave off detrimental effects and foster positive states remains largely enigmatic. One might say that the role of resources in these processes is "in need of further exploration" (Crane, 2021, p. 471), and this dissertation attempts to head at least part of that call by investigating the roles of resources as predictors, mediators, and catalysts for further resource acquisition in the stress and worker wellbeing process.

### *1.3.1. Within-person and person-orientated approaches*

Overall, when it comes to the stress and coping process, the literature shows resources to be an important part of the equation. Resources have been proposed and found to play many distinct roles in this process as outlined above. The studies that make up this dissertation will each highlight a different role that resources can play. Additionally, as a review of the literature by Ilies et al. (2015) points out, much of the literature focused on between-person effects of demands and resources in the past. In other words, worker wellbeing was often conceptualized as stable outcomes that differ only from person to person. However, as Ilies et al. (2007) point out, methodological and conceptual advances have allowed for the investigation of worker wellbeing outcomes as fluctuating states that differ intra-individually (e.g., state work engagement; Sonnentag et al., 2010; or state job satisfaction;. Ilies & Judge, 2002).

Furthermore, "traditional" between-person variable-centric investigations of the stress process assume a homogeneous population of effects. For example, a study of between-person effects of how a resource predicts worker wellbeing might assume that individuals come from a single population and that the regression effects of the resource on wellbeing outcomes are the same for everyone within the studied population. Person-oriented approaches, such as finite mixture modelling (McLachlan et al., 2019) on the other hand allow for the possibility that the population is not homogeneous, but that there could be heterogeneous subgroups within the population (i.e., latent classes or latent profiles; Jung & Wickrama, 2008). As a recent review by Spurk et al. (2020) shows, person-centric approaches have been used to study job and organizational attitudes and behaviors, work motivation, and work environments amongst other things. In the realm of worker wellbeing, Bujacz et al. (2020) investigated different types of wellbeing among the self-employed, and Mayerl et al. (2017) used this approach to cluster types of work demands and related those clusters to health outcomes. Nonetheless, there remains much to be contributed to the theoretical and practical understanding of worker wellbeing by taking a person-centric and within-person perspective (Spurk et al., 2020).

The studies that make up this dissertation will investigate the roles that resources play on the intra-individual level and using person-oriented and multilevel approaches. Specifically, the three studies will investigate paths (c), the direct effects of resources on worker wellbeing, (d), the role of resources as prerequisites of gaining more resources and leading to positive worker outcomes, and (e) resources as mediators between demands and outcomes, illustrated in Figure 1.

Study 1 "A typological approach of perceived resource fluctuations after job transitions in a representative panel study" investigates the directs effects that gaining or losing resources as a consequence of changing jobs can have on mental and physical health, using a person-oriented approach. This study builds upon evidence from variable-centric studies that showed resources such as emotional competencies (Lorente et al., 2008), self-efficacy, optimism, self-esteem (Xanthopoulou et al., 2009), psychological safety climate (Idris et al., 2014), transformational leadership at the leader level (Breevaart, Bakker, Demerouti, et al., 2014; Breevaart, Bakker, Hetland, et al., 2014) or feedback and social support at team levels (Costa et al., 2015) have an impact on individuals' performance, motivation, and wellbeing. Using a person-oriented approach, this study will investigate the basic tenet of COR, that resource gains and losses are the key to sustaining health and wellbeing. Additionally, as this study contains six resources, it will allow insights into COR's proposed formation of resource caravans. This study showed resources (and especially the gains and losses thereof) to have to direct effects on worker mental and physical health. It thereby contributes a unique person-oriented perspective on the role resource acquisition, retention, and loss play in the wellbeing process.

As the title of study 2 "The role of Psychological Capital in weekly job crafting profiles and their relation to work engagement: A person-oriented study" suggests, continues this manuscript with a person-centric investigation of how individuals use/invest resources to gain more resources, and what the effects of those strategies are on work engagement. Both COR and the JD-R posit gain and loss spirals (Bakker & Demerouti, 2017; Hobfoll et al., 2018) in

which individuals could shape their own work environment in order to generate more resources, decrease demands, and in turn, improve outcomes. Hobfoll (2002) noted the importance of researching how resources are derived from each other. A review of the literature by J. Y. Lee and Lee (2018) found the personal resource PsyCap to be an antecedent of job crafting and linked job crafting to work performance related outcome variables, such as commitment, exhaustion, satisfaction, and work engagement. Grounded in COR and Regulatory Focus Theory (Higgins, 1997), this study will investigate how resources are involved in shaping homogeneous subgroups of resource acquisition (i.e., job crafting styles) and will investigate how these subgroups differ in their levels of work engagement. This study contributes evidence as to how job crafting can serve as the mechanism by which resources can be invested in order to initiate "gain spirals" and how a personal resource can be involved in this process.

Study 3 "Tenets of Self-Determination Theory as a mechanism behind challenge demands: A within-person study" will investigate the mediating role resources (i.e., the satisfaction and thwarting of basic needs) can play linking challenging job demands to outcomes such as job satisfaction and irritation at the intra-individual level. Self-determination theory (SDT; Ryan & Deci, 2000) is a meta-theory of motivation and has been used for research in occupational health settings (e.g., Dreison et al., 2018). One core tenet of SDT posits that in order to be motivated and optimally function, individuals need to be able to make their own decisions, have a sense of efficacy to successfully manage their environment, and have the support and a sense of belonging with the people around them (i.e., the basic needs of autonomy, competence, and relatedness). van den Broeck et al. (2008) originally integrated the basic needs as resources into a work stress framework. In their study, satisfaction of the needs for autonomy, competence, and relatedness mediated between job demands/job resources and work outcomes such as vigor and exhaustion. The study in this dissertation builds on this literature my extending the notion of basic psychological need satisfaction to include need thwarting and investigating these effects at the intra-individual level. Furthermore, COR's basic tenet and several principles (such

as primacy of resources loss and the gain paradox principle) can be explored in this study. By investigating basic psychological needs as a mechanism through with challenge demands affect worker wellbeing outcomes, this study contributes another avenue through with resources are involved in worker wellbeing.

Together, these manuscripts will investigate several tenets, principles, and corollaries of COR as outlined in Table 1, as well as integrate aspects of Self-Determination Theory (Ryan & Deci, 2000) and Regulatory Focus Theory (Higgins, 1997) in the worker wellbeing process. Together, these studies will investigate how resources and influence elements of all four components of worker wellbeing (e.g., physical wellbeing in study 1, eudemonic wellbeing in study 2, and hedonistic and strain in study 3).

Table 1- *Aspects of COR, theoretical integration, and aspects of wellbeing by manuscript*

| | | **Paper 1** | **Paper 2** | **Paper 3** |
|---|---|---|---|---|
| **COR Basic Tenet** | Obtain, retain, foster, and protect things they centrally value | X | X | X |
| **Principle 1** | Primacy of resource loss principle | X | | X |
| **Principle 2** | Resource investment principle | X | X | X |
| **Principle 3** | Gain paradox principle | | | X |
| **Principle 4** | Desperation principle | | X | |
| **Resource caravans** | | X | | |
| **Resource caravan passageways** | | | | |
| **Corollary 1** | Initial starting point impacts likelihood of gain or loss | | X | |
| **Corollary 2** | Resource loss cycles | | | |
| **Corollary 3** | Resource gain cycles | | | |
| **Self-Determination Theory** | | | | X |
| **Regulatory Focus Theory** | | | X | |
| **Challenge-Hindrance Framework** | | (X) | (X) | (X) |
| **Worker Wellbeing** | Hedonic | X | | X |
| | Eudemonic | X | X | |
| | Negative | X | | X |
| | Physical | X | | |

*Note: (X) denotes secondary contributions that were not explicitly proposed beforehand, but the results nonetheless warrant the discussion and contribute to our understanding of the worker wellbeing process.*

*Figure 2 - Summary of Studies and Results*

**Study 1 - Directs effects of resources on mental and physical wellbeing**

**Aim**: Explorative research on how self-evaluated gain, loss, or conservation of resources after changing jobs affects mental and physical health

**Method**: N = 2296 (2539 observations)

**Design**: Fluctuation in 6 resources after job changes in panel data (SOEP, 3 waves from 2002-06)

**Measures:** Single-item measures of 6 resources (e.g., job security, advancement opportunities, salary) rating if gained, lost, or stayed the same. Mental and physical health assessed with the SF-12

**Analysis**: Multilevel Latent Class Analysis with distal outcomes (BCH Method), controlling for previous health outcome (before job change)

**Result summary**: 4 latent classes were found, 3 of which formed uniform resource caravans (gaining, maintaining, losing resources). Resource loss was associated with diminished health. One class both gained and lost resources, while improving physical health (suggesting resource investment)

**Study 2 - Effects of investing resources to affect gain spirals and eudemonic wellbeing**

**Aim**: To explore how resources can be invested to affect gain spirals through effective job crafting and what type of job crafting is most effective in affecting work engagement

**Method**: N = 104 (348 observations)

**Design**: 4-weekly self-report online diary study

**Measures:** Job Crafting, Psychological Capital, and Work Engagement

**Analysis**: Multilevel Latent Profile Analysis, with predictors of latent profile membership and a distal outcome

**Result summary**: PsyCap as associated with the latent profile that showed highest work engagement. Decreasing demands as job crafting strategy did not play a role, all found profiles can be considered approach oriented – casting doubt on approach/avoidance classifications of job crafting. Increasing job resources and increasing challenge demands was associated with highest levels of work engagement

**Study 3 - Mediating effects of need satisfaction and thwarting on hedonic wellbeing**

**Aim**: To investigate these the ambiguous effects of time challenge can be explained by their potential to both satisfy and thwart basic psychological needs (autonomy, competence, relatedness).

**Method**: N = 84 (308 observations)

**Design**: 4-weekly self-report online diary study

**Measures**: Time Pressure, Job Complexity, Basic Psychological Need Satisfaction and Thwarting, Emotional Exhaustion, and Job Satisfaction

**Analysis**: Multilevel Bayesian Structural Equation Modelling, within-level parallel mediation analysis

**Result summary**: No ambiguous effects were found. Time pressure was mediated by thwarting the need for autonomy to increased emotional exhaustion and decreased job satisfaction. Job complexity was related via need for competence satisfaction to decreased emotional exhaustion

## 2. Reprint of manuscripts

## 2.1. A typological approach of perceived resource fluctuations after job transitions in a representative panel study

### *2.1.1. Abstract*

Job and career transitions are unique experiences that vary within and between persons. One likely reason for differential effects of transitions is that they can involve resource gains, losses, conservation, or a combination thereof. This study investigates perceived resource fluctuation patterns as reasons for differential health outcomes in a representative German panel study (n=2296). Participants compared six characteristics of their new job with their previous one in three categories (better, same, or worse): (1) job security, (2) working hour regulations, (3) workload, (4) use of professional knowledge, (5) advancement opportunities and (6) earnings. We conducted multilevel latent class analyses (LCA) with mental and physical health as distal outcomes. Results showed a four-class solution with different probabilities of endorsing that job conditions have fluctuated after the transition. Results also indicated important nuances between the latent classes in terms of mental and physical health outcomes. This study adds to a growing body of knowledge concerning the key role resource fluctuations, and the interplay of various resource dynamics play in the sustenance of mental and physical health. Results also provide implications for career guidance, as well as dealing with organizational newcomers to ensure their well-being, and therefore also their performance.

Keywords: Job transitions, resource gains and losses, latent class analysis, mental health, physical health

### *2.1.2. Introduction*

Job transitions come along with changes in work-related resources. Ideally, after transitioning jobs, workers would enjoy more resources like autonomy, money, or job security, because gaining resources is central to human flourishing (Conservation of Resources Theory, COR; Hobfoll, 1989). For instance, Hu, Schaufeli, and Taris (2017) have shown that an increase in a combination of resources was significantly associated with increased engagement and decreased burnout.

However, resources may not only increase following job transitions. Compared to the previous job, a new job may provide higher salary but at the cost of higher workload. The new job may provide a better fit to ones' professional competencies but at the same time provide less job security. Job transitions can therefore be a double-edged sword, as Hobfoll (1989) postulated that "ambiguous" events could produce resource gains and losses simultaneously. Research showed that while upward career transitions do result in increased job satisfaction, this type of transition also comes with potential negative consequences, such as increased time pressure that leads to resource depletion (Rigotti et al., 2014).

This study will use job transitions as career-related events to study combinations of job resource fluctuations to explore how the gain, loss, and conservation of resources affects worker well-being. Since not all resources are equally involved in the sustenance of health outcomes (Spector et al., 1988), understanding the effects caused by dynamics of resource fluctuations on health and well-being may prove valuable in understanding COR and its tenets. Depending on the resource fluctuation pattern, some types of transitions may result in better health outcomes, while others may deteriorate health.

To investigate patterns of transitions and their differential health outcomes, we have used data from a large, representative panel study to explore and classify profiles of types of job transitions. The types of profiles were based on individuals' responses about what resources they have acquired, lost, or kept after a job transition. Such resource fluctuations are often only

assumed in research (Halbesleben et al., 2014). For example, Latzke, Kattenbach, Schneidhofer, Schramm, and Mayrhofer (2016) studied the consequences of voluntary external job change for job satisfaction and income. Dunford, Shipp, Boss, Angermeier, and Boss (2012) considered how types of job transitions (organizational newcomers, internal job changers, and job incumbents) differed in patterns of burnout dimensions over time. The authors were able to show differences in the burnout process depending on the type of transition. However, in both studies, the possible mechanism of resource fluctuation due to the transitions was not explicitly considered.

There are examples of studies factoring in resource fluctuations: Rigotti et al. (2014) were able to show that even upward career changes can have detrimental effects through the loss of some resources. Debus, Fritz, and Philips (2018) investigated how transitions into a managerial role effected resource gains in terms of participation in decision-making. A study by Verbruggen, de Cooman, and Vansteenkiste (2015) is one of a few studies that employed a direct assessment of subjective evaluations of changing job conditions after an internal job transition.

As we have outlined above, many variable focused studies were not able to test the possible interplay of combinations of resources. If job transitions really are a "double-edged sword" and combinations of resources can be gained and lost together, this study may offer a unique opportunity to take a person-centric look at the intricate interplay of the resource dynamics in the well-being process that Conservation of Resources Theory (COR; Hobfoll, 1989) proposes. Secondly, we will investigate how these combinations of gains and losses could affect mental and physical health. This gives us a chance to test tenets such as the Primacy of Resource Loss Principle of COR (Hobfoll, 1989) which stipulates that the loss of resources weighs heavier on well-being than gaining resources. This may not only contribute a possible mechanism (differences in resource fluctuation patterns between transition types) to the literature, but also offer insights into further principles and corollaries that COR hypothesizes. In the following

sections, we will first provide rationales for the choice of resource fluctuations as indicators for prototypical patterns and highlight the theoretical background based on COR.

#### *2.1.2.1. Fluctuation of resources after job transitions and COR Theory*

While the workplace of the 21st century consists of evermore-complex job characteristics, workers simultaneously have to cope with varying levels of resources (Wegman et al., 2016). If the environment changes, as it does after a job transition, the individual will have to adapt and match their resource allocation to the context. A review by Feldman and Ng (2007) has shown how different types of job mobility (i.e., occupational mobility, organizational mobility, and job mobility) can lead to different outcomes. Regarding health outcomes specifically, the above-mentioned study by Dunford et al. (2012) has shown evidence for the impact of career transitions and burnout trajectories. Additionally, Kramer and Chung (2015) have shown that changes in work demands (e.g., after a promotion) can both increase and decrease rates of Body-Mass-Index (BMI) gain. In that study, an increase in working hours was associated with an increased rate of BMI gain, while an increase in work responsibility was associated with a decreased rate of BMI gain. In addition, in a study of scientific journal editors, the authors found that research productivity was impacted by taking/leaving journal editorial positions (Aguinis et al., 2017).

Adler and Castro (2019) propose that stress theories such as COR provide a meaningful framework with which to understand peoples' responses to job transitions. Hobfoll (1989) defined resources as "those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies" (p. 516). In the COR framework, psychological stress is, therefore, the result of impending, anticipated, perceived, or actual loss of net resources. For example, in the COR framework, an increase in workload constitutes a condition that is a resource drain, because the strain from increased workload may threaten the acquisition of new resources. COR postulates that when people are confronted with stressors, they will strive to

minimize the net loss of resources. Beyond the idea that conservation and gaining of resources are the main factors for thriving, COR also proposes principles and corollaries that influence this process in more detail. For one, COR asserts that resources tend to be lost or acquired together in so-called resource caravans. Secondly, the primacy of resource loss principle of COR states that the loss of resources will have stronger negative effects than the gain of resources will have positive effects. Since its conception as a general stress model, COR has evolved and has been applied in organizational contexts (Hobfoll & Shirom, 2000). Holmgreen, Tirone, Gerhart, and Hobfoll (2017) noted the application of COR in occupational burnout research. In unemployment research, loss of resources was associated with increased depression, anxiety, and physical symptoms (Kessler et al., 1988). More recently, COR has been used as a framework by which to review the career success literature (Spurk et al., 2019). The authors suggest the importance of studying job transitions as potential stressors or "shocks" and COR should play a vital role in career transitions research. By looking at the combination of mixed sets of resource gains, losses, or conservation, we aim to provide a more holistic investigation of the interplay of resources, such as building resource caravans.

#### *2.1.2.2. Resources and their relationship to health outcomes*

As Hobfoll (1989) theorized, stress is the response to the hazard of resource loss and classified resources into four categories: conditions, objects, energies, and personal characteristics. Conditions are "resources to the extent that they are sought after. Marriage, tenure, and seniority are examples of these" (p. 517). Object resources are valued for some physical aspect they possess, such as a car or a building. Energies, which include time, knowledge, and money, are a valuable resource category because of their value in acquiring other resources. Finally, personality attributes are an example of personal characteristics. This classification can be helpful for understanding the nature of the resource being studied. Our study will examine the interplay of gaining, losing, or conserving three condition resources (job security, type of work schedule, workload) and three energies (use of professional knowledge, professional

advancement opportunities, income). Next, we will introduce the resources included in our analysis in further detail.

Job (in)security has emerged as an important work stressor (Dewe & Cooper, 2017) and has been linked to lower employee well-being (Sparks et al., 2001), as well as anxiety, depression, and psychosomatic complaints (Garst et al., 2000; Mohr, 2000). Job insecurity is also an important factor for transitions, as it is related to employee exit (Sverke & Goslinga, 2003) and turnover intentions (Stiglbauer et al., 2012). However, job insecurity is not only a vital factor in proactive transitions, but it has also been identified as a key aspect in involuntary transitions (Hom et al., 2012). Having a secure job protects from actual and perceived resource loss and is therefore a desirable condition resource.

Research into types of work schedules in a large European survey showed that individual discretion and autonomy in choosing a flexible work schedule were related to positive well-being outcomes while being submitted to company-controlled variable scheduling had adverse effects for the employees' health (Costa et al., 2006). After conducting a systematic review on the topic of scheduling flexibility and health outcomes, Joyce, Pabayo, Critchley, and Bambra (2010) echoed this sentiment. Having a predictable and flexible work schedule is a condition that also protects from potential resource loss.

In a meta-analysis, workload has been shown to relate to health outcomes (Nixon et al., 2011). Specifically, workload has been linked to physical health complaints (Carayon, 1993), distress (Glickman et al., 1991), effort, fatigue, spillover of negative effects into private life (Rydstedt et al., 1998), as well as anxiety and frustration (Spector et al., 2000). In addition to its stressing character, workload is discussed to be a challenge stressor that can lead to motivational gains, and provide an opportunity to learn and grow (cf., Cavanaugh et al., 2000). As Bakker and Demerouti (2007) define resources in part as aspects of work that are functional in achieving work goals and "stimulate personal growth, learning, and development" (p.312), we consider

an adequate workload an important condition resource because a condition with too much workload constitutes a resource drain.

Regarding the energies resources, we would like to first examine the ‘use of professional knowledge’. This resource has been operationalized in different ways in the literature. For example, Leiter (1990) researched what the author termed skill utilization and found a negative relationship to facets of burnout. Feldman (1996) included underutilization of skills as one of five dimensions of underemployment and proposed a research agenda including the investigation of how underemployment relates to mental health outcomes. McKee-Ryan and Harvey (2011) revisit Feldman’s conceptualization of underemployment and review the literature regarding its measurement and outcomes. Their review shows that there is support for underemployment has a negative influence on mental well-being. However, underutilization of skills as a sub-facet of underemployment was not considered in that review. Furthermore, underutilization of skills is often only inferred by being operationalized as over-education, as for example in Friedland and Price’s (2003) study of underemployment’s effects on well-being. Regardless how the use of professional knowledge is operationalized (e.g., as skill utilization, underemployment, or over-education), the literature reveals it to be an important resource relevant in the maintenance of health and ability to work. While the knowledge and skills a worker possesses fit the description of a personal characteristic, workers can rely on their knowledge and skills to focus on gaining other resources. It may therefore also be an energy resource.

Next, we considered professional advancement opportunities among resources related to employees' well-being and mental health. Ng and Feldman (2014) found meta-analytic evidence that a lack of promotion opportunities was negatively related to subjective career success. However, the perceived opportunities to advance professionally have received little attention in occupational health psychology research regarding mental and physical health outcomes. In suburban teachers, a lack of advancement opportunities was associated with stress

(Farber, 1984). Souza-Poza and Souza-Poza (2000) considered perceived advancement opportunities in their cross-national study in relation to job satisfaction. Both studies suggest advancement opportunities as a potential resource, but how advancement opportunities relate specifically to psychological and physiological outcomes remains largely unknown. Advancement opportunities, if realized, can lead to the acquisition of more resources (e.g., a higher salary and/or more job security). We therefore consider it an energy resource, although being in a job with advancement opportunities could also fit the condition definition depending on the conceptualization.

Lastly, due to its fungibility (i.e., the ease of exchanging it for other resources), the efficacy of salary as an energy resource is self-evident. Adelman (1987) studied the effects of employment status and income on well-being and self-confidence, whereas Diener (2000) discussed the association between income and subjective well-being. Sinclair and Cheung (2016) called money a significant cause of stress for present-day workforces. The authors lament that while money has been a focus of research in other disciplines, economic concerns seem to not be as well researched in Occupation Health Psychology.

Following Hobfoll's (2014) notion of resource caravans, the six above-mentioned resources (1) could be acquired and lost in aggregate (all six resources together) or (2) fragmentarily according to resource classification (caravans by condition classification and energies classification) or (3) individually (building no caravans at all). Utilizing a typological approach by means of a latent class analysis to capture and classify such fluctuations in resources allows us to capture such potential interplay of the resources. Our first research question is thus:

> RQ1: Will resource fluctuations form resource caravans, and if yes, will those caravans form along Hobfoll's categorization of resources?

#### *2.1.2.3. Mental and physical health outcomes*

Gustavsson et al. (2011) estimate that mental disorders incurred 798 Billion Euro in direct and indirect costs in the EU in 2010. Taken together, mental, and physical disorders constitute an

enormous burden on societies around the globe. However, many studies in a career context have only looked at work-related attitudes as outcomes (e.g., Yang et al., 2018). Prior research into the effects of various kinds of job transitions has found a link between job changes and mental health. For example, losing a job has been linked to diminished mental health (Gebel & Voßemer, 2014; Paul & Moser, 2009). Similarly, Ferrie et al. (1995) showed that mere anticipation of job loss can negatively influence self-reported health and Wright and Bonett (1992) showed that the type of turnover could have implications for worker mental health. Berntson and Marklung (2007) showed that employability, i.e., an employee's belief of being able to find a new job if necessary was positively related to general health and mental well-being. In a UK panel study. Chandola and Zhang (2018) investigated how transitioning from unemployment into poor quality or high quality jobs influences allostatic load biomarkers. Their results showed that transitioning into a poor-quality job led to higher allostatic load than remaining unemployed. However, these studies do not specifically consider the gains and losses of resources during job transition, and stipulate a particular type of transition (e.g., job loss, staying vs moving, changing jobs vs changing occupations, re-employment after a period of unemployment). Building upon COR, this study aims to investigate how resource fluctuations associated with job transitions will influence mental and physical health outcomes. For example, COR's Primacy of Resource Loss Principle should lead to differential effects depending on acquisition patterns. Therefore, the conservation and acquisition of resources should be related to different health outcomes.

RQ2: Are there differences between the identified latent classes regarding different health outcomes (mental and physical)?

### *2.1.3. Method*

#### *2.1.3.1. Data source*

The German Socio-Economic Panel Study (SOEP) is a representative survey of households in Germany conducted by the German Institute for Economic Research (DIW) since 1984

(Wagner et al., 2007). On a yearly basis, the SOEP surveys approximately 12,000 households to collect representative micro-data on persons and families. For a few waves, the SOEP contained an *Occupational Mobility Topic* which asked participants "How would you assess your current job compared to your former position? In which aspects are you better off now, which aspects have remained about the same, and in what aspects are you worse off now?". Respondents indicated whether the use of professional knowledge, security against job loss, the work schedule, workload, advancement opportunities and wages have improved, stayed the same, or worsened after a job transition. Changes to the job itself, such as *job crafting*, were not part of our definition of job transition. This comparison of current job characteristics to the previous job is a valuable concept that is unique to the SOEP. It allowed us to capture participants' evaluations about the fluctuations in their resources.

#### *2.1.3.2. Sampling and descriptives*

The participants' evaluation of fluctuations in resources after a job transition was assessed every other year in three waves from 2002 to 2006. We used SPSS to select all instances in which a job change and valid measures of mental and physical health (SF-12; Ware et al., 1996) were indicated to create a dataset of only job changers from the SOEP-Data. As our focus lies on resource fluctuation, we included any transition into a new job, position, employer, or occupation in our analyses, no matter if it was internal or external. Overall, the sample consisted of 2296 people contributing 2513 observations/transition events to the analysis. Table 2 depicts the descriptive statistics in each wave of the study. To check the representability of our sample, we cross-referenced the proportions of the economic sector codes of our sample with data from the Federal Statistical Office of Germany (Statistisches Bundesamt, 2020). The proportions were largely congruent. We have conducted a Little's Test and established that the missing items on the resources measure are not dependent upon gender, education, and marital status (i.e., MCAR; Chi2=80.06, df=83, p=.57) and can therefore be considered ignorable missing (cf., Graham, 2009).

Table 2 – *Descriptive statistics by time point*

| | | T1 | | | | T2 | | | | T3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | Percent | *M* | *SD* | N | Percent | *M* | *SD* | N | Percent | *M* | *SD* |
| Age | | 1001 | -- | 37.88 | 11.28 | 702 | -- | 37.88 | 11.23 | 810 | -- | 38.77 | 11.67 |
| Years of work | | 955 | -- | 11.35 | 10.38 | 701 | -- | 11.74 | 10.58 | 762 | -- | 11.40 | 10.31 |
| Hours of work/week | | 959 | -- | 36.30 | 14.87 | 690 | -- | 35.20 | 14.94 | 777 | -- | 35.24 | 15.24 |
| Sex | Male | 500 | 50.00 | -- | -- | 337 | 48.00 | -- | -- | 405 | 50.00 | -- | -- |
| | Female | 501 | 50.00 | -- | -- | 365 | 52.00 | -- | -- | 405 | 50.00 | -- | -- |
| Education | In school | 31 | 3.10 | -- | -- | 16 | 2.30 | -- | -- | 19 | 2.30 | -- | -- |
| | General elementary | 109 | 10.90 | -- | -- | 77 | 11.00 | -- | -- | 81 | 10.00 | -- | -- |
| | Middle vocational | 456 | 45.60 | -- | -- | 318 | 45.30 | -- | -- | 376 | 46.40 | -- | -- |
| | Vocational + Abitur | 92 | 9.20 | -- | -- | 65 | 9.30 | -- | -- | 75 | 9.30 | -- | -- |
| | Higher vocational | 68 | 6.80 | -- | -- | 50 | 7.10 | -- | -- | 46 | 5.70 | -- | -- |
| | Higher education | 234 | 23.40 | -- | -- | 168 | 23.90 | -- | -- | 192 | 23.70 | -- | -- |

#### *2.1.3.3. Measures*

*Resources.* The *comparison of current job characteristics to previous job concept* of SOEP includes nine items. Based on the above-mentioned resource classification, we identified six job characteristics that related to job-transition-health-outcomes: (1) job security, (2) type of work schedule, (3) workload, (4) use of professional knowledge, (5) advancement opportunities, and (6) income. Other potential resources, like the length of the commute, were omitted for lacking direct relation to the job. Participants responded to each item on a 3-point scale with the response alternatives: (1) improved, (2) about the same, and (3) worsened.

*Mental and Physical Health.* The SOEP contains the SF-12 assessment created by Ware et al. (1996) to assess mental and physical health dimensions. SOEP computes a summary score for each component: the mental component summary score (example item: “How much time during the past 4 weeks have you felt calm and peaceful?”), and physical component summary score (example item: “During the past 4 weeks, how much did pain interfere with your normal work, including work outside the home and housework?”). According to the “Norm-Based-Scoring “(NBS) approach, raw data was first transformed to values ranging from 0 to 100, then z-standardized, and again linear transformed with a mean at 50 and a standard deviation of 10.

Lower scores indicate worse health. In the SOEP, a score of 50 represents the average of the SOEP sample. Although designed for medical and population health research, the SF-12 has been used to study health outcomes in occupational settings. For instance, Pepper, Messinger, Weinberg, and Campbell (2003) used the SF-12 to study the effects of job insecurity and downsizing.

#### *2.1.3.4. Analytical strategy*

*Measurement Model—Latent Class Analysis (LCA).* We conducted an LCA within a multilevel framework (transition events are nested within persons), which belongs to the family of finite mixture models (FMM). These are a type of latent variable models in which "[…] one assumes that the overall population heterogeneity with respect to a set of manifest variables results from the existence of two or more distinct homogeneous subgroups, or latent classes, of individuals" (Masyn, 2013, p. 551). LCA is like Latent Profile Analysis (LPA) with the difference that the indicator variables are categorical, whereas indicators are continually scored in LPA. LCA has found broad application in psychological research (e.g., types of resilience after child-loss; Wang et al., 2016, patterns of bullying in organizations; Einarsen et al., 2009, and types of psychological contracts; de Cuyper et al., 2008). As far the authors are aware, this study is the first application of LCA to identify patterns of resource fluctuations due to job transitions. Finding the appropriate number of classes to best explain the differences in observed response patterns is the first step in ordinary LCA. To establish model fit, several unconditional models were estimated in Mplus Version 7.3, ranging from two up to eight classes.

*LCA with Distal Outcomes.* Next, we used the manual 3-step BCH multilevel method of estimating LCA with distal outcomes (Block et al., 2004), with transitions nested within persons. The BCH method first estimates the latent class measurement model, saving BCH weights, and then uses those BCH weights to estimate a model that is conditional on the latent classes, estimating class-specific means of the outcomes (mental and physical health). We accounted for the nested data structure of transition events being nested in persons by using the

"type = complex mixture" function in Mplus. Since reporting on more than one job transition within the six years' period was a rare event (2 transitions occurred 394 times, 3 transitions occurred only 30 times) even within this large, representative data, applying Latent Transition Analysis was not an option. To capture changes over time, we included the auto regressor of our outcome variables in our models (i.e., we controlled for mental health, and physical health, respectively in the wave before the transition event; stability coefficients are provided in Table 6).

The 3-step BCH method is implemented in Mplus, which the authors recommend when estimating LCA with distal outcomes because this method avoids latent class shifts (Asparouhov & Muthén, 2014b). Bakk and Vermunt (2016) also tested the robustness of stepwise latent class models when estimating continuous distal outcomes. They reported the BCH method produced the least biased estimates and recommend using the method as well.

*Reasons for the Transition.* Why someone transitioned may play a key role. Unfortunately, there was only limited information about the reasons for a job transition. Data was available only for 1007 respondents, reporting on 1065 transition events. Respondents could answer to a choice of seven categories. We grouped these into three broad categories: voluntary transitions (including "own resignation", and "mutual termination"), involuntary transitions (including "terminated by employer", and "company closed down") and others (including "ended self-employment", and "temporary contract expired or training completed"). The share of involuntary transitions was 26.7%, voluntary transitions made 52.6% and others accounted for 20.7%. As this information was only available in a subsample, and we were interested in the effects of resource fluctuations, we decided not to include the reason for a transition in our main analyses. However, we conducted additional analyses on this subsample to provide information about the impact of the reason of transition on latent class membership.

### *2.1.4. Results*

To address the research questions, we conducted LCA with mental and physical health as outcomes, using a 3-step BCH weighted design. Table 3 depicts the correlations and Table 4 contains fit statistics for the estimated unconditional models.

Table 3 - *Standardized correlations*

| | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | Job Security | -- | | | | | | |
| 2 | Type of Work Schedule | .18** | -- | | | | | |
| 3 | Workload | .15** | .40** | -- | | | | |
| 4 | Use of Prof. Knowledge | .19** | .06** | .02 | -- | | | |
| 5 | Adv. Opportunities | .34** | .08** | .06* | .41** | -- | | |
| 6 | Income | .28** | .04 | -.02 | .32** | .46** | -- | |
| 7 | Mental Health Score | -.07** | -.08** | -.10** | -.01 | -.08** | -.04* | -- |
| 8 | Physical Health Score | -.08** | -.02 | .00 | -.06** | -.10** | -.12** | -.06** |

Note: *Correlations were computed using the Type = Complex function in Mplus; * p < .05; ** p < .01*

Table 4 - *LCA enumeration in unconditional models allowing for residual covariance*

| Latent Classes | Class Count | Proportion | Entropy | AIC | BIC | Sample-Size Adj. BIC | LMR Adj. LRT |
|---|---|---|---|---|---|---|---|
| 1 | 985 | .39 | .77 | 29622.97 | 29803.67 | 29705.18 | 525.92 |
| 2 | 1528 | .61 | | | | | p < .01 |
| 1 | 1781 | .71 | .76 | 29564.41 | 29785.92 | 29665.19 | 71.29 |
| 2 | 145 | .06 | | | | | p < .01 |
| 3 | 587 | .23 | | | | | |
| 1 | **1016** | **.40** | **.94** | **28241.5** | **28503.81** | **28360.84** | **593.45** |
| 2 | **366** | **.15** | | | | | **p < .01** |
| 3 | **505** | **.20** | | | | | |
| 4 | **626** | **.25** | | | | | |
| 1 | 626 | .25 | .94 | 26683.06 | 26986.18 | 26820.97 | 597.21 |
| 2 | 81 | .03 | | | | | p < .01 |
| 3 | 1016 | .40 | | | | | |
| 4 | 367 | .15 | | | | | |
| 5 | 423 | .16 | | | | | |
| 1 | 108 | .04 | .94 | 28061.51 | 28405.44 | 28217.98 | -374.76 |
| 2 | 656 | .26 | | | | | p = .94 |
| 3 | 929 | .40 | | | | | |
| 4 | 519 | .21 | | | | | |
| 5 | 99 | .04 | | | | | |
| 6 | 202 | .08 | | | | | |
| 1 | 248 | .10 | .58 | 27866.90 | 28461.48 | 28137.40 | 19.63 |
| 2 | 226 | .09 | | | | | p = .25 |
| 3 | 579 | .23 | | | | | |
| 4 | 343 | .14 | | | | | |
| 5 | 270 | .11 | | | | | |
| 6 | 329 | .13 | | | | | |
| 7 | 518 | .21 | | | | | |

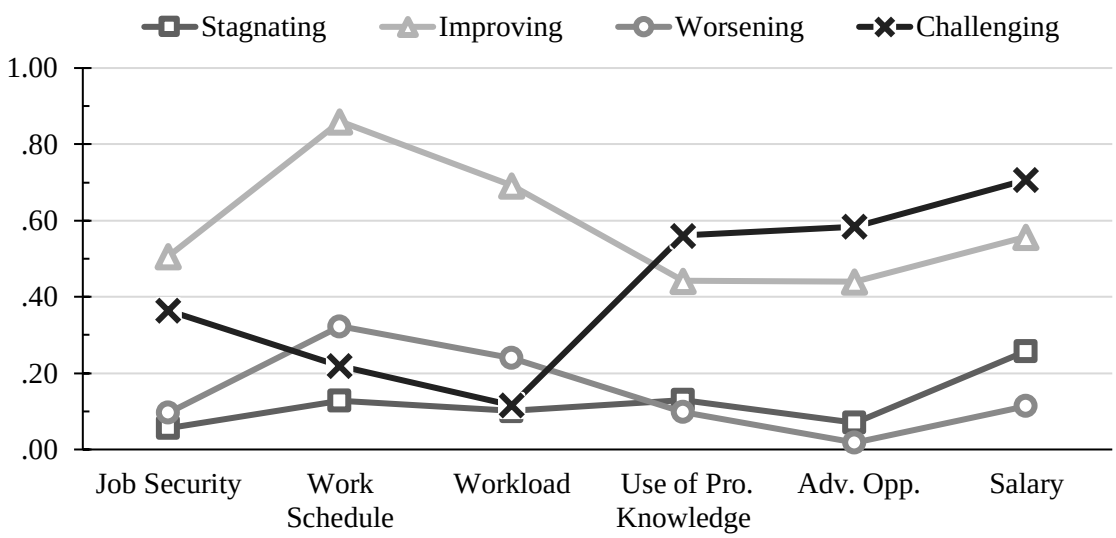
Übersax (1994) suggested that model selection should not solely rely on statistical measures, but that practical issues of interpretability, parsimony, and meaningfulness of a model often play an important role. The four-class model showed (1) high entropy, low AIC and BIC, and (2) distinct and well-defined profiles of classes. We therefore chose the 4-class model and continued to estimate the conditional models with mental and physical health as outcomes.

Table 4 shows the item-response probabilities of resource improvement, staying the same, and worsening of each latent class by indicator variables. Figure 1 depicts a graphical representation of item-response probabilities for improvement for interpretability. On the x-axis are the six resources, while the y-axis represents the item-response probabilities that a resource has improved after the transition. The latent class we labeled *stagnating* showed remarkably low item-response probabilities that any resource had improved or worsened after the transition. In fact, this latent class consistently had the highest item-response probabilities that things have stayed the same (.58-.88). In contrast, the *improving* latent class showed distinctly high item-response probabilities for improvements in all indicator variables (ranging from .44 to .86). The item-response probabilities for worsening in resources were also remarkably low for this class (.00-.21). Only on the resource advancement opportunities did the *improving* latent class show a slightly higher item-response probability for stayed the same (.51) compared to improved (.44). The *challenging* latent class showed a distinctly high item-response probability for worsening of workload but had the highest item-response probability for improved advancement opportunities, income, and use of professional knowledge after the transition. Job security and type of working schedule had the highest item-response probabilities of staying the same in this class. Lastly, the *worsening* latent class showed the highest item-response probabilities for all resources having worsened. With reference to RQ1, we can conclude that resources tended to form caravans, with three latent classes forming caravans along all six resources either improving, staying the same, or worsening - and one latent class forming caravans according to resource classification type.

Table 5 - *LCA Item-response probabilities, controlled for previous mental and physical health*

| Latent Class | Proportion | Job Security | Type Work Schedule | Workload | Use of Pro. Knowledge | Advancement Opportunities | Income |
|---|---|---|---|---|---|---|---|
| Stagnating | .32 | | | | | | |
| Improved | | .06 | .13 | .10 | .13 | .07 | .26 |
| Same | | **.86** | **.80** | **.80** | **.79** | **.88** | **.58** |
| Worsened | | .09 | .07 | .10 | .08 | .05 | .16 |
| Improving | .19 | | | | | | |
| Improved | | **.50** | **.86** | **.69** | **.44** | .44 | **.56** |
| Same | | .42 | .14 | .31 | .39 | **.51** | .23 |
| Worsened | | .07 | .00 | .00 | .17 | .05 | .21 |
| Challenging | .26 | | | | | | |
| Improved | | .36 | .22 | .12 | **.56** | **.58** | **.71** |
| Same | | **.53** | **.42** | .38 | .33 | .40 | .20 |
| Worsened | | .11 | .36 | **.51** | .11 | .02 | .09 |
| Worsening | .23 | | | | | | |
| Improved | | .10 | .32 | .24 | .10 | .02 | .11 |
| Same | | .40 | .32 | .35 | .35 | .25 | .18 |
| Worsened | | **.50** | **.35** | **.41** | **.55** | **.73** | **.71** |

Figure 3 - *Series plot of item-response probabilities of "improved"*




Since job transitions are unique experiences, their effects may also be experienced differently. Our first goal was to identify distinct types or classes of transitions based on job characteristics. The second goal of the analysis was to examine whether the latent classes of job changes yield different health outcomes. After performing the LCA with distal outcomes, controlling for previous mental and physical health, we implemented Wald-Chi² tests on the class-specific means of the dependent variables mental health and physical health. Figure 3 shows the class-specific means on the outcome variables.

Figure 4 - *Estimates of means of mental health and physical health scores of the four latent classes controlled for previous mental and physical health*

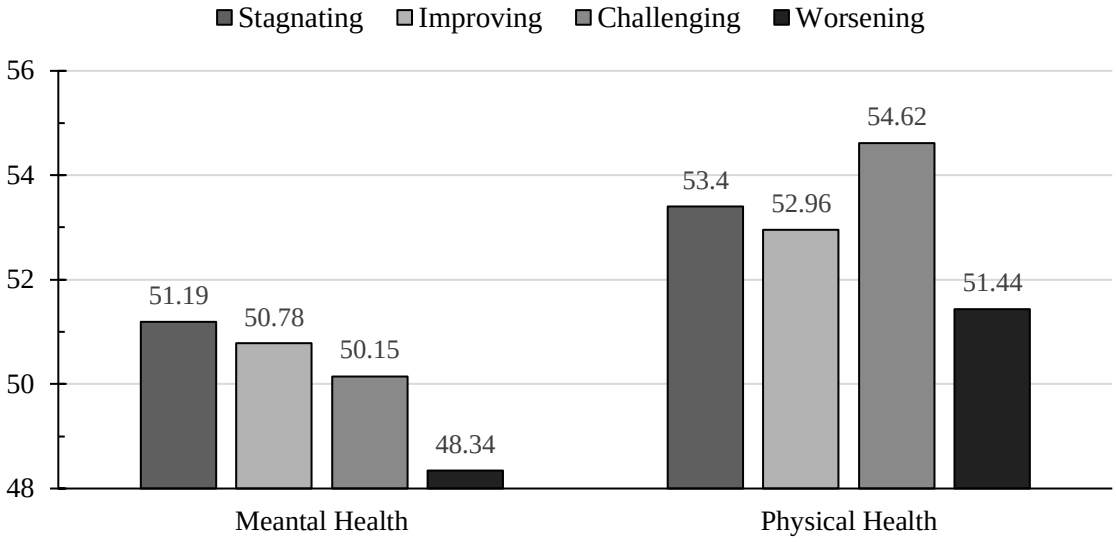



Table 6 - *Wald-chi² tests of significant differences on distal outcomes, controlled for previous mental and physical health*

| Latent Class | $M^{mental}$ | $r_{st}^{mental}$ | $M^{physical}$ | $r_{st}^{physical}$ | p-values for Wald Chi² Tests | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Stagnating | Improving | Challenging | Worsening |
| Stagnating | 51.19 | .33 | 53.40 | .66** | -- | .57 | .15 | .00** |
| Improving | 50.78 | .43** | 52.96 | .77** | .56 | -- | .41 | .00** |
| Challenging | 50.15 | .44** | 54.62 | .58** | .03* | .00** | -- | .01* |
| Worsening | 48.34 | .68** | 51.44 | -.88** | .00** | .01* | .00** | -- |

Note. *Upper diagonal represents the estimates for mental health, whereas the lower diagonal represents estimates for physical health, * p < .05, ** p < .001;* $M^{mental}$ *= estimated means of mental health,* $M^{physical}$ *= estimated means of physical health,* $r_{st}^{mental}$ *= stability coefficient of mental health,* $r_{st}^{physical}$ *= stability coefficient of physical health*

The results of the Wald-Chi² test in Table 5 indicate that at least some of the latent classes show different health scores on the class-specific estimated distal outcomes ($p \leq .05$). On mental health, the stagnating class showed the highest mental health scores, followed by the improving and challenging latent classes. However, none of these scores were significantly different from each other. The worsening latent class had significantly lower mental health scores than all other latent classes. On physical health, the challenging latent class had significantly better estimated class-specific outcome scores than all other latent classes. Worsening had significantly worse physical health scores compared to all other classes. The stagnating and improving latent classes did not significantly differ from each other. Based on these analyses

we conclude (RQ2) that there are differences between the identified latent classes regarding different health outcomes (mental and physical).

#### *2.1.4.1. Additional analyses*

The aim of our study was to look at combinations of changes in resources, with job transitions as triggers. Of course, the type of job transition, and specifically to what extent it can be considered voluntary or involuntary might have an impact on the resource fluctuation pattern. To test for the unique effect of our resource fluctuation in combination with volition of the transition, we conducted additional analyses. As described above, data for the reason of a transition was available for only 40% of the sample used for the main analyses. We checked whether the type of transition was related to latent class membership. Table 6 shows the results of a multinomial regression using the worsening latent class as the reference class, and voluntary transitions as the reference category. Respondents that experienced an involuntary job transition showed to have a lower probability to be in the stagnating, improving, and challenging classes when compared to respondents with voluntary transitions (latent class membership was defined by means of a latent class analyses applied to the full sample).

Table 7 - *Multinomial regression, predicting class membership by type of transition*

| | **Stagnating** | | **Improving** | | **Challenging** | |
|---|---|---|---|---|---|---|
| | **γ (SE)** | **OR [$CI_{95\%}$]** | **γ (SE)** | **OR [$CI_{95\%}$]** | **γ (SE)** | **OR [$CI_{95\%}$]** |
| Involuntary | -.43* (.21) | .65 [.43;.99] | -1.43** (.23) | .24 [.15;.38] | -1.14** (.23) | .32 [.20; .50] |
| Other | -.29 (.25) | .75 [.46;1.21] | -.89** (.25) | .41 [.25; .67] | -.52* (.25) | .60 [.37; .97] |

Note. * *p* < .05, ** *p* < .001; γ = unstandardized estimate, CI95% = 95% Confidence Interval, OR = Odds Ratio, SE = Standard Error. N = 1065 transitions, nested in k = 1006 persons.

### *2.1.5. Discussion*

This study used the participants' own evaluations of resource gains, losses, and stagnation after a job transition to investigate patterns of resource drift. The results of our analyses showed (1) that there were resource caravans as bundle of resources were either jointly gained, lost, or conserved (RQ1), and that (2) different latent classes of job transitions had different health outcomes (RQ2). A variable-centric approach that does not consider latent classes of resource profiles might have failed to account for some of the variance attributed to being in a specific latent class in explaining health outcomes.

Our study included condition category and energy category resources. Three out of four latent classes formed because of uniform gain, loss, or conservation across all resources, i.e., the transitions in these latent classes could be considered unambiguous events. For example, the *stagnating* latent class had high item-response probabilities for staying the same across all resources, while the *improving* latent class showed a uniform improvement across all resources. This may lend further credibility to Hobfoll's (2014) notion of *resources caravans* as contextual factors may facilitate the resource acquisition and loss across all resources, as opposed to gaining or losing individual resources here and there.

However, not all latent classes showed a uniform *resource caravan;* because the latent class we named *challenging* showed that energy resources seemed to improve, while condition resources tended to remain the same or worsened. This looks remarkably like a traditional upward career move as use of professional knowledge, advancement opportunities, and income increase at the expense of workload. This may point to our proposition that one needs to consider the complex interplay of resources. Since energies can be used to be invested to gain additional resources, one could describe the challenging latent class as investing an energies resource caravan. This may have interesting implications for the Resource Investment Principle of COR, because this latent class could be said to have invested an entire resource category caravan. However, it is important to note that the delineation of the resource categories is not so straightforward since

both use of professional knowledge and advancement opportunities could also be defined as a personal characteristic and a condition resource respectively. Nonetheless, the *challenging* latent class did have the highest weekly working hours with 38.04 hours and a worsening in workload in isolation should be associated with resource depletion and poorer outcomes. Yet in combination with other resources, such as improving income, advancement opportunities, and use of professional knowledge, the *challenging* latent class fared better than other classes regarding physical health, and not significantly worse than *improving* and *stagnating* latent classes on mental health. One would have surmised that the *improved* latent class, which has gained the most resources, would boast the highest scores on both mental and physical health.

One possible explanation may be that the *challenging* latent class is evidence for the challenge-hindrance framework (Crawford et al., 2010a). This model postulates that challenge-demands, while having a resource depleting aspect, also show motivating aspects like a resource. Perhaps the *challenging* latent class can also be understood as "investing" in terms of sacrificing workload to gain other resources (namely income, advancement opportunities and use of professional knowledge). It may be possible that such challenge stressors can be seen as a resource investment.

Our study may also provide evidence for the p*rimacy of resource loss* principle proposed by Wells, Hobfoll, and Larvin (1999). For instance, the *improving* latent class showed middling in their health outcomes. Given the constantly higher item-response probabilities for improvements in all resources and the exceptionally low probability of a worsening on all indicators, et ceteris paribus, one would have expected this latent class to have significantly better health outcomes than all other classes. In direct comparison, however, the *improving* was not statistically significantly different on mental health than the *stagnating* and *challenging* latent classes, and physical health from the *stagnating*. This could potentially be due to a ceiling effect of people already in resource abundant jobs transitioning to other good jobs. Not having much of a chance to improve, they might end up in the *stagnating* class and overinflate their

health outcomes. Factoring in the comparatively dismal health outcomes of *worsening* could potentially be evidence for the *primacy of resource loss* principle as proposed by COR. This latent class fared worse on mental and physical health, compared to all other classes. In a meta-analysis of the effects of demands and resources on burnout, Lee and Ashforth (1996) confirmed that loss of resources has a larger effect on individuals' well-being than gains. Our results may indicate an imbalance in the importance of resources, meaning that their loss potentially outweighs their gain.

In sum, this study revealed evidence for several tenets and principles of COR. It has been shown that while resources do tend to caravan across all recourses, a person-centric approach revealed that this may not be the case for all latent classes of job transitions. Specifically, the challenging latent class showed qualitative differences in resource acquisition and may point towards COR notion of resource investment and "ambiguous events". The results regarding mental and physical health may also point towards the *Primacy of Resource Loss Principle*.

#### *2.1.5.1. Limitations*

Because we worked with the SOEP, the constellation of resources included in the measurement model was not purely theoretically driven or exhaustive of all possible resources. For example, resources like workplace social support (de Jonge & Schaufeli, 1998) are simply missing from the SOEP occupational mobility topic. Including further theoretically and empirically derived resources may provide a more complete picture of the resource landscape. However, including a different number of resources may affect the latent class solution as well. Similar constraints were placed on the choice of outcomes. More work-specific outcome measures of well-being such as burnout and employee engagement may have been desirable but present an interesting challenge for future research.

Generally, we caution against making causal claims based on our study design. The nature of researching resource fluctuations after job transitions in a representative sample does not permit randomly assigning experimental conditions. Given those restraints, however, the multilevel

structure of the model (transitions nested within persons) and our analyses controlling for previous health leave us confident that the differential health outcomes are in fact due to the resource fluctuations as represented by the latent classes.

Ideally, levels of resources should have been assessed before the transition and after. Unfortunately, we only have participant evaluations post-transition. Hence, we know little about the "starting value" of the resources. It is possible that people who already enjoyed an elevated level of resources hit a ceiling and could no longer improve. However, since our analysis focused on intra-individual changes, having controlled for previous health also lessens the effects of potential ceilings and bottoms.

Another limitation is the varying time points of transitions within the previous survey year. Preferably, all participants' mental and physical health would have been assessed at the same amount of time after the transition. Unfortunately, because participants were surveyed at the beginning of the year, their transition during the previous year could have occurred anywhere from one to sixteen months prior. As Sonnentag and Frese (2003) note, psychological problems tend to develop faster than physical problems. If a participant had experienced a transition the previous autumn, it is possible that physical complaints would not show up until after the survey. Nonetheless, given the large sample, we surmise a large enough portion of the transitions happened early enough during the previous year for effects to show. However, especially the *challenging* latent class showed remarkably high physical health scores compared to the other latent classes. This may be due to confounding and moderating variables such as age. A review by Wiley et al. (2017) on the effects of psychosocial resources on allostatic load concluded that effect sizes tended to be rather small and were often influenced by moderating and confounding variables in the literature they reviewed. Investigating the boundary conditions under which resources effect allostatic load and psychical health in turn, presents an interesting challenge for future research.

While most other studies investigated a specific type of transition (internal/external, voluntary/involuntary, promotions), we took a purely resource fluctuation-centric approach. We found that for most latent classes of transitions, the type of resource did not matter as much as the gain, conservation, or loss of resources. One notable exception being workload in latent class that resembled something like an upwards career transition. However, we do not know much about the reasons why people experienced the type of transition that they did. Some additional analyses that were not included in this paper showed that people with more formal education had a higher likelihood of belonging to the *challenging* latent class. Additionally, whether transitions occurred voluntarily could be an important predictor of latent class membership as well. As stated in the Descriptives Section, we only had few data on reasons for the job change (18% of the sample). These reasons included "Company Closed Down" or "Own Resignation". These are clear examples where one can assume that these reasons were voluntary or not. We therefore conducted additional analysis by dummy coding the stated reasons into "voluntary", "involuntary", or "undecipherable" in cases where it would be too much of a leap to assume (for example "Leave of Absence"). These additional analyses showed that involuntary transitions were associated with a latent class that was characterized by resource losses. This is not particularly surprising, since involuntary job transitions consisted of companies terminating the employment and companies closing down. These situations can hardly lead to an increase in resources, but it may point towards resource fluctuations as a mechanism behind involuntary transitions and ill health. Future studies could investigate the mediating role of resource fluctuations between reasons for job transitions and health outcomes. Further, considering other latent class predictors may provide more insights into the specific make-up of the latent classes. For example, individual characteristics, and personal resources such as *Career Adaptability*, *Protean Career Orientation*, or *Psychological Capital* may prove to be important predictors of resource fluctuation latent class membership as well. In the future, it may be valuable to investigate antecedents of latent class membership.

Finally, a purely fit statistics driven enumeration process potentially suggested a small fifth latent class (3% of transitions). However, this class did not lead to improvements in explaining differences in mental and physical health outcomes. Nor did it provide a new kind of resource caravan that was not included in the four-class model. We therefore chose the more parsimonious four-class model.

#### *2.1.5.2. Theoretical contributions*

We believe our study contributes to the career as well as stress literature in several ways. First, we highlighted the importance of nuanced relationships/interplay between resources: not all resources seem to have the same effects and it is important to consider complex constellations of resources. Hobfoll (1989) proposed so called "ambiguous" events, in which resource gains and losses can coincide simultaneously. We have found that three of the four latent classes were unambiguous, where latent classes were defined by forming *resources caravans* across all resources. However, one latent class, which mirrored the trademarks of traditional upward career moves (like promotions into a managerial role), showed "ambiguous" resource fluctuations in which conditions and energies resources seemed to have formed caravans. A worsening in condition resources (workload in this case) seemed to have been compensated by an improvement in the energy resources (use of professional knowledge, advancement opportunities and income). As energy resources are by definition used to acquire other resources, this may mean that ambiguous events offer a chance to invest resources (buffering a worsening in the condition resource workload, if other resource caravans are available to compensate). Perhaps the *challenging* latent class can be seen as investing their condition resource, while not unduly suffering in well-being because that group gained energy resources after the job transition.

Secondly, gaining resources may not be the mirror of losing them: a loss in resources seemed to have detrimental effects on health, while an improvement in resources seemed not necessarily more beneficial than resources staying the same. This seems to support the *Primacy of Resource*

*Loss Principle* of COR. One latent class (*challenging*) could potentially be seen as *Investing Resources* to gain other resources.

#### *2.1.5.2. Practical Implications*

Our study revealed the importance of considering job changers' circumstances. Since job transitions are idiosyncratic, it may be important for managers and practitioners to consider an employee's particular profile of resources on a new job. Our analyses showed that the resource fluctuation of the transition could have differential health outcomes. Therefore, it may be helpful to consider a job changer's resource fluctuations to support his or her transition adequately in a way that is supportive of mental and physical health. As Dunford et al. (2012) showed, it is important to consider the type of transition (organizational newcomer vs. internal job change), and upward transitions may bear health risks (Rigotti et al., 2014). Our typological, person-centric approach makes it possible to regard more granular aspects of transitions. Practitioners may want to consider the type of transition down to the level of resource fluctuations to promote optimal health outcomes and organizational performance. For example, since there is a primacy of resource loss, it may be particularly important to avert resource loss after job transition or find ways to improve employees' resilience in the face of unavoidable resource losses. Furthermore, classifying the type of transition into one of the four latent classes may help customize interventions for greater return on investment. For example, offering a job changer in a *challenging* transition latent class more salary may yield less improvement than decreasing workload or improving working schedules. Conversely, providing more need for use of professional knowledge may be a comparatively inexpensive way for organizations to deliver resources for the *worsening* latent class of job changers to increase health outcomes and performance.

## 2.2. The role of Psychological Capital in weekly job crafting profiles and their relation to work engagement: A person-oriented study

### *2.2.1. Abstract*

**Purpose** - Job crafting is believed to be the process by which workers actively shape their work environment to fit their strengths and needs. This study will use a person-oriented approach to identify possible job crafting types. Additionally, based on Conservation of Resources Theory (COR) and the Job Demands-Resources (JD-R) Model, this study will investigate the role of the personal resource Psychological Capital (PsyCap) as predictor of belonging to a job crafting type and relating job crafting types to work engagement.

**Methods** – Using 348 weekly observations from 104 participants, we conducted Latent Profile Analyses (LPA) with PsyCap as predictor and work engagement as distal outcome.

**Findings** - Results indicated three job crafting profiles, which can be characterized as three distinct proactive job crafting styles. These results are contrary to what Regulatory Focus Theory would suggest and other variable-centric and person-oriented analyses have found. The personal resource PsyCap was associated with latent profiles which lead to increased work engagement the following week.

**Originality/Value** - This study may enhance the understanding of the resource investment principle of COR, as PsyCap showed to be a valuable resource in the acquisition of further resources through effective and proactive job crafting. Secondly, as the focus on avoidance of hindering demands did not have any effects, the results may have implications for the conceptualization of job crafting as consisting of approach and avoidance components.

### *2.2.2. Introduction*

To remain healthy and productive, workers need to acquire and maintain resources (Hobfoll et al., 2018). It is therefore imperative for organizations to design jobs and workplaces that provide necessary resources for workers to flourish and perform at their best. However, organizations are only one side of the coin, as workers can also proactively acquire the resources they need: A process that has become known as job crafting (Wrzesniewski & Dutton, 2001). While the literature on job crafting has grown in the last decade, many open questions remain. For one, several researchers have proposed frameworks to categorize how workers craft their jobs based on approach/avoidance styles (e.g., Lazazzara et al., 2020; Lichtenthaler & Fischbach, 2018; F. Zhang & Parker, 2018) or even more complex hierarchical systems with eight different job crafting behavior combinations (Y. Zhang et al., 2019). However, most of these conceptualizations employed a variable-oriented approach, neglecting the constellations of job crafting behaviors individuals may exhibit (Vogt et al., 2015). Laursen and Hoff (2006) describe how variable-oriented analytic models "describe association among variables" (p.379), while person-oriented analytic models can help researchers understand configurations and dynamic connections of variables operating within persons. Referring to Tims and Bakker's resource-based definition of job crafting (Tims & Bakker, 2010), Mäkikangas (2018) recently used a person-oriented approach to establish how workers may combine job crafting strategies to increase engagement. This study revealed that job crafting strategies could be classified as either approach or avoidance focused. It left unanswered what factors influenced use of a approach-focused or avoidance-focused job crafting person-oriented approach, and whether the used job crafting approach was stable or dynamic over time, as an earlier study reported on daily fluctuating job crafting behaviors (Petrou et al., 2012a).

Conservation of Resources Theory (COR, Hobfoll et al., 2018) suggests that resources can be used to acquire more resources. The present study will investigate whether a personal resource can serve as an antecedent to job crafting styles, since COR suggests that elevated levels of a

resource could facilitate the utilization of promotion focused job crafting. Furthermore, this study will relate job crafting profiles to work engagement, as previous research on the relation between job crafting and work engagement has yielded mixed results (Y. Zhang et al., 2019). The combination of an elevated level of a personal resource and approach-focused job crafting could constitute a resource gain. Recently, authors have also begun to understand job crafting as a process (e.g., Lazazzara et al., 2020). As much of the meta-analytically reviewed evidence was cross-sectional in nature (Lichtenthaler & Fischbach, 2018), it may be important to conduct more longitudinal research of job crafting over different time intervals. Therefore, we will conduct a multi-wave person-oriented analysis in a weekly diary design that will also consider Psychological Capital (PsyCap; Luthans, Youssef, & Avolio, 2007), which may influence the kind of job crafting style, as well as relate these styles to work engagement at a later point in time. We also attempt to use this research design, to assess whether workers employed the same job crafting style every week. As far as we are aware, this will be the first person-oriented analysis to include a personal resource as an antecedent to job crafting style. We hope to contribute to the literature insights regarding (1) how resources are involved in the proactive generation of further resources through job crafting strategies, (2) how there may be homogeneous subgroups of job crafting profiles, and (3) how weekly job crafting profiles relate to work engagement the next week.

### *2.2.3. Theoretical Background*

#### *2.2.3.1. Approaches to job crafting*

In the Job Demands-Resources Model (JD-R; Demerouti et al., 2001), job crafting is conceptualized as a proactive process by which workers make changes to their jobs to achieve a better fit between their abilities and their job demands, as well as their needs and organizational supplies as discussed in the person-environment-fit (P-E-Fit) concept (Bakker & Demerouti, 2017). This improved fit between a job and the worker's preferences and capabilities can be achieved by increasing resources and decreasing demands on the job.

According to Bakker and Demerouti (2017), job resources are those factors and conditions in a job that enable goal achievement, growth, performance, and mitigate adverse effects from job demands, which lead to undesirable outcomes. There are other conceptualizations of job crafting which also include crafting ones' role and meaning of the job (Wrzesniewski & Dutton, 2001). However, this study will be focusing on the resource-based conceptualization of job crafting proposed by Tims and Bakker (2010). In this conceptualization, workers may be able to enhance their P-E-Fit by either increasing structural and relational job resources (e.g., asking for social support and feedback from coworkers and leaders), increasing challenging aspects of their jobs (e.g., taking on stretch assignments and responsibility), or decreasing hindrance demands (e.g., avoiding role conflicts and other aspects that drain energy). Based on this conceptualization, several researchers have devised frameworks to categorize a job crafting typology. For example, Laurence (2010) wrote about expansion and contraction focused job crafting behaviors, and Lichtenthaler and Fischbach (2018) called it promotion and prevention focused job crafting, based on Regulatory Focus Theory (Higgins, 1997).
A typology of job crafting may also be based on Conservation of Resources Theory (COR; Hobfoll et al., 2018). As a general stress theory, COR proposes that stress results from an individual's loss, perceived loss, or threat of loss of resources. Resources are defined as anything that an individual may value because it is needed to sustain the self. As a basic tenet of COR, individuals endeavor to acquire, keep, and guard those resources to sustain optimal functioning. Hobfoll et al. (2018) also described a Desperation Principle of COR, which prescribes that in situations when resources are stretched thinly, people will "enter a defensive mode to preserve the self […]" (p. 106). Accordingly, a lack of resources may shift a person's regulatory focus to adopt a prevention-focus. Therefore, it may be possible that the Desperation Principle would predict people to take on a defensive job crafting style by focusing primarily on minimizing resource loss, while an abundance of resources allows individuals to focus on promotion and further acquisition of resources.

The above-mentioned COR inherently introduces the question of antecedents of job crafting behaviors since the promotion-focus or prevention-focus of job crafting should depend on the availability of other resources. Prior research has shown that job characteristics such as work pressure and autonomy can affect job crafting behaviors (Petrou et al., 2012a). More recently, Rudolph et al. (2017) conducted a meta-analysis inquiring beyond job characteristics, also including personal characteristics that may serve as predictors of job crafting. The authors report to have found meta-analytic evidence that big-five personality dimensions, proactive personality, general self-efficacy, as well as promotion and prevention regulatory focus were significantly related to overall job crafting. Lichtenthaler and Fischbach (2018) investigated the antecedents for promotion-focused and prevention-focused job crafting in a meta-analysis as well. While these studies do provide evidence for the importance of job characteristics and individual differences as predictors for overall job crafting and distinct job crafting components, the literature tends to have focused primarily on dispositional and contextual factors to date. One goal of this study is to go beyond dispositional factors and investigate a more state-like personal resource that may be associated with job crafting, as positive organizational research has so far only considered personal resource and job crafting separately in form of interventions effectiveness studies (van Wingerden et al., 2017).

While the research we have highlighted above lends itself to making hypotheses about the kinds to job crafting constellations we are likely to find, the analyses that we will use are inherently exploratory methods. It may therefore be improper to form firm hypotheses that depend on a yet unknown number of latent profiles to be found. However, we have highlighted and discussed prior work on classifying job crafting approaches, as well as theoretical considerations as to what latent profiles we may find.

Regarding the number of latent Job crafting constellations, we will rely on the work by Lichtenthaler and Fischbach (2018), who used a variable-centric analysis, and Mäkikangas

(2018) person-oriented study of job crafting types. Both revealed a promotion focused and a prevention focused style.

> Proposition 1: We propose that it will be possible to find (at least) two types of job crafting in our sample of weekly job crafting. Namely, (1) promotion-focused profile characterized by a focus on gaining job resources and challenges, and (2) a prevention-focused profile characterized by a focus on decreasing hindrance demands.

#### *2.2.3.2. A personal resource (PsyCap) and its relation to job crafting*

Personal resources are thought of as those aspects a person values and needs to affect their environment successfully (Hobfoll et al., 2003). These personal resources can be directly used to achieve goals, but resources are also able to be used to acquire other resources that aid in goal achievement (Hobfoll et al., 2018). COR would certainly suggest that personal resources would be involved in the crafting of one's resources landscape at work. Evidence for such a reciprocal relationship emerged in a longitudinal study, in which personal resources and job resources were linked (Xanthopoulou et al., 2009). As job crafting is defined as a process by which workers gain job resources, challenging demands, and decrease hindering demands, it may be possible that personal resources may also play a reciprocal role in Job crafting behaviors.

One personal resource that has received increased attention in the literature is Psychological Capital (PsyCap; Luthans, Youssef, & Avolio, 2007). PsyCap is a higher-order construct consisting of four facets: hope, optimism, resilience, and (self) efficacy. Unlike dispositional personality traits, PsyCap is considered be a more malleable and trainable personal characteristic (Luthans, Avolio, et al., 2007). PsyCap has first been hypothesized and later been shown to be related to work engagement directly (Gruman & Saks, 2011). Since PsyCap is trainable, it has also been examined in an intervention study (van Wingerden et al., 2017). The authors showed how a PsyCap intervention paired with a job crafting intervention could

influence work engagement and job performance. Furthermore, PsyCap has been shown to be an antecedent of job crafting, leading to higher job satisfaction in individuals with higher levels of PsyCap in mediation analysis (Cenciotti et al., 2017). Other researchers interested in the reciprocal nature between PsyCap and job crafting have conducted a cross-lagged panel analyses and reported evidence that PsyCap was a consequence of job crafting, but not a predictor (Vogt et al., 2015). However, the authors discuss that further person-oriented analyses are needed because the interplay between PsyCap and job crafting behaviors may be more complex.

COR furthermore proposes that resources need to be invested, i.e., they need to be used to gain other resources (Resource Investment Principle; Hobfoll et al., 2018). Schaufeli and Taris (2014) have pointed out, how little is known about the precise role personal resources play in the stress response. The authors cite studies that show personal resources being (a) linked to positive outcomes directly, (b) moderating the effects of demands on outcomes, (c) mediating the effects of demands on outcomes, (d) impacting the perception of demands, and (e) acting as a "third variable" that could explain the relation between the perception of stressors and outcomes.

Since job crafting is an inherently proactive activity (employees engage in job crafting themselves, the job is not designed by somebody else), it makes sense that higher levels of hope, optimism, resilience, and self-efficacy should also lead to more proactive job crafting behaviors being observed. Conversely, according to the Desperation Principle of COR, participants who have low levels of the PsyCap personal resources will focus on preventing the loss of further resources in their job crafting.

> Proposition 2: Higher levels of PsyCap will be positively associated with promotion focused weekly job crafting, while lower levels of PsyCap will be associated with prevention focused weekly job crafting.

#### *2.2.3.3. Job crafting approaches and their relation to work engagement*

Job crafting is a process by which workers autonomously shape their resources landscape and is theorized to have a positive impact on work engagement in the JD-R (Bakker et al., 2014). However, previous research has yielded mixed results on how the individual factors of job crafting relate to work engagement. For example, there has been empirical support for the notion that increasing job resources are related to increased work engagement in some cross-sectional studies (Bakker et al., 2016; Brenninkmeijer & Hekkert-Koning, 2015; Demerouti, Bakker, & Gevers, 2015; Tims et al., 2013), but it has not been confirmed in longitudinal studies (e.g., Demerouti, Bakker, & Halbesleben, 2015; Harju et al., 2016; Petrou et al., 2012b). Similarly, the above-mentioned studies also report contradictory results in relation to increasing challenging demands and work engagement, while Demerouti, Bakker, and Gevers (2015) did not find a significant relationship between increasing challenging demands and work engagement. The picture regarding decreasing hindering job demands is mixed as well, as some studies did not find an effect (e.g., Bakker et al., 2016; Beer et al., 2016), while others found a negative effect on work engagement (e.g., Brenninkmeijer & Hekkert-Koning, 2015; Demerouti, Bakker, & Gevers, 2015). The abovementioned effects of promotion focused, and prevention focused job crafting have also been meta-analytically reviewed by Lichtenthaler and Fischbach (2018), who conclude that job crafting that focused on increasing job resources, challenge demands, and social resources was associated with increased work engagement and decreased burnout in variable-oriented analysis. The same effects have been reported in person-oriented analyses by Mäkikangas (2018).

> Proposition 3: Promotion focused weekly job crafting is related to higher levels of work engagement. Meanwhile, prevention focused weekly job crafting is associated with lower levels of work engagement.

### *2.2.4. Method*

#### *2.2.4.1. Sample*

Participants were recruited via snowball method using graduate students as recruiters in social networks and approaching organizations directly. For those participants who agreed to volunteer for this study, the data was collected every Friday over a four-week period. To keep time demands as low as possible for participants, between-level variables like demographics were only collected during the first time point. We only included participants who took part in at least three time points and have worked a minimum of 20 hours per week. This resulted in a sample of 348 weekly observations nested in 104 persons. The sample was 65.60% female, had a mean age of 35.79 years (*SD*=13.00) and 12.59 years of work experience (*SD*=12.45). 73.30% worked full-time and 28.90% of participants were in temporary contracts. 79.90% of participants had completed upper secondary education, i.e., levels 3 and 4 of ISCED 2011.

#### *2.2.4.2. Measures*

*Job Crafting.* To measure job crafting, we used items from the German version of the Job Crafting Scale (Lichtenthaler & Fischbach, 2016), based on the Job Crafting Scale (JCS) by Tims et al. (2012). The German version was reported to show the factor structure of the four job crafting dimensions, reliability, construct validity, as well as good external validity. To reduce time demands on the participants, we only used three items from each job crafting domain and adapted the items to reflect the weekly nature of job crafting that we investigated (e.g., "During this work week, I tried to develop my capabilities" or "I have asked colleagues for advice this week"). On a five-point Likert-scale ranging from never (1) to always (5), participants indicated how often they engaged in each job crafting behavior during the week. This 12-item scale had a composite reliability (Geldhof et al., 2014) of .63. Additionally, we conducted a multi-level confirmatory factor analysis to ascertain the validity of the items we used. A four-factor model showed an adequate fit ($Chi^2$ = 350.34, df = 114, p <.01, RMSEA =

.08, $SRMR_{within}$ = .08) and was preferable to a one-factor model ($Chi^2$ = 528.42, df = 120, p <.01, RMSEA = .10, $SRMR_{within}$ = .10).

*Work Engagement.* Work Engagement was assessed using the German version of the Utrecht Work Engagement Scale (UWES-9; Sautier et al., 2015). The scale contained a total of nine items, with three items for each of the dimensions of Work Engagement (vigor, dedication, and absorption). The scale was reported to have good psychometric properties for both the three factor and one overall factor structure. To fit with the weekly study design, the items were only slightly adapted (e.g., "When working this week, I was bursting with energy" or "I am proud of my work this week"). Participants indicated how much the items described them over the last week on a seven-point Likert-scale ranging from "never" (1) to "always" (7). The scale showed a composite reliability of .94.

*Psychological Capital.* To measure four components of PsyCap, we utilized a German version of the Compound PsyCap Scale (CPC-12; Lorenz et al., 2016). This scale abstains from work-related connotations in the items but has still been shown to relate to work-related positive psychological constructs such as meaning of work, proactive attitude, and work engagement. It contains of a total of twelve items, with three items for each of the PsyCap components hope, optimism, resilience, and (self-)efficacy (e.g., "If I should find myself in a jam, I could think of many ways to get out of it" or "The future holds a lot of good in store for me"). Participants indicated to what degree these items described them on a six-point Likert-scale, keeping with the format the scale had been validated with by Lorenz et al. (2016). The PsyCap scale had a composite reliability of .91.

#### *2.2.4.3. Analytical Strategy*

Latent Profile Analysis (LPA) is a member of the finite mixture modelling family (Robertson & Kaptein, 2016). LPA is a technique that makes it possible to recover homogeneous subgroups in observed data. LPA has recently become more widespread in work and organizational psychology research to uncover subgroups of behavior in a given sample. For example,

researchers have investigated latent profiles of emotional labor strategies (Gabriel et al., 2015), occupational stress and mental health profiles in relation to physical exercise (Gerber et al., 2014), a typology of career burglars (Vaughn et al., 2008), or prior research on job crafting profiles (Mäkikangas, 2018). Similarly, using the scores on job crafting dimensions that participants of our study endorsed, it may be possible to find homogeneous subgroups of job crafting styles.

The first step in conducting an LPA is establishing the number of latent profiles contained in the data. We will therefore begin with an unrestricted multilevel model of the four weekly indicator variables (increasing job and social resources, increasing challenge demands, and decreasing hindrance demands) with an increasing number of latent profiles. Multilevel modeling using the type = complex function in Mplus will allow us to account for the nested structure of the data (weeks nested within persons). Model selection for the best fitting model will be based on several fit indices, such as the Bayesian Information Criterion (BIC) and the Lo-Mendel-Rubin Likelihood-Ratio-Tests (LMR-LRT). Once the best fitting number of latent profiles has been established, we will include auxiliary variables into the model.

In the next step, we will include PsyCap as profile predictor into the model. Since the job crafting style may in part depend on other factors than PsyCap, we will also statistically control for work experience. The amount of time one has spent in the workforce could for example impact the amount and the quality of relationships at work (Park et al., 2015), which could impact the ability to craft social resources.

In a similar fashion, we will include the following week's work engagement as distal outcome. We will use the lead function in SPSS to add the following week's work engagement into the same row as all other variables the week before. This procedure will allow us to compare work engagement at t+1 for each of the latent profiles we will find, using the BCH method implemented in Mplus (Asparouhov & Muthén, 2014a). Thus, we will be able to control for

work engagement curing the current week, enabling us to test for differences in the change of weekly work engagement as well.

### *2.2.5. Results*

First, we present the multilevel correlation coefficients and the intraclass correlation coefficient (ICC) in the following table. The ICC (shown in Table 8) shows that a substantial proportion of variance can be attributed to within-person aspects. Particularly in the job crafting dimensions, more variance was attributable at the weekly level than compared to PsyCap and work engagement. However, the majority of variance was attributable to the between level (i.e., the differences between participants) on all measured constructs.

Table 8 - *Standardized correlation coefficients*

| | **Variable** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|---|---|---|---|
| 1 | PsyCap | (.25) | -.07 | .53** | -.21 | .43** | -.09 | .67** | .66* |
| 2 | Work Experience | -- | -- | .11 | -.43** | .00 | -.05 | -.02 | -.02 |
| 3 | Increasing Job Resources | .31** | -- | (.46) | -.12 | .34** | .02 | .60** | .62** |
| 4 | Increasing Social Resources | .14° | -- | .14* | (.45) | .20° | .26* | .00 | .01 |
| 5 | Increasing Challenging Demands | .10 | -- | .23** | .18* | (.35) | .27* | .60** | .60** |
| 6 | Decreasing Hindrance Demands | -.12 | -- | -.10° | .09 | -.04 | (.43) | -.14 | -.11 |
| 7 | Work Engagement | .42** | -- | .28** | .10 | .22** | -.15* | (.26) | .99** |
| 8 | Work Engagement at t+1 | -.06 | -- | -.02 | -.05 | -.11 | -.03 | -.11 | (.24) |

Note: *** p < .01, * p < .05, ° p < .10; within level at the lower diagonal, between level at the upper diagonal; 1-ICC in parentheses*

Nonetheless, the ICC and multilevel correlation underscore the importance of accounting for the nested structure of the data. Therefore, we conducted several multilevel LPAs, specifying an increasing number of latent profiles. Table 9 depicts the profile proportions and various fit indices.

Table 9 - *LPA enumeration in unconditional models*

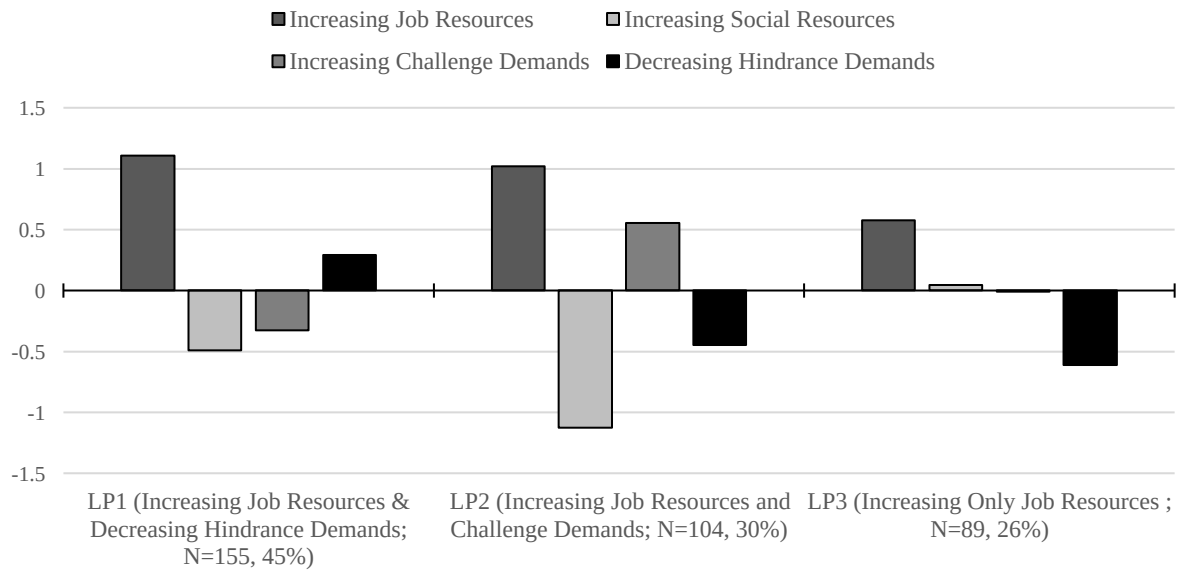
| Latent Profiles | Profile Count | Proportion | Entropy | AIC | BIC | Adj. BIC | LMR Adj. LRT |
|---|---|---|---|---|---|---|---|
| 1 | 348 | 1.00 | | 3262.50 | 3293.31 | 3267.94 | |
| 1 | 155 | .45 | .57 | 3211.19 | 3161.27 | 3220.03 | p = .12 |
| 2 | 193 | .55 | | | | | |
| **1** | **155** | **.45** | **.67** | **3165.65** | **3234.99** | **3177.88** | **p = .03** |
| **2** | **104** | **.30** | | | | | |
| **3** | **89** | **.25** | | | | | |
| 1 | 96 | .28 | .62 | 3159.67 | 3248.27 | 3175.31 | p = .60 |
| 2 | 64 | .18 | | | | | |
| 3 | 96 | .28 | | | | | |
| 4 | 92 | .26 | | | | | |
| 1 | 29 | .08 | .64 | 3154.32 | 3262.18 | 3173.36 | p = .66 |
| 2 | 69 | .20 | | | | | |
| 3 | 84 | .24 | | | | | |
| 4 | 82 | .24 | | | | | |
| 5 | 84 | .24 | | | | | |
| 1 | 34 | .10 | .71 | 3148.24 | 3275.36 | 3170.68 | p = .69 |
| 2 | 91 | .26 | | | | | |
| 3 | 67 | .19 | | | | | |
| 4 | 46 | .13 | | | | | |
| 5 | 57 | .16 | | | | | |
| 6 | 53 | .15 | | | | | |
| 1 | 36 | .10 | .72 | 3133.37 | 3279.76 | 3159.21 | p = .26 |
| 2 | 68 | .20 | | | | | |
| 3 | 46 | .13 | | | | | |
| 4 | 21 | .06 | | | | | |
| 5 | 73 | .21 | | | | | |
| 6 | 51 | .15 | | | | | |
| 7 | 53 | .15 | | | | | |
| 8 | * | * | .74 | 3126.57 | 3292.21 | 3155.80 | p = .50 |
| 9 | * | * | .76 | 3119.43 | 3304.34 | 3152.07 | p = .75 |

Note: * *Profile count and proportions omitted to save space*

Both the Bayesian Information Criterion and Lo-Mendel-Rubin Adjusted Likelihood Ratio Tests point towards the three-class model fitting the data better than the proposed two profile solution. Figure 4 depicts the response probabilities of the latent profiles of the three-profile solution. The largest proportion was made up of a profile of participants that sought to increase their structural job resources during the week (i.e., learning new things and developing one's skills, or gaining some autonomy on how to do one's work) while to a lesser extent focusing on decreasing hindrance demands as well. The second latent profile also endorsed increasing structural job resources, but also endorsed having increased challenge demands (i.e., proactively seeking new projects, taking on extra tasks, creating synergies

between various aspects of one's job). The third latent profile endorsed only increasing job resources. Interestingly, decreasing hindrance demands did not become a defining feature of any of the latent profiles of weekly job crafting. Instead, one profile endorsed using this strategy only in combination with also increasing job resources. These results are therefore contrary to the approach-avoidance taxonomy that was proposed. Consequently, we have no sound support for Proposition 1. Instead, we have found three profiles of approach focused job crafting or ambivalent crafting, combining both approach and avoidance in the same strategy.

Figure 5 – *Multilevel profile plot*




Considering the different number of latent profiles, the results also have an impact on Proposition 2 that PsyCap will be associated with an approach focused job crafting style. Multinomial regression indicated that higher levels of PsyCap were associated with an increased likelihood of belonging into the latent profile that endorsed increasing structural job resources and increasing challenging demands (see Table 10).

Table 10 - *Multinomial regression, predicting class membership, using latent profile 2 as a reference*

| | **Latent Profile 1** | | **Latent Profile 3** | |
|---|---|---|---|---|
| | **γ (SE)** | **OR [$CI_{95\%}$]** | **γ (SE)** | **OR [$CI_{95\%}$]** |
| PsyCap | -1.96** (.50) | .14 [.05;.37] | -1.45* (.52) | .23 [.08;.65] |
| Work Experience | .04 (.02) | .96 [.92;1.01] | -.10* (.04) | .91 [.84; .97] |

Note. ** $p < .05$, ** $p < .001$, $\gamma$ = unstandardized estimate, $CI_{95\%}$ = 95% confidence interval, OR = odds ratio, SE = standard error*

Proposition 2 can therefore not be supported, as the latent profile solution was different than suggested in Proposition 1. Instead PsyCap was associated with an increased probability of belonging to a promotion focused latent profile that distinguished by increasing job resources and challenge demands, compared to other promotion focused latent profiles.

The same constraint needs to be applied to Proposition 3 that promotion focused job crafting will be associated with higher work engagement than avoidance focused jo crafting. As Table 11 shows, there were significant differences in Work Engagement between all the three-promotion focused latent profiles. The increasing job resources and increasing challenge demands latent profile recorded the highest levels of weekly work engagement, which was significantly different from the other classes during the same week, as well as the next week (controlling for work engagement the previous week). While we cannot report higher levels of work engagement for promotion focused over avoidance focused job crafting, our analysis did reveal interesting differences within the promotion focused profiles that we have found.

Table 11 - *Wald-chi² tests of work engagement*

| **Latent Profile Description** | **M** | **$r_{st}$** | **Wald Chi² Tests (p-values)** | | |
|---|---|---|---|---|---|
| | | | **1** | **2** | **3** |
| Increasing Job Resources and Decreasing Hindrance Demands | 3.99 | .82** | -- | 8.04 (.00**) | 18.13 (.00**) |
| Increasing Job Resources and Challenge Demands | 5.31 | ° | 55.93 (.00**) | -- | 35.07 (.00**) |
| Increasing Only Job Resources | 4.71 | -.44 | 14.98 (.00**) | 8.07 (.00**) | -- |

Note. ** *p < .001;* ° *$r_{st}$ could not be estimated for this class because a parameter was fixed to avoid singularity of the information matrix; M = estimated means of Work Engagement in the same week, $r_{st}$ = stability coefficient of Work Engagement (i.e. the correlation of Work Engagement at T and T+1 week Work Engagement within each latent profile); lower diagonal depicts Chi² values at t; upper diagonal depicts Chi² values comparing t+1 week Work Engagement controlled for Work Engagement at t*

### *2.2.6. Discussion*

The LPA on this sample has resulted in three profiles of promotion focused weekly job crafting, as opposed to the proposed two profiles of promotion focused and prevention focused. The personal resource PsyCap was significantly associated with belonging to the profile that sought to increase both job resources, as well as challenging job demands. Compared to the other two profiles, this profile also had the highest levels of work engagement during the following week. This may have implications for the conceptualization of job crafting as based on the regulatory

focus of the individual, COR, and the JD-R model, which we will discuss in the following section.

First, we would like to address the surprising types of job crafting profiles our analysis has shown. Unlike the expected two profiles, which regulatory focus theory (Higgins, 1997) would suggest, all latent profiles could be considered distinct types of promotion-focused crafting. This may call into question the a priori classification into promotion-focused and prevention-focused job crafting proposed by Mäkikangas (2018) and Lichtenthaler and Fischbach (2018). The defensive job crafting class identified by Mäkikangas (2018) was exceedingly small. Ninety-four percent of participants were reported to be in the promotion-focused profile. In a variable-centric analysis, Rudolph et al. (2017) conducted a meta-analytic confirmatory factor analysis on the job crafting dimensions and reported little support for the decreasing hindrance stressors dimension loading onto an overall job crafting factor. Combining these findings with our results may have two implications for the conceptualization of job crafting. For one, there may be three proactive latent job crafting profiles instead of a prevention-focused and promotion-focused profile. This may call into question the usefulness of regulatory focus theory for job crafting. As job crafting is an inherently proactive activity, job crafting seems to take on more promotion-focused facets over prevention-focused facets. Secondly, the usefulness of including decreasing hindrance demands as component of job crafting may be called into question. As F. Zhang and Parker (2018) point out in a variable-centric meta-analysis, promotion-focused job crafting seems closely related to other proactive behaviors, while the vast majority of reviewed studies “indicated negative effects” (p.139) of prevention-focused job crafting. If job crafting inherently contains such a strong proactive/promotion-focus component, it would be more helpful to develop a theory that could explain different patterns/styles of promotion-focused job crafting, rather than including the decreasing hindrance demands component in the conceptualization of job crafting.

Regarding the role of PsyCap as a predictor of latent profile membership, the personal resource as shown to be associated with the latent job crafting profile that reported the highest levels of work engagement. In its usual conceptualization, the JD-R model would stipulate that personal resources lead to work engagement, and job crafting is the recuperative process by which work engagement may lead to the acquisition of more resources. Our results point the possibility, that personal resources could be linked to the type of job crafting an employee engages in, which in turn may affect work engagement. This is in line with meta-analytic evidence of variable-centric studies indicating that PsyCap is associated with approach crafting, but not avoidance crafting (F. Zhang & Parker, 2018). This version of the process seems to also be in line with COR, as a personal resource could be seen to be invested to gain more resources through job crafting. However, the desperation principle of COR also stipulates that people will become more defensive when they are faced with a lack of resources. In other words, COR would also have predicted that lower levels of PsyCap would be associated with an avoidance focused job crafting style, which we did not find.

Interestingly, more PsyCap did not lead to more job crafting dimensions being applied. Similarly, the highest work engagement was found in a profile that was high in increasing job resources and increasing challenge demands, and not in the profile which utilized all three proactive job crafting dimensions. Therefore, generating the "right kind" of resources (i.e., performing the "right kind" of job crafting) seemed more important than using more job crafting dimensions. So far, COR does not include tenets and corollaries about the right composition of resources. However, other researchers have found that for resources to effectively mitigate the effects of demands, the resource needs to match the demand (Jonge et al., 2008). It may become necessary to include a matching-principle into COR, as our results indicate that more dimensions for job crafting do not lead to increased work engagement per se. Instead, selecting the relevant job crafting dimensions seemed to have a greater impact on well-being than applying all proactive job crafting dimensions.

Furthermore, the latent profile that applied both increasing job resources and increasing challenge demands posits additional interesting questions about the nature of demands. Challenge demands have long been the subject of research interest, since they were first found to be related to performance (LePine et al., 2005) and engagement (Crawford et al., 2010b). This latent profile was associated with both the highest reported levels of PsyCap and work engagement. As Min et al. (2015) showed, higher levels of PsyCap may boost the effects of challenge demands on work engagement. From a COR perspective, possessing a personal resource like PsyCap may allow individuals to invest that resource into "risky" job crafting strategies that include the increase of certain demands - and may in turn "earn" greater returns than individuals primarily crafting for increasing structural job resources only or focusing on decreasing hindrance demands. Future research may consider the combined effects of structural job resource and challenge demands crafting, as opposed to the promotion/prevention dichotomy predominating the literature to date.

#### *2.2.6.1. Practical implications*

When designing job crafting interventions, the results of this person-oriented study showed that personal resources, particularly PsyCap, can play a significant role in how workers engage in job crafting. It may therefore be important to incorporate workers' personal resources in the job crafting process. Additionally, combined with meta-analytic variable-centric evidence, our results may highlight the usefulness of practicing approach/promotion-focused job crafting. Promotion-focused job crafting that is focused on a combination of increasing structural job resources and challenges seems more effective in generating work engagement than avoidance-focused crafting, which only pursues the prevention of hindering demands. Focusing on gaining PsyCap and practicing proactive/promotion-focused job crafting that includes seeking challenges may be a fruitful avenue in order to allow workers to thrive/flourish and not languish at work.

#### *2.2.6.2. Limitations*

One limitation of our study was that the entropy value would indicate a low separation of profiles. There is no cut-off value for the classification quality of the latent profile solution, but an entropy value approaching 1.00 usually indicates better delineation of profiles (Celeux & Soromenho, 1996). Sometimes profile separation can be improved by allowing for residual covariance and/or including covariates. Therefore, we have rerun the model allowing the indicator variables to be correlated, as well as including PsyCap and work experience as covariates. Entropy in the 3-profile model rose to .68 and .75, respectively. However, a higher entropy value is not the only indicator of profile separation. Another way to establish classification quality is when profile counts/proportions based on estimated posterior probabilities and most likely profile membership yield comparable results. Profile sizes based on the estimated posterior probabilities yielded 154.73, 102.21, and 91.06. Compared to the profile size estimates based on most likely profile membership (155, 104, 89) there were only minor discrepancies. This would lead us to conclude that despite a lower entropy value, our latent profiles were well enough separated to be useful for further analysis of a distal outcome. Additionally, we want to caution the reader about the lacking representativeness of the data. While we believe that we have a typical sample for work and organizational psychological research (two-thirds female, twelve and a half years of average work experience), the sample is far from representative. To establish the external validity of the job crafting profiles we have found, a representative sample that accurately depicts the working population would be needed. We would welcome job crafting research questions to be included in representative panel studies in the future.

To stave off participant dropout, we selected only 12 items from the German version of the JCS. The composite reliability of .63 was below the commonly accepted threshold of .70, but still on the realm of what can be considered acceptable (Hu & Bentler, 1999). In the future, it

could be beneficial to examine weekly job crafting utilizing the entire validated job crafting scale.

Our conceptualization of job crafting was purely focused on job demands and resources, missing other components such as cognitive crafting (Wrzesniewski & Dutton, 2001). In the future, it may be worthwhile to also include other job crafting dimensions into person-oriented analyses. One may find only distinct types of promotion focused job crafting again, or the inclusion of cognitive crafting may offer completely different job crafting profiles then.

#### *2.2.6.3. Conclusion*

This study presented the role the personal resource PsyCap can play in person-oriented, weekly job crafting. It may therefore contribute to our understanding of the role personal resources play in the JD-R (as predictors of types of job crafting behaviors), as well as enhance our understanding of the principle of resource investment proposed by COR.

Additionally, this person-oriented investigation of job crafting revealed the proactive nature of weekly job crafting. Rather than engaging in approach-focused and avoidance-focused job crafting, as Regulatory Focus Theory would suggest, participants displayed three distinct types of approach-focused job crafting. Given the many debates over the exact conceptualization of job crafting (see Y. Zhang et al., 2019 or F. Zhang & Parker, 2018), this study may further highlight the importance of understanding job crafting as an inherently proactive concept, as opposed to one consisting of approach and avoidance components.

## 2.3. Tenets of Self-Determination Theory as a mechanism behind challenge demands: A within-person study

### *2.3.1. Abstract*

**Purpose** – This study investigates a mechanism by which challenge stressors may affect employee well-being outcomes. Therefore, this study will test a within-person longitudinal model in which the effects of challenge demands relate to basic psychological need satisfaction/thwarting and worker well-being outcomes. In particular, basic psychological need satisfaction and thwarting were hypothesized to mediate challenge demands and outcomes at the intra-individual level.

**Design** – Data from 84 employees from a weekly survey across 4 weeks (308 observations) were used in Bayesian multilevel path analyses to test hypotheses.

**Findings** – While there were significant indirect effects, showing that basic psychological needs mediate between demands and worker outcomes, only a few specific indirect effects (e.g., the path from time pressure via thwarting the need for autonomy to emotional exhaustion) operated as hypothesized. Interestingly, in this study, time pressure was only mediated via thwarting the need for autonomy to undesirable worker outcomes (i.e., increased emotional exhaustion, decreased job satisfaction). Job complexity, however, led to decreased emotional exhaustion via the need for competence satisfaction. Implications for need satisfaction and thwarting as mechanisms in the challenge-hindrance framework are discussed.

**Value** – This study (1) extends the challenge-hindrance framework to include basic psychological needs as a mechanism, (2) expands basic psychological needs to include need thwarting, and (3) may enhance our understanding of stressor categories.

Keywords: challenge demands, self-determination theory, basic psychological needs satisfaction and thwarting

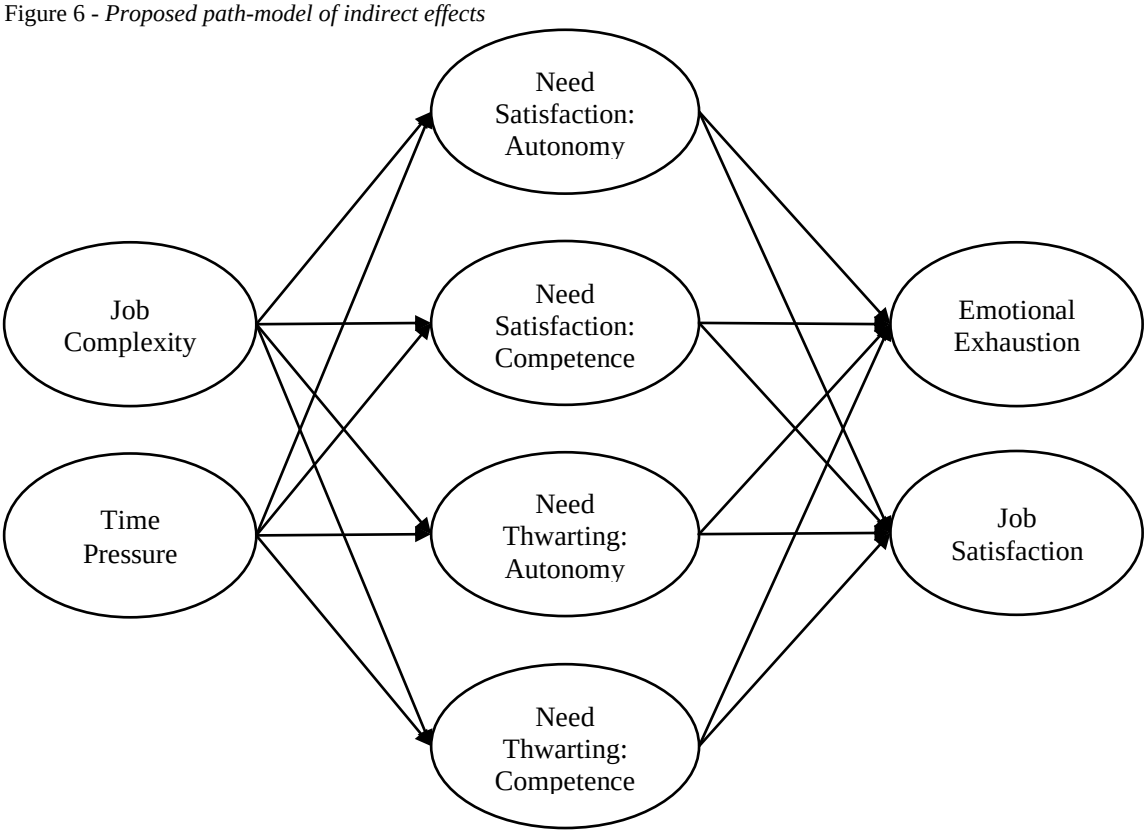
### *2.3.2. Introduction*

The job demands-resources model (JD-R; Bakker & Demerouti, 2007) asserts that job characteristics can broadly be classified as demands and resources depending on their association with employee strain or motivation. However, evidence has emerged that some demands may be associated with both strain and motivation (Cavanaugh et al., 2000). For example, meta-analytic evidence by Crawford et al. (2010a) indicated that some kinds of job demands, such as job responsibility, time pressure, and workload, showed expected negative employee outcomes as well as positive outcomes. This has led researchers to further categorize stressors into challenging and hindering demands. However, this a priori categorization remains a topic of debate (Searle & Auton, 2015). Investigating mechanisms how challenge demands unfold their challenging potential seems a fruitful avenue to back up this discussion. So far, especially stressor appraisals have been investigated as mechanisms behind challenge stressors (e.g., Webster et al., 2011). However, such subjective evaluations of a stressor are by their definition idiosyncratic. We hope to provide another explanation for the ambivalent effects of challenge stressors that does not depend on the individual's appraisal of a stressor but are in a sense more generic and perhaps generalizable.

Researchers have proposed to integrate self-determination theory (SDT; Ryan & Deci, 2000), specifically the concept of basic psychological need (BPN) satisfaction, as a mechanism between job demands and employee outcomes (Deci et al., 2017; Gieter et al., 2018; Schaufeli & Taris, 2014). A meta-analysis by van den Broeck et al. (2016) reviewed and analyzed over 100 studies of BPN in a work context and showed a clear link between BPN satisfaction at work and employee outcomes (e.g., affective commitment, turnover intentions, and general well-being). However, few studies have investigated BPN specifically in the context of challenge demands to date (e.g., Albrecht, 2015; Gieter et al., 2018; Olafsen & Frølund, 2018). Even newer is the idea of BPN thwarting as a related mechanism to basic need satisfaction by which strain develops. We address some of these gaps in this study.

Specifically, we propose that the abovementioned ambivalent effects of challenge demands result from their potential to both satisfy and thwart BPN and, in turn, lead to positive as well as negative outcomes. We hope that our work will improve and build upon current research in several ways: (a) by providing a less idiosyncratic mechanism by which challenge demands may generate their ambivalent effects and, therefore, enhance our understanding of stressor categories, (b) by extending research to include the concept of BPN thwarting on the strain path of the JD-R model, and (c) by considering the intra-individual-level effects of basic need satisfaction and thwarting.

Figure 6 - *Proposed path-model of indirect effects*




First, we will outline the challenge-hindrance framework in more detail before linking it to SDT concepts of BPN satisfaction and thwarting and integrating the concepts of challenge demands and SDT. Next, we will outline current empirical work introducing BPN as the process for ambivalent effects of challenge stressors.

#### *2.3.2.1. Challenge-Hindrance Framework*

Demerouti et al. (2001) conceptualized in the JD-R model that work environments can contain two types of characteristics: work-related resources and demands. According to the authors, resources are the physical, social, organizational, or psychological aspects of the job that have the potential to motivate, help reach goals, and help deal with job demands. Conversely, job demands are any aspects of the work environment that drain energy. Many studies have provided evidence for the core proposition of the JD-R that job demands and resources induce two discrete psychological processes to influence worker well-being (Schaufeli & Taris, 2014). Job resources are the psychological and organizational aspects of the job that produce motivation as well as positive work and well-being outcomes. Job demands, on the other hand, induce strain by depleting energy. Consequently, strained employees show diminished job performance and increased burnout (Schaufeli et al., 2009). This separation of job characteristics into job demands and resources has found wide acceptance in occupational health research (Bakker & Demerouti, 2017). However, the categorization of only two types of characteristics has recently come under scrutiny. For one, researchers have identified and investigated job characteristics that have both motivational and energy-draining characteristics (Cavanaugh et al., 2000; Podsakoff et al., 2007; van den Broeck et al., 2010). These studies provide some evidence that it may be necessary to integrate a third category of challenge demands in the model. Typical examples for such challenge demands are workload, time pressure, and cognitive demands. Widmer et al. (2012) coined the term *ambivalence of challenge stressors* and showed that challenge demands can deplete employees' energy *and* stimulate positive affect at the same time. However, little is known about the mechanisms of how these ambivalent effects from challenge stressors to both positive and negative worker outcomes are transmitted. We introduce BPN satisfaction and thwarting as possible mediators in the challenge-demand–employee-outcome relationship in the following paragraphs.

#### *2.3.2.2. SDT: Basic need satisfaction and thwarting*

Around the same time as researchers explored the need to classify job characteristics into three categories, Ryan and Deci (2000) conceptualized SDT and its component of BPN as a motivational theory. According to SDT, for people to realize their potential, the basic needs for autonomy, competence, and relatedness need to be met. The need for autonomy refers to an individual's sense of volition (i.e., an ability to choose their path and decide on their actions). The need for competence describes an individual's desire to feel effective when interacting with their environment (White, 1959). Relatedness is defined as a desire for interpersonal attachments (i.e., to be connected and accepted by others; Baumeister & Leary, 1995). Because SDT is a theory of motivation, BPNs soon garnered attention as a potential process by which job characteristics affected organizational and worker outcomes (van den Broeck et al., 2008). It is only recently that research has started to investigate BPNs in the challenge-hindrance framework, such as Albrecht (2015), Olafsen and Frølund (2018), de Gieter et al. (2018), or Verbruggen et al. (2015). Nonetheless, several conceptual and empirical issues remain, which we will highlight in the following section.

#### *2.3.2.3. Basic psychological needs as mediators between challenge demands and worker outcomes*

Meta-analytic evidence has emerged showing that the tenets of SDT lend themselves as a practical conceptional framework by which to study health and well-being outcomes (Ng et al., 2012). Schaufeli and Taris (2014) integrated the notion of BPN satisfaction in the revised JD-R because, in their view, job resources can stimulate the motivational path of the JD-R through the satisfaction on BPN. However, their review does not consider extending this process to the job-demands-to-strain path through the thwarting of BPN. Nor does it suggest that challenge demands could influence both the motivational and strain paths through satisfaction and thwarting of BPN. In the following section, we will first highlight some empirical evidence linking the satisfaction of BPN to well-being outcomes. Next, we will offer examples of the

literature regarding the necessity to include need thwarting as a mechanism in the strain path of the JD-R model. Lastly, we will weigh the importance of conducting multilevel analyses in this section before stating our hypotheses.

Several studies have shown BPN satisfaction to be related to various worker outcomes, such as performance and well-being (Baard et al., 2004) or burnout (Fernet et al., 2013). Aldrup et al. (2017) studied BPNs as mediators between stress exposure and well-being in teachers. However, as Bartholomew et al. (2011) suggested, although low need satisfaction may be associated with ill-being, it may be necessary to consider need thwarting as a construct as well. Similarly, van den Broeck et al. (2016) criticized that the absence of need satisfaction should not be considered the equivalent of need thwarting. The authors suggest that it is necessary to not only consider the satisfaction of BPN but also important to explicitly consider the thwarting of BPN when investigating worker outcomes. The authors propose that "positive and negative events are not simply opposite ends of a spectrum, as the absence of a positive does not imply a negative and the absence of a negative does not imply a positive" (p. 1221). This question of whether the lack of a psychological phenomenon constitutes the same as the opposite of said phenomenon is a common question in psychological research. For example, Goering et al. (2017) conducted a meta-analysis of the work engagement and burnout literature to discern whether burnout is simply the absence of work engagement or if these are distinct but related constructs. Another example is breach vs. fulfillment of psychological contracts, as they are not two opposite ends of the same continuum but have differential effects (Lambert et al., 2003). Regarding psychological needs, Bartholomew et al. (2014) investigated the effects of the hindrance demand of job pressure on ill-health in teachers, mediated by BPN thwarting. Olafsen et al. (2016) also began looking into need thwarting as a predictor of negative worker outcomes (turnover intention, emotional exhaustion, and absenteeism) via stress and somatic symptom burden. However, that study did not consider any job characteristics as predictors for the need-thwarting-to-negative-outcome path. Both abovementioned studies only considered the need-

thwarting-to-strain path. While Albrecht (2015) and de Gieter et al. (2018) did consider challenge and hindrance demands in the context of BPN, these studies only assessed the satisfaction of BPN. De Cooman et al. (2013) also showed a positive relationship between the challenge demand of work pressure and need satisfaction. The authors argued that to cope with challenge demands, workers become proactive and use their competencies, which in turn will satisfy autonomy and competence needs. Given that the satisfaction of BPN has been considered a process by which job resources affect well-being, combined with the research showing the necessity of distinguishing between satisfaction and thwarting of BPN, it may be logical to conceive of need satisfaction as a mechanism on the motivational path of the JD-R with need thwarting as its counterpart on the strain path.

In the context of the challenge-hindrance framework (Crawford et al., 2010a), it is conceivable that the ambivalent effects of challenge demands could arise due to the dual pathways of being both need satisfying and need thwarting. This idea of dual pathways has taken hold in sport psychology, as Jowett et al. (2016) proposed BPN as a mediator between perfectionism and engagement/burnout in young athletes. The authors showed that perfectionism had ambivalent effects, as perfectionistic striving led to engagement via need satisfaction, whereas perfectionistic concerns led to athlete burnout via need thwarting. In the occupational health psychology literature, Trépanier et al. (2015) investigated BPN satisfaction and thwarting as a mechanism linking job characteristics to employee functioning. They found that job resources were linked to work engagement via need satisfaction, whereas job demands were linked to psychological distress via need thwarting. However, this study did not categorize challenge and hindrance demands. Gillet et al. (2015) proposed both satisfaction and thwarting of BPN as a process between ambiguities about work as well as changes in tasks and work outcomes. This study found ambivalent effects of those demands; however, the authors did not consider this process to occur in parallel. Instead, the authors reported two studies: one with need satisfaction leading to work engagement and one with need thwarting leading to burnout. As far as we are

aware, our study is the first to propose both need satisfaction and need thwarting as parallel mediators between challenge demands and both positive and negative worker outcomes.

Additionally, Bakker (2014) called for a better understanding of job demands at different levels of analysis. As Rousseau (1985) suggested, it is of vital importance for research to consider the level of analysis to aid in the development of theory at the appropriate levels. Just as organizational processes may unfold differently at the individual and organizational level, worker well-being processes may relate differently at the intra-individual level and the inter-individual level (Sonnentag & Ilies, 2011). Yet, substantive research is still lacking, as previous studies on job characteristics and BPN focused mostly on cross-sectional and between-subject levels of analyses (van den Broeck et al., 2016). Recently, Prem et al. (2018) took a multilevel approach and considered both intra-individual and between-level effects of the challenge demand of time pressure on task performance via proactive work behavior and emotional exhaustion. Although the authors did find some differences at various levels of analysis, this study did not consider BPNs as mechanisms for this relationship. Gieter et al. (2018) also took a multilevel approach by conducting a daily diary study of job characteristics in relation to strain and performance via need satisfaction but did not consider need thwarting as an alternative pathway for challenge demands. The same is true for Aldrup et al. (2017) study of BPN satisfaction in teachers. We will, therefore, build upon these studies and contribute to the literature a study that considers both satisfaction and thwarting of BPN as a mediator between challenge demands and worker outcomes at the intra-individual level using a weekly diary study design. This weekly design allows insights into the intra-individual processes. While job characteristics and well-being outcomes can fluctuate from day to day, authors have shown that well-being remains relatively stable within persons (Chrisopoulos et al., 2010). Similarly, the satisfaction and thwarting of BPNs can develop in the process of completing complex jobs, which are not completed in a single day. Using the workweek as the time scale of analysis allows us to capture the effects of challenge demands on more complex tasks (e.g., the

completion of projects that took more than 1 day to complete). By investigating a slightly different timescale as the abovementioned daily diary studies, we hope to provide a better understanding of the process by which job demands affect work outcomes, which may enhance our understanding of challenge demands and the role they play in the JD-R model.

#### *2.3.2.4. Choice of dependent and independent variables*

Since challenge demands can generate positive and negative well-being outcomes simultaneously (Widmer et al., 2012), we found it necessary to test a range of what could be considered positive and negative worker outcomes. For one, we included emotional exhaustion (Büssig & Perrar, 1992) as a negative well-being outcome. Job satisfaction, on the other hand, involves a positive evaluative judgment about one's job and Diener et al. (2003) classified satisfaction as one of three elements of positive well-being.

van den Broeck et al. (2016) provided an extensive review and meta-analysis of BPNs at work, in which the authors identified a panoply of effects between job characteristics and BPNs. For example, the article provided meta-analytic evidence for the relationships between challenge demands, such as workload or cognitive demands, and BPN. The review showed significant effects between workload and all three facets of BPN (autonomy, competence, relatedness). However, other job characteristics were not included in that meta-analysis. For example, Morgeson and Humphrey (2006) identified several knowledge characteristics that captured "knowledge, skill, and ability demands that are placed on an individual as a function of what is done on the job" (p. 1323). One such knowledge characteristic, job complexity, describes work that contains multifaceted tasks and various high-level skills. This variable nicely captures the essence of challenge demands, as it is psychologically demanding and motivating at the same time. It is conceivable that job complexity can provide an opportunity to demonstrate competence and thereby satisfy that need, while it can also become overwhelming and thwart BPN. Yet, job complexity has received little attention in the challenge-hindrance literature, as its absence from van den Broeck et al. (2016) meta-analysis shows. The meta-

analysis contained only a knowledge characteristic operationalized as skill variety. The studies showed skill variety to be associated with the needs for autonomy and competence. Given that they are both knowledge characteristics, we would expect job complexity and skill variety to have similar effects on BPN. We, therefore, use these findings as a basis for our assertion that job complexity will also be linked to outcomes via autonomy and competence:

> H1: The effects of job complexity on emotional exhaustion will be mediated by both BPN satisfaction and thwarting. Specifically, in weeks with more job complexity, the indirect effect via autonomy satisfaction (1a) and competence satisfaction (1b) on emotional exhaustion will be negative, whereas the indirect effect via autonomy thwarting (1c) and competence thwarting (1d) on emotional exhaustion will be positive.
>
> H2: The effects of job complexity on job satisfaction will be mediated by both BPN satisfaction and thwarting. Specifically, in weeks with more job complexity, the indirect effect via autonomy satisfaction (2a) and competence satisfaction (2b) on job satisfaction will be positive, whereas the indirect effect via autonomy thwarting (2c) and competence thwarting (2d) on job satisfaction will be negative.

Another, more commonly researched challenge demand is time pressure. For example, Widmer et al. (2012) studied the effects of time pressure on both positive and negative well-being. Similarly, Schmitt et al. (2015) found a curvilinear effect of time pressure on work engagement, showing that high time pressure is positively related to work engagement up to a point, before decreasing passed a certain point. On an intra-individual level, Ohly and Fritz (2010) established time pressure's ability to lead to positive outcomes. The abovementioned study by Prem et al. (2018) reported on the multilevel effects of time pressure on strain and motivation. Similarly, Kronenwett and Rigotti (2019) studied the effects of time pressure on work

engagement and emotional exhaustion at the within-person level and found an association between time pressure and increased work engagement mediated by task-related achievements when there was a low amount of unnecessary tasks. Time pressure should in theory be related to the satisfaction and thwarting of BPN as well. However, the literature contains little research on this subject to date. A construct related to time pressure, workload, has been linked to worker well-being at the within-person level (e.g., Albrecht, 2015; Bartholomew et al., 2014). Additionally, workload has been linked to worker well-being via needs for autonomy and competence (Gieter et al., 2018). The authors argue, "the need for relatedness plays a more distal role in the elicitation of employees' motivation" (p. 363) and that the needs for autonomy and competence have played a much more vital role in stress and motivational theories. Time pressure may, for example, reduce a worker's autonomy by stripping away the ability to decide when and how to do a job. On the other hand, the abovementioned studies linked increased time pressure to beneficial outcomes as well. It may, therefore, be possible that successfully completing a job under pressure provides an opportunity to demonstrate competence and satisfy the need to successfully manipulate one's environment. In our study, we test if time pressure affects worker outcomes via needs for autonomy and competence, in line with van den Broeck et al. (2016) and Gieter et al. (2018). We, therefore, propose the following hypotheses regarding how BPN satisfaction and thwarting mediates challenge demands and worker outcomes at the within-person level:

> H3: The effects of time pressure on emotional exhaustion will be mediated by both BPN satisfaction and thwarting. Specifically, in weeks with more time pressure, the indirect effect via autonomy satisfaction (3a) and competence satisfaction (3b) on emotional exhaustion will be negative, whereas the indirect effect via autonomy thwarting (3c) and competence thwarting (3d) on emotional exhaustion will be positive.

H4: The effects of time pressure on job satisfaction will be mediated by both BPN satisfaction and thwarting. Specifically, in weeks with more time pressure, the indirect effect via autonomy satisfaction (4a) and competence satisfaction (4b) on job satisfaction will be positive, whereas the indirect effect via autonomy thwarting (4c) and competence thwarting (4d) on job satisfaction will be negative.

### *2.3.3. Method*

#### *2.3.3.1. Participants and procedures*

This study is based on a heterogeneous sample of 308 observations collected in weekly surveys over 4 weeks in Germany from 84 employees (67% female; 72% working full-time; 86% had higher education or vocational training; mean age = 37.25 years, *SD* = 13.67; mean working experience in years = 13.93, *SD* = 13.00). We recruited participants by reaching out to contacts in organizations directly and asking HR professionals to distribute the sign-up link to their colleagues. Participants received a one-time demographic survey, in which they were informed about their rights as participants, assured anonymity, and informed that participation was voluntary. Upon completing this demographic survey, participants received another survey including all time-varying variables of interest on Thursdays or Fridays for 4 consecutive weeks. We excluded participants who did not work at least 20 hours per week and who did not partake in at least 3 weeks of data collection.

#### *2.3.3.2.Measures*

*Job complexity* was assessed using three items of the German version of the Work Design Questionnaire (WDQ; (Stegmann et al., 2010). The WDQ assesses several characteristics of work, such as task characteristics, knowledge characteristics, social characteristics, and work context (Morgeson & Humphrey, 2006). Job complexity is conceptualized as one facet of knowledge characteristics, usually assessed using four items (e.g., “The job comprises

relatively uncomplicated tasks “reverse scored). We measured each item on a scale from 1 (*disagree completely*) to 6 (*agree completely*). However, reliability analyses showed that one item (“The job requires that I do one task or activity at a time,” reverse scored) did not fit the scale well. A principal component analysis confirmed that this item loaded poorly onto a job complexity factor and therefore it was dropped.

*Time pressure* was assessed using the Instrument for Stress-related Activity Analysis (ISTA; Semmer et al., 1999). The ISTA was developed in German and contains five items related to time pressure that were adapted to fit a weekly study (e.g., “How often did you have to work faster in order to accomplish your work this week?”). The scale ranged from 1 (*very rarely/never*) to 5 (*very often*).

*Basic need satisfaction and thwarting* was assessed by adapting and translating the Basic Psychological Needs Satisfaction and Frustration Scale – Work Domain developed by Chen et al. (2015) and Schultz et al. (2015). The scale contains 24 items assessing need satisfaction and need thwarting of all three BPNs (autonomy, competence, and relatedness) in a work context. We adapted the instructions to reflect the weekly nature of our study and back translated the items from English to German using native speakers (e.g., “At work, I feel a sense of choice and freedom in the things I undertake”). Answers were given on a 7-point Likert scale ranging from 1 (*do not agree at all*) to 7 (*absolutely agree*).

*Emotional exhaustion* was assessed using three items of the emotional exhaustion facet of the Maslach Burnout Inventory-German Version (MBI-D; Büssig & Perrar, 1992; e.g. “I felt emotionally exhausted because of work”). The scale ranged from 1 (*never*) to 6 (*always*), and the instructions to the participant were adapted to fit a weekly observation.

*Job satisfaction* was assessed with three items of the job satisfaction subscale of the German version of the Copenhagen Psychosocial Questionnaire (COPSOQ; Nübling, 2005). Again, the instructions to the participant were slightly adapted for weekly assessment (e.g., “All in all, I was very satisfied with my job”).

#### *2.3.3.3. Data analyses*

Before assessing our hypothesized mediation models, we conducted several preliminary analyses. To check for factorial independence, we conducted a series of multilevel confirmatory factor analyses. Models in which the measures were differentiated showed adequate to good fit and outperformed the mis-specified models: two challenge demands ($\chi^2$ = 68.56, df = 38, p < .01, CFI = .96, TLI = .93, RMSEA = .05), four facets of BPN ($\chi^2$ = 408.80, df = 196, p < .01, CFI = .83, TLI = .80, RMSEA = .06), and the two dependent variables ($\chi^2$ = 23.32, df = 16, p = .11, CFI = .99, TLI = ..97, RMSEA = .04). Table 12 contains the means, standard deviations, composite reliability (CR), intraclass correlations coefficients (ICC), and zero-order correlations at both levels of analysis. Our complex data structure contained time points nested in individuals. The ICC showed that there were substantial proportions of within-person-level variance in the dependent variables (35% for emotional exhaustion and 33% for job satisfaction). Consequently, the ICC justifies the use of multilevel path analysis, as there is considerable variance on both levels of analysis. We, therefore, used multilevel path analysis in Mplus version 7.3 to test the proposed mediation models (Preacher et al., 2010). According to the authors, multilevel path models have several advantages over simple regression analysis. For one, the simultaneous modeling of the need-satisfying and need-thwarting paths allowed us to correlate the mediators, which improved overall model fit. Second, and more importantly, for our hypotheses, multilevel path analysis allowed us to separate within-person and between-person variance components. Therefore, multilevel path analyses are less prone to bias than other techniques that ignore the nested structure of the data.

Table 12 - *Multilevel correlations*

| | | M/ SD | CR/ ICC | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Emotional Exhaustion | 2.92<br>1.23 | .92<br>.65 | -- | -.36** | -.29* | -.15° | .89** | .42** | -.05 | .53** |
| 2 | Job Satisfaction | 4.69<br>1.02 | .86<br>.67 | -.17** | -- | .51** | .28** | -.65** | -.18* | .33** | -.18* |
| 3 | Need Satisfaction Autonomy | 4.74<br>1.04 | .74<br>.75 | -.10* | .07* | -- | .32** | -.51** | -.24** | .33** | .01 |
| 4 | Need Satisfaction Competence | 5.57<br>.77 | .78<br>.58 | -.11** | .08** | .09** | -- | -.33** | -.34** | .18** | .03 |
| 5 | Need Thwarting Autonomy | 3.62<br>1.32 | .84<br>.76 | .22** | -.13** | -.10* | -.05* | -- | .58** | -.10 | .62** |
| 6 | Need Thwarting Competence | 2.17<br>1.01 | .86<br>.64 | .09* | -.10** | -.08* | -.13** | .07* | -- | -.08 | .19* |
| 7 | Job Complexity | 4.70<br>.99 | .69<br>.64 | .06 | .02 | -.01 | .05° | .06° | -04 | -- | .18* |
| 8 | Time Presse | 2.99<br>1.02 | .93<br>.71 | .12** | -.01 | -.03° | .10** | .10** | .04 | .11** | -- |

Note: *Lower diagonal denotes within-level correlations, while the upper diagonal denotes the between-level correlations; ** p < .01, * p < .05, ° p < .10; M = mean, SD = standard deviation, CR = composite reliability, ICC = intraclass correlation coefficient*

Furthermore, in mediation analysis, the product of path coefficients (i.e., the distribution of indirect effects) is rarely normally distributed and has to be tested for significance using a distribution-free method (MacKinnon et al., 2002; Preacher & Hayes, 2008). Zyphur and Oswald (2012) recommend Bayesian analysis because it produces probability distributions of each parameter given the data, which can overcome deficiencies of frequentist point estimates (Kruschke et al., 2012). To obtain unbiased Bayesian credibility intervals (CIs), we used Bayesian estimators with noninformative Mplus default prior distributions and means. To test the proposed hypotheses, we estimated a model with job complexity and time pressure as independent variables, need satisfaction of autonomy and competence, and need thwarting of autonomy and competence as mediators. Figure 5 graphically depicts the estimated model. Direct effects from the independent to dependent variables and correlations, which were part of the statistical model, have been omitted to ease the legibility of the figure. The mediators were allowed to correlate with each other, while job complexity and time pressure were allowed to correlate at the intra-individual level. The independent variables were person-mean centered at the within level.

### *2.3.4. Results*

In the following section, we will first outline the Bayesian model results as described by Depaoli and van de Schoot (2017) before hypothesis testing the proposed mediations.

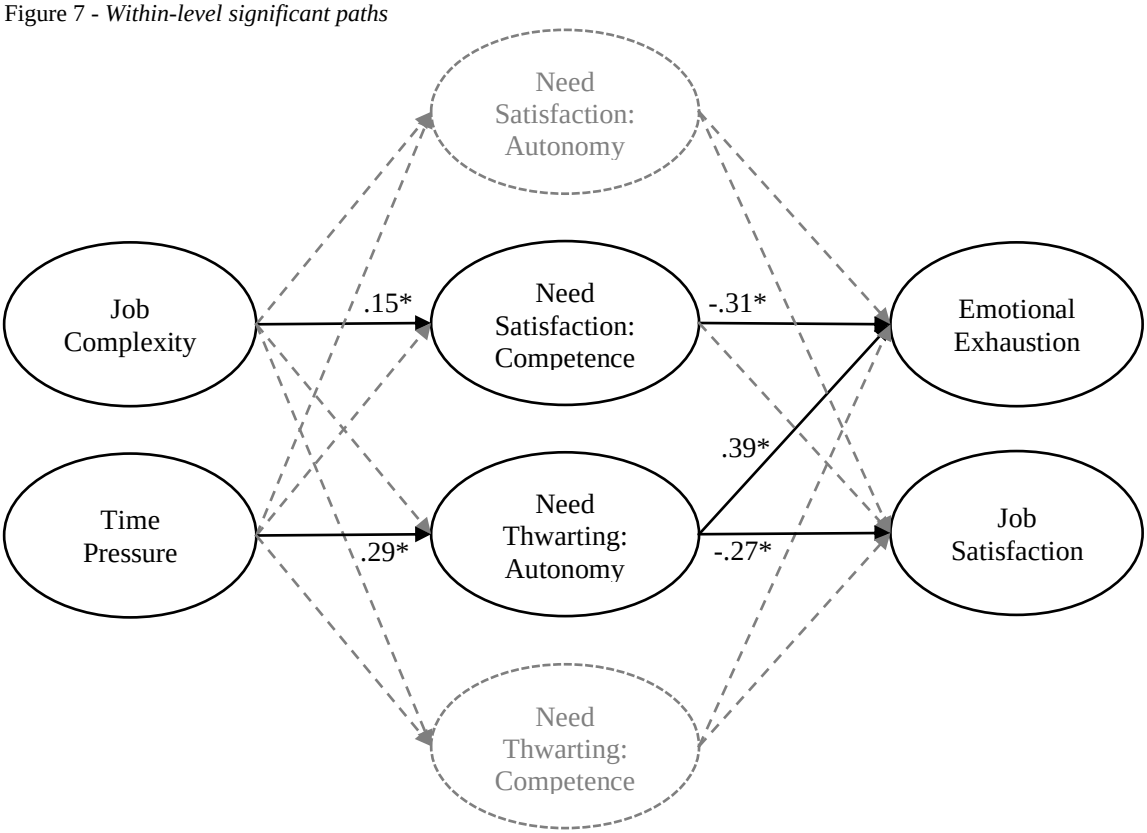
#### *2.3.4.1. Bayesian model fit results*

When assessing convergence, several factors must be considered. First, we visually inspected the Bayesian posterior parameter trace plots for convergence for the model. No issues were detected, as the horizontal middle and height of the chains had stabilized. We further used the potential scale reduction factor (Gelman & Rubin, 1992) as a convergence diagnostic tool, which also confirmed convergence, as it dropped below 1.05 after only 400 iterations. To avoid local convergence, we doubled the number of iterations from 10,000 to 20,000 and checked the abovementioned convergence diagnostic tools again. After doubling the number of iterations, no local convergence issues were detected. Upon inspecting the posterior distribution histograms for smoothness, no issues were detected. Similarly, posterior distribution kernel density plots roughly showed the expected shapes. To detect potential model misspecification, we examined the autocorrelation plots for the estimated parameters. Again, no issues were found. Overall, the model showed a good fit with a posterior predictive p-value of .40 and Bayesian posterior predictive checking using chi square [95% CI = -33.51, 41.66].

#### *2.3.4.2. Path analyses*

The zero-order correlations shown in Table 12 reveal significant relationships between the independent, mediator, and dependent variables at both the intra- and inter-individual levels. Interestingly, some of these relationships seem to differ depending on the level of analysis, for example, time pressure was correlated with thwarting the need for competence (.19, $p < .05$) at the between-person level but not at the within-person level, further underscoring the need for research considering various levels of analysis. Table II shows the indirect effects and their associated 95% Bayesian CIs at the within-person-level. Figure 6 graphically depicts the specific mediation paths of our model.

Figure 7 - *Within-level significant paths*




Note: *Direct paths omitted and non-significant paths in gray for clarity*

Hypothesis 1 stated that the effects of job complexity on emotional exhaustion would be mediated via BPN satisfaction and thwarting. This hypothesis needs to be partially rejected, as there was no total indirect effect found. There was, however, a significant negative indirect effect from job complexity via need for competence satisfaction on emotional exhaustion (-.05 [CI = -.10, -.01]).

Hypothesis 2 stated that in weeks with more job complexity, job satisfaction would be positively/negatively related via BPN satisfaction/thwarting. This hypothesis needs to be rejected, as there were neither total indirect effects nor specific indirect effects found.

Hypothesis 3 stated that in weeks with more time pressure, emotional exhaustion would be negatively/positively related via BPN thwarting/satisfaction. This hypothesis can be partially confirmed, as there were significant total indirect effects (.15 [CI = .06, .25]) as well as a specific positive indirect effect via autonomy thwarting on emotional exhaustion (.11 [CI = .04, .19]).

Hypothesis 4 stated that in weeks with more time pressure, job satisfaction would be positively/negatively related via BPN satisfaction/thwarting. This hypothesis can be partially accepted, as there was a significant negative total indirect effect for job satisfaction (-.12 [CI = -.20, -.05]) specifically via autonomy thwarting (-.08 [CI = -.14, -.03]).

Table 13 - *Unstandardized path coefficients (γ's) and 95% credibility intervals*

| H | Indirect Paths | γ | 95% CI |
|---|---|---|---|
| 1 | Total Indirect Effect: Job Complexity → Emotional Exhaustion | -.02 | [-.12, .07] |
| | Total Effect: Job Complexity → Emotional Exhaustion | .06 | [-.11, .23] |
| | Direct Effect: Job Complexity → Emotional Exhaustion | .08 | [-.07, .24] |
| 1a | JC → Autonomy Satisfaction → Emotional Exhaustion | .00 | [-.02, .02] |
| **1b** | **JC → Competence Satisfaction → Emotional Exhaustion** | **-.05** | **[-.10, -.01]** |
| 1c | JC→ Autonomy Thwarting → Emotional Exhaustion | .03 | [-.28, .09] |
| 1d | JC → Competence Thwarting → Emotional Exhaustion | -.01 | [-.04, .02] |
| 2 | Total Indirect Effect: Job Complexity → Job Satisfaction | .03 | [-.05, .10] |
| | Total Effect: Job Complexity → Job Satisfaction | .09 | [-.05, .23] |
| | Direct Effect: Job Complexity → Job Satisfaction | .06 | [-.07, .20] |
| 2a | JC → Autonomy Satisfaction → Job Satisfaction | .00 | [-.02, .02] |
| 2b | JC → Competence Satisfaction → Job Satisfaction | .02 | [-.01, .06] |
| 2c | JC → Autonomy Thwarting → Job Satisfaction | -.02 | [-.07, .02] |
| 2d | JC → Competence Thwarting → Job Satisfaction | .02 | [-.01, .06] |
| **3** | **Total Indirect Effect: Time Pressure → Emotional Exhaustion** | **.15** | **[.06, .25]** |
| | **Total Effect: Time Pressure → Emotional Exhaustion** | **.37** | **[.19, .56]** |
| | **Direct Effect: Time Pressure → Emotional Exhaustion** | **.22** | **[.05, .38]** |
| 3a | TP → Autonomy Satisfaction → Emotional Exhaustion | .01 | [-.01, .04] |
| 3b | TP → Competence Satisfaction → Emotional Exhaustion | .02 | [-.02, .07] |
| **3c** | **TP→ Autonomy Thwarting → Emotional Exhaustion** | **.11** | **[.04, .19]** |
| 3d | TP → Competence Thwarting → Emotional Exhaustion | .01 | [-.02, .05] |
| **4** | **Total Indirect Effect: Time Pressure → Job Satisfaction** | **-.12** | **[-.20, -.05]** |
| | Total Effect: Time Pressure → Job Satisfaction | -.07 | [-.21, .09] |
| | Direct Effect: Time Pressure → Job Satisfaction | .06 | [-.08, .20] |
| 4a | TP → Autonomy Satisfaction → Job Satisfaction | -.01 | [-.04, .01] |
| 4b | TP → Competence Satisfaction → Job Satisfaction | -.01 | [-.04, .01] |
| **4c** | **TP → Autonomy Thwarting → Job Satisfaction** | **-.08** | **[-.14, -.03]** |
| 4d | TP→ Competence Thwarting → Job Satisfaction | -.02 | [-.06, .01] |

#### *2.3.4.3. Additional Analyses*

Since both independent variables correlated weakly, it is possible to have suppressor effects when including job complexity and time pressure in the same model. To check for suppressor effects, we conducted additional analyses estimating separate models for job complexity and time pressure. For time pressure, the specific indirect effects, total indirect effects, and total effects remained the same as they did in the model containing both independent variables. However, when estimating the effects of job complexity on their own, different specific indirect effects were significant. Specifically, job complexity had a significant total effect on emotional exhaustion (.17 [CI = .00, .35]) and specific indirect effects via thwarting the need for autonomy to emotional exhaustion (.07 [CI = .01, .14]) and job satisfaction (-.04 [CI = -.09, -.01]).

### *2.3.5. Discussion*

Multilevel mediation analyses revealed that satisfaction and thwarting of BPNs for competence and autonomy to some extent mediated the links between job complexity and time pressure with emotional exhaustion and job satisfaction. However, the proposed ambivalent effects were not found. Instead, we found significant indirect effects from (a) job complexity via need for competence satisfaction to job satisfaction and (b) time pressure via need for autonomy thwarting to job satisfaction and emotional exhaustion.

#### *2.3.5.1. Theoretical implications*

Our proposed model that challenge-demands achieve their ambivalent effects by engaging both need satisfaction and need thwarting could not be confirmed in its entirety. Specific indirect effects showed that job complexity only involved one dimension of need satisfaction, whereas time pressure seemed to only involve one aspect of need thwarting. Neither challenge demand showed specific indirect effects to both positive and negative outcomes via both satisfaction and thwarting of BPNs. (Gillet et al., 2015) did find ambivalent paths via both need satisfaction and need thwarting. Their paper, however, did so in two separate studies. When including both possible mediating paths into the same model, we could not confirm the proposed parallel

mediation. When not controlling for time pressure, job complexity exhibited effects one would expect from a hindrance stressor. Only in a model controlling for time pressure does job complexity show effects that are beneficial to well-being (i.e., lead to lower emotional exhaustion via satisfying the need for competence). Widmer et al. (2012) also reported that challenge stressors in their study were able to positively affect well-being only when strain had been controlled. Bakker and Demerouti (2007) described in their review that the salience of job resources was increased in the presence of job demands. This posits an interesting question to future research, whether the salience and beneficial effects of challenge stressors depend on the presence of other challenges and/or resources, as Hobfoll (1989) conservation of resources theory would suggest.

Another plausible reason no ambivalent effects were found could be the a priori categorization of challenge stressors. Such a classification has been criticized because it neglects the stress appraisal process (Searle & Auton, 2015; Webster et al., 2011). Recently, a meta-analysis by Mazzola and Disselhorst (2019) also called the challenge-hindrance framework into question, as the number of negative outcomes of challenge demands outweighed positive findings in their analysis. Therefore, while it was the goal of our study to connect inherently challenging aspects of job complexity and time pressure, perhaps such effects still depend, at least in part, on the appraisal process. The results of this study may also call the a priori categorization of stressors into question.

Despite not being able to find ambivalent effects of job complexity and time pressure as challenge stressors, this study did provide some evidence for BPN satisfaction and thwarting as mediators in the motivational and strain paths of the JD-R model. In this study, thwarting the need for autonomy served as the mechanism by which negative effects of higher weekly time pressure increased emotional exhaustion and decreased job satisfaction. Conversely, need for competence satisfaction mediated higher levels of weekly job complexity and decreased emotional exhaustion. In other words, time pressure exhibited effects one could attribute to

regular (hindrance) demands, whereas job complexity resembled characteristics of a job resource. This could be a sign that BPN satisfaction and thwarting may function as mechanisms behind the *typical* JD-R model, where resources lead to need satisfaction and demands to need thwarting. van den Broeck et al. (2008) had first proposed STD (specifically need satisfaction) to be the mechanism by which job demands and resources affect employee well-being. However, our results may indicate that need thwarting is not simply the lack of need satisfaction. Schaufeli and Taris (2014) had evoked the notion that job resources affect well-being through satisfaction of BPN. Our study may lend support to the notion that need satisfaction and need thwarting may be separate processes underlying the motivational path and the strain path of the JD-R model. In the future, it may be interesting to investigate need satisfaction as the process for the motivational path and need thwarting as the process for the strain path using typical job resources and stressors.

#### *2.3.5.2. Practical implications*

Practitioners can learn from this study regarding the design of job characteristics in the motivation/burnout process. Specifically, weekly deviations in job complexity showed deteriorating effects on emotional exhaustion by satisfying the need for competence. By designing workplaces that include knowledge characteristics, allowing employees to satisfy their need to successfully interact with their work environment, organizations may increase worker well-being. Conversely, if workplaces result in too much time pressure, employees may lose their ability to decide on their actions and interact with their environment effectively, which may result in basic need thwarting and thus in increased exhaustion and decreased job satisfaction.

#### *2.3.5.3. Limitations*

Foremost, we would like to discuss the limitations our sample has placed on this study. We have collected a heterogeneous sample from organizations in the local area. The authors enlisted the help of graduate students to contact officials in organizations and invite them to distribute

the sign-up link within their organization. The sample is, therefore, more vulnerable to selection bias and sampling error than probability samples.

Furthermore, we would also like to caution the reader about the inferences of mediation and causal inference. While the analysis in our study is longitudinal, it is still correlational and without modeling latent change or autoregressive effects. In the future, more research is needed to understand how challenge stressors and need satisfaction/thwarting influence the change in job satisfaction and emotional exhaustion over time.

#### *2.3.5.4. Conclusions*

We could not find the hypothesized ambivalent effects of challenge demands. Instead, the two studied challenge demands had distinct capabilities to either satisfy BPN or thwart them. From the perspective of satisfying and thwarting BPNs, this study did not find justification to apply the categories of challenge stressors to the studied job characteristics of job complexity and time pressure. However, need satisfaction and need thwarting did function as processes by which demands may lead to strain and resources may lead to motivation/well-being.

# 3. General discussion

## 3.1. General Summary of Empirical Results

Each of the three studies in this dissertation investigated a role that resources can play in the wellbeing process at work. Perceived changes in resources have been found to have direct effects in mental and physical health after job changes. A personal resource has been shown to be implicated in the type of job crafting employees may engage in to gain further resources and remain engaged at work. And thirdly, satisfying and thwarting basic psychological needs has been shown to perhaps be a mediating process through which stressors, such as time pressure and job complexity, could affect worker wellbeing. In the following sections, I will further discuss the theoretical implications of the empirical results for COR, SDT, and Regulatory Focus Theory, as well as engage in a broader discussion on how these results could inform our understanding of demands and resources more generally.

## 3.2. Contributions to COR

The three papers that make up this dissertation could affirm the core tenet of COR, which states that psychological and physical wellbeing depends on individuals being able to accrue, protect, and invest resources in order to deal with stressors (Hobfoll et al., 2018). In all three studies was the loss of resources related to hedonic, eudemonic, and physical wellbeing, i.e., associated with lower levels of mental and physical wellbeing, work engagement, job satisfaction, or increased emotional exhaustion.

### *3.2.1. Basic tenet of COR*

The reprinted manuscripts each investigated a different role that resources can play in the worker wellbeing process. Study 1 showed that the loss of resources was associated with diminished mental health, study 2 found that (1) personal resources can influence the amount of resource generation through job crafting and (2) displaying fewer types of job crafting was associated with lower work engagement in study 2, and study 3 found that thwarting the need for autonomy had detrimental impacts on job satisfaction and emotional exhaustion. These results are in line with several other papers that confirmed that basic tenet of COR. For example

Sonnentag et al. (2010) showed that loss of resources hindered workers' ability to recover on the weekends and were in turn less likely to perform the next work week. Leadership research has also shown that diminished resources in managers lead to poorer leadership behaviors (Byrne et al., 2014; F. Yang et al., 2020). Similarly, a meta-analysis using COR as a framework has shown that lack of job control (i.e., autonomy, decision latitude, decision authority, skill discretion, etc.) was associated with burnout (H. Park et al., 2014). The studies in this dissertation could be said to have provided further evidence for the basic tenet of COR and that the acquisition and maintenance of resources, as well as the guarding from loss of resources play a central role in worker wellbeing.

### *3.2.2. The Four Principles of COR*

Several authors have noted the relatively stronger impact of resource loss on wellbeing (Baumeister et al., 2001; Wells et al., 1999). Studies 1 and 3 further probed the verity of the primacy of resource loss principle, as the loss of resources in Study 1 weighed more detrimental in diminishing mental health than the gain of resources offset such effects. Similarly, thwarting the need for autonomy in Study 3 had detrimental effects on job satisfaction and exhaustion, while satisfying the need for competence only reduced the amount of emotional exhaustion. This asymmetry may underscore the primacy of resource loss as well. These results further underscore the importance of protecting from resource loss, which could be achieved through resource investment.

The resource investment principle of COR posits that an initial loss of resources can be beneficial if these resources are "spent" to gain other resources. A review by Halbesleben and Buckley (2004) and a study by Halbesleben and Bowler (2007) report evidence that even after resources had been depleted due to burnout, employees could strategically help out other coworkers (i.e., invest in social support) in order to gain future personal returns from those coworkers. Similarly, Vander Elst et al. (2016) found that financial resources buffered the effects of job insecurity on mental and physical health complaints in a multi-level moderated

mediation model. Both Studies 1 and 2 found support for this principle. In Study 1, participants could be said to have invested workload and a predictable work schedule, while in Study 2, participants invested their PsyCap into a more fruitful job crafting strategy. While J. Y. Lee and Lee (2018) propose that personal resources (specifically PsyCap) could be "a catalyst for triggering job crafting behaviors" (p.26), this study was one of the first to find such an effect, especially regarding the utilization of a person-centric approach.

The gain paradox principle stipulates that resource gains are particularly salient in conditions of resource loss. As Study 3 has shown, while not able to outweigh the negative effects of resource loss (i.e., need thwarting), job complexity was associated with lower weekly levels of emotional exhaustion via satisfaction of the need for competence. While often considered a job demand, such resource-like effects of job complexity satisfying the need for competence serve as an example of the gain paradox principle, as the need thwarting aspects of time pressure increased the salience of the beneficial aspects of job complexity. This resource-like behavior of this job demand will be further discussed later in this section. These results are in line with more recent work by van Woerkom et al. (2016), who have reported a three-way interaction between two job demands (workload and emotional demands) and strengths use support. According to the authors, strengths use was particularly helpful in the high workload and high emotional demands condition. Similarly, Brunner et al. (2019) reported that in their study, when facing a high amount of stressors, individuals low in resources would benefit disproportionally more from a gain in resources. The intricate interplay between demands and resources has also been shown in a literature review on innovative behavior at work (Kwon & Kim, 2020). The authors therefore propose the inclusion of such interactions between conflicting conditions in frameworks and theories going forward. Nonetheless, it is noteworthy that job complexity via satisfying the need for competence was associated with lower emotional exhaustion – thereby contributing interesting insights into the "nature" of job complexity and its potential beneficial effects in the face of otherwise resource draining circumstances.

The desperation principle posits that when faced with low levels of resources, people applied maladaptive defensive strategies to stave off further losses. A review on resource seeking behavior in the workplace by Lim et al. (2020) surfaced examples of studies, in which evidence for the desperation principle may have been found. In a study of uncertainty and feedback-seeking behavior, for example, individuals that were very uncertain about their competence were said to have engaged in exaggerated feedback-seeking behaviors, compared to individuals with medium and low levels of uncertainty about their competence (Anseel & Lievens, 2007). Study 2 showed that lower levels of PsyCap were associated with belonging to the job crafting latent profile with the lowest levels of work engagement. In other words, while individuals who could "invest" their resources benefitted from adopting more beneficial job crafting styles, individuals who were already low on resources also adopted less effective job crafting.

#### *3.2.3. Caravans and Corollaries*

As study 1 showed, resources were commonly gained, remained the same, or were lost together. Only one of the four latent classes (the challenging latent class) did not show such a uniform gain or loss of resources. This may provide evidence that resources are seldom gained or lost alone, but that they band together and tend to travel in caravans.

Additionally, the job crafting profile with the highest number of personal resources in study 2 employed the most effective job crafting strategy and was associated with the highest levels of engagement. This may be an example of COR's corollary 1, which states that the starting point of resources will be integral in determining whether an individual with undergo resource gains or losses (Westman et al., 2005).

### 3.3. The "meaning" of resources

The studies in this dissertation found resources to have direct and mediating effects on worker outcomes, as well as being predictors for the acquisition of additional resources. This could confirm the basic tenet of COR and several principles and corollaries outlined previously. However, on a broader level, these results highlight the necessity for a more precise

understanding of the stress and wellbeing processes (similar to Edwards, 2008 critique of P-E-Fit theories). Papers 1 and 2 showed that in person-centric analyses, it is not just important to gain and keep a total amount of resources, but the "right kinds" need to increase employee well-being. In paper 1, gaining on all resources after the job transition did not lead to highest mental health levels. In paper 2, applying all four types of job crafting did not lead to the highest levels of work engagement. Instead, having the right gains and utilizing the right job crafting strategy to gain the needed resources seemed more important than simply doing more of it. While the idea of matching or congruent resources with environmental demands is not new (Parsons, 1909), COR does not explicitly consider "resource match" with the situation or the individual resource being lost when investing resources. Other theoretical considerations in related frameworks have proposed that in order to be maximally helpful, resources need to match their corresponding demands (Chrisopoulos et al., 2010; de Jonge et al., 2008; Tooren & Jonge, 2010). These authors propose a demands-induced strain compensation model (DISC; de Jonge et al., 2008), which supposes that demands can be grouped into cognitive, emotional, and physical categories – and that in order to stave of negative wellbeing outcomes, resources of the same kinds as the demands need to be available. Matching resources with types of demands has been shown to increase physical strength and vigor in semi-professional athletes (Balk et al., 2020) and has been examined experimentally as well (van den Tooren et al., 2012). However, as Crane (2021) points out, such a broad categorization may have two particular shortcomings. For one, this categorization may not capture miniscule nuances between demands and resources. For example, the spectrum of cognitive demands and resources may be broad. A pilot may face the cognitive demands of having to sustain concentration and having to make decisions. However, a supposedly matching cognitive resource like task-relevant knowledge may only facilitate decision making, but not alleviate the demands that sustained concentration put on the pilot. This classification may therefore fail to capture the nuances in this case. On the other hand, a resource such as self-efficacy (Bandura, 1978) has been meta-

analytically linked to many different aspects of coping, e.g., job performance (Sadri & Robertson, 1993; Stajkovic & Luthans, 1998) and burnout (Shoji et al., 2016). Similarly, Kulikowski (2020) proposed a conceptual model, wherein general cognitive ability has direct effects on job demands and job resources, while simultaneously moderating the effects of job demands in burnout. Such ubiquitous resources may be beneficial across many contexts and may not need to be matched.

So, the inclusion of a "matching principle" in any theory or framework seems complicated from the beginning. Additionally, opposite to earlier stimulus/response-type stress theories and the JD-R, COR does not explicitly conceive of demands, stressors, or noxious environments, like for example the DISC does. It therefore does not easily lend itself to a matching hypothesis, or the introduction of a "matching principle", as there is no opposing construct to easily match it to. However, as study 1 has shown, it may nonetheless be possible to compensate the loss of one resource with a different resource (e.g., a loss of scheduling flexibility could be compensated with a gain in income). Perhaps it is possible to improve resource investment by including a "resource gain-loss match" for COR, meaning that the loss of one kind of resource may be offset by gains in another matching resource. COR's proposition of resource caravans could propose possible candidates for such a resource match. Continuing the example by Adler and Newman (2002), since socio-economic status and income may form a caravan, a loss of socio-economic status may best be offset by income, as opposed to a non-matching resource that does not travel in the same caravan. Future research may investigate whether the salience and investment of resources are particularly strong for resources of a particular match in the COR framework.

Similarly, the results of study 3 may posit interesting questions from a COR perspective. While the JD-R posits that demands act as counterparts to resources, COR does not explicitly consider demands as important concepts in their own right. The COR perspective merely values demands indirectly in their potential to cause perceived or actual resource loss. From that perspective,

time pressure in and of itself would not be detrimental, but the loss of autonomy associated with increased time pressure would be. This opens a broader discussion of the nature of resources and demands. Are demands simply the lack of a resource? What differentiates a demand from a resource? Or is a distinction between demands and resources even necessary, despite some contradictory findings on the potential of so called challenge demands (LePine et al., 2005; Podsakoff et al., 2007) utilized in study 3. As Semmer and Zapf (2019) surmise, there may be curvilinear effects in which a demand does not become a stressor until a certain point is reached. Could this be true for resources as well that the loss of a resource may have non-linear effects? Nonetheless, there remains a large amount of overlap and grey area on the meanings of stressors, demands, and resources – which may hide some major conceptional issues as to what these phenomena are. As Bacharach (1989) notes, good theory first needs to clearly identify the phenomenon – yet, many modern conceptualizations of worker stress and wellbeing may fall short of that. It may be necessary to first gain a better understanding of the demands/resources-distinction before it is possible to gain better insights into the role that resources play in the work stress and wellbeing process. In a sense, this dissertation attempts to answer the *how* of theory (Edwards, 2008; Whetten, 1989), while there is no consensus by the competing work stress and wellbeing theories on *what* are the components all these theories propose (Dewe, 2017). While these questions of the existence of such phenomena remains beyond the scope of this dissertation, it may nonetheless become necessary to understand the taxonomy of those phenomena in the future. Only once the distinction (if there is any) between resources and demands has been clarified, can one better understand *how* resources affect worker wellbeing.

### 3.4. Integrating Self-Determination Theory

As the preceding section highlighted, the distinction between demands and resources is not always clear. For example, as Bakker and Sanz-Vergel (2013) showed, workload and cognitive demands had mixed effects on worker wellbeing. From a COR perspective, time pressure and job complexity could constitute a resource drain, as meta-analytic evidence shows a small but

significant negative relationship between time pressure and performance, i.e., accuracy and speed (Szalma et al., 2008). Therefore, the aim of study 3 was to delve into those intricacies by investigating job complexity and time pressure at work as two such ambiguous concepts, i.e. challenge demands (Crawford et al., 2010a; LePine et al., 2005). As the satisfaction of those basic needs has been shown to be linked to wellbeing, attitudes, and behavior at work (van den Broeck & van Beek, 2019), study 3 proposed that satisfying and thwarting the needs for autonomy, competence, and relatedness could be the resources through with challenging demands unfold their positive and negative effects on worker wellbeing. While study 3 did not find the proposed ambiguous effects, the results do have theoretical implications. For one, it highlighted the importance of including need thwarting as an opposing construct to need satisfaction. Secondly, it showed the resources (i.e., the basic psychological needs) could be the mechanism by which resources affect worker wellbeing. It may therefore be necessary to expand process theories like the JD-R and COR to explicitly include elements of content theories, specifically the satisfaction and thwarting of BPN between the demands/resources and outcomes.

### 3.5. Regulatory Focus Theory

Another theoretical integration of this dissertation was that of regulatory focus theory (Higgins, 1997) and several principles of COR (e.g., resource investment and desperation). Regulatory focus proposes that individuals engage in one of two approaches when faced with adversity: They may either chose a proactive approach strategy or may attempt to avoid a challenge. There is meta-analytic evidence that promotion focus can have positive effects on work outcomes (Gorman et al., 2012). Beyond direct effects, prior research has shown the importance of regulatory focus as a moderator in the stressor-strain relationship. Brenninkmeijer et al. (2010) have found that individuals with a prevention focus were more vulnerable to the damaging effects of job demands. Interestingly, participants with a high promotion focus benefitted less from job resources than those with low promotion focus, perhaps lending further evidence for

the primacy of resource loss principle from a COR perspective. Similarly, Kuntz et al. (2017) investigated three-way interactions between support and regulatory focus, using COR as theoretical underpinning to investigate resource investment in the context of regulatory focus. The authors report that two-way interaction results indicated that regulatory focus buffered against the effects of low resource availability. Interestingly, in individuals with an elevated level of prevention focus and a low level of promotion focus, receiving elevated levels of supervisor support led to lower levels of employee resilience. Lacking a promotion focus may have led to the adoption of maladaptive coping by perceiving supervisor feedback as a stressor, instead of a resource, possibly indicating the desperation principle.

Study 2 build directly upon research by Mäkikangas (2018) on how regulatory focus in job crafting relates to eudemonic work outcomes. Contrary to our expectations, homogeneous subgroups of job crafting strategies did not fall into the approach/avoidance dichotomy proposed by regulatory focus theory. Instead, the subgroups could all be described as differently approach-focused instead. From a COR perspective, these results would suggest that resource investment is an inherently proactive activity and that if there was a dichotomy, it may fall along the lines of crafting and not-crafting, rather than crafting proactively or avoidantly. Nonetheless, the results highlight the importance of nuance even with such established theories such as Regulatory Focus Theory. While many previous studies have upheld the approach-avoidance dichotomy, one must question the applicability in the context of resource investment through job crafting.

### 3.6. Challenge Hindrance Framework

The first study surfaced a latent class of job changers who reported a worsening in workload and working hours - yet who were able to maintain reasonable levels of mental and physical wellbeing (especially compared to the worsening latent class). In the second study, the latent profile which conducted job crafting by increasing job resources and increasing challenge demands was found to have the highest levels of work engagement (even higher than the profile

that focused on only increasing job resources). Study 3 showed that in weeks with more job complexity, through the satisfaction of the need for competence, participants experienced lower levels of emotional exhaustion. These studies imply that the basic COR principle of more resources equals better outcomes may not be quite as simple. Investing resources by taking on challenging demands (as opposed to spending resources on dealing with hindering demands) may pose as just as important as conserving and gaining resources. Similarly to Dutton et al.'s (2006) argument for Positive Organizational Psychology (i.e., the notion that the prevention of demands alone does not generate genuine wellbeing), Keyes (2002) suggests, the spectrum of mental wellbeing may not be a mere dyad of mental health and mental illness – or that the absence of mental health automatically constitutes mental illness. Instead, the author suggests a continuum ranging from mental health to mental illness, with a portion in between that is neither health nor illness (i.e., languishing). It may be that the conservation and mere gain of resources is the path to stave off mental illness, but that alone may not be enough to achieve mental health or flourishing. Perhaps also investing resources and overcoming challenging demands is what allows the next step along the continuum towards genuine health and flourishing. Future research should investigate if conservation, gain, and investment of resources to lead to different outcomes/stages on the mental wellbeing continuum.

### 3.7. Non-variable-centric approaches and within-person effects

Variable-centric and person-centric approaches differ in their purpose, analytical methods, and relative strengths (Howard & Hoffman, 2018). Two studies in this dissertation investigated the role resources can play not from the perspective of understanding the relationship between specific variables in a given population, but to determine if specific subgroups exist within a given population. These subgroups can be based on complex patterns of several variables, adding a richness that variable-centric analyses cannot achieve. It may therefore be a valuable contribution of this dissertation to have investigated, confirmed, and perhaps added new questions to COR, the JD-R, and Regulatory Focus Theory at this level of analysis – because

to understand and explain psychological phenomena, theories should be valid using either variable-centric or person-centric perspectives. Particularly regarding the often found dichotomy between proactive and avoidant regulatory focus from a variable-centric analysis (e.g., a meta-analysis by Y. Zhang et al., 2019) should perhaps be questioned further using person-centric analyses.

Additionally, unlike the above-mentioned person-centric perspective, Study 3 employed a variable-centric perspective, able to connect common associations amongst variables that summarize an entire population. However, by investigating the within-person level longitudinally, this dissertation heeds to the call for understanding the worker wellbeing process as it may play out within people, as opposed to the common comparison of effects between different individuals (Bakker & Demerouti, 2017).

### 3.8. Future research

The studies that make up this dissertation each investigated distinct roles that resources can play in the wellbeing process at work. Resources were found to have direct effects on outcomes, as the gain and loss of resources after job transitions influenced mental and physical wellbeing. The personal resource PsyCap was shown to have been involved in the acquisition of further resources through the process of job crafting and the satisfaction and thwarting of basic psychological needs has shown to mediate between demands and health outcomes. In short, resources have been found to play several important roles in the worker wellbeing and stress process. However, several theoretical and conceptual issues remain.

For one, it remains unclear whether the positive effects of resources arise from the resource itself, or if the gains and losses of resources are the underlying mechanism by which resources generate wellbeing. The distinction matters as far as several theories of stress, wellbeing, and motivation at work hinge upon that distinction. For example, in the JD-R, a resource such as PsyCap is conceived to have innate value/potential and can determine the outcomes inherently, i.e., the existence of a resource leads to higher motivation and wellbeing on the motivational

path of the JD-R, while the existence of a demands leads to strain (Bakker & Demerouti, 2007). It is not the gain or loss of said resource that determines the outcome, as COR would suggest (Hobfoll & Shirom, 2000). While the JD-R does attempt to incorporate the concept of resource acquisition through the later incorporation of job crafting (Bakker et al., 2014), it does so from the perspective that the existence of that gained resource determines the outcome – and not the change in relative resource levels, i.e., one now has one more resources and that is what determines the outcome. But which properties of resources are responsible for their affecting wellbeing? Perhaps that conundrum may need to be solved before questions such as "what role do resources play in the stress and wellbeing process?" can be more thoroughly answered. Experimental studies that can adjust and vary resources to simulate gains and losses may offer an avenue into understanding such principles. Additionally, further longitudinal investigations are needed that can capture gains and losses of resources over longer periods of time.

Secondly, the distinction between a demand and a resource remains unclear. Are demands the lack of or the loss of resources (as COR and Study 1 may suggest), do demands exist as antipoles to resources (as the JD-R may suggest), or is the distinction entirely moot and dependent on psychological processes such as appraisal (as Searle & Auton, 2015 suggest)? It may be a fool's errand to investigate the stress and wellbeing process without a clear understanding of the taxonomy and clear definition of the components being studied. If Schrödinger's Cat (1935) is simultaneously dead and alive, quantum physics may function just as well. However, if psychology cannot answer if demands and resources are two sides of the same coin or something else entirely, major theoretical and empirical work remains to be done. Never mind debating the usefulness of process theories versus content theories – or the role resources can play in these processes – when it is not even clear what components those processes are believed to be made of.

Thus, a third concern is born out of the conceptual issues highlighted above: Wellbeing, motivation, burnout, fatigue, job satisfaction, and all other possible phenomena workers can

experience at work are currently explained by several possible processes and theories in the literature (for a review, see Dewe et al., 2012). This dissertation, too, combines and borrows from several theories in the various papers and attempts to unify elements of said theories, for example combining Self-determination Theory (Ryan & Deci, 2000) and the JD-R (Bakker & Demerouti, 2007), or Regulatory Focus Theory (Higgins, 1997) and COR (Hobfoll, 1989). Alas, even taken all three papers of this dissertation together falls short of coherently unifying or simplifying the many theories. Conspicuously absent is a unified theory of worker wellbeing that can both explain the many psychological phenomena present in the workplace, as well as provide clear insights into the abovementioned questions about the true nature/relationship between concepts such as demands/stressors/resources. Just as physics may never discover a "theory of everything" (Hawking & Mlodinow, 2010), such a concept may be just as unattainable for psychology. However, in the realm of Occupational Health Psychology it may be possible for future researchers to develop a "theory of most things", which could be able to describe and predict work related health and wellbeing outcomes more accurately.

Regardless of the almost metaphysical issues described in the paragraphs above, the three studies taken together do contribute to our understanding of current stress theories and posit interesting new questions for the future. The JD-R clearly places resources as antecedents to a specific type of outcome, which seems a very limited role given the many possible roles investigated in this dissertation and by other researchers (e.g., Guthier et al., 2020) for a very different role than many models and stress theories suggest, where resources not only function as antecedents, but also moderate the reciprocal relationship between burnout and demands. If it is possible that a resource can be both the antecedent to a stress/motivational outcome and simultaneously moderate the effect that stress/motivational outcome has on the perception of other demands, then the JD-R and COR may be in need to major revision and updating with many more paths beyond the motivational path and the strain path (similar to how the JD-R has been extended to include challenge stressors; Lepine et al., 2005). COR already incorporates a

form of reciprocal relationship through its notion of gain and loss spirals – wherein the loss of resources leads to detrimental outcomes, which in turn lead to further loss of resources, and so on. Multi-year longitudinal observations are needed to fully capture several such cycles in order to fully understand the reciprocity between resources and wellbeing outcomes.

Perception may also be another key issue because of this dissertation. While the analyses conducted considered the changes within the person and took person-centric approaches, as opposed to variable-centric approaches, the actual cognition, perception, and appraisal of and by the individual was not given consideration. The theories relied upon in this dissertation prescribe a beneficial or malicious property to a construct, be it understood as a resource or a demand. However, the effect a phenomenon may have on an individual may be in large parts idiosyncratic and subjective, as several authors suggest (e.g., Gomes et al., 2013; Lazarus & Folkman, 1984; Lowe & Bennett, 2003; Searle & Auton, 2015). As the desperation principle of COR stipulates, individuals that are already low on resources will have a stronger reaction to resource loss than individuals high on resources (Hobfoll et al., 2018). But how does an individual know or judge that they are low on resources without an appraisal? This process is cognitive and future research should also consider appraisal processes such as primary and secondary appraisals (i.e., does the individual perceive said loss of resources as a challenge, hindrance, or a threat – and does the individual judge to have enough resources to cope?) when considering the COR perspective.

### 3.9. Practical implications

Practical implications of the individual studies have been discussed earlier. Taken together, all three studies highlight the importance of resources in maintaining wellbeing at work. Stressful and demanding situations are unavoidable. Some authors even suggest that never facing any challenges at work may be just as detrimental than facing too many challenges (for example, see work on the concept of languishing by Keyes (2002) or Parker (2014) on stimulating, yet tolerable work design). However, despite the minutia of whether employers should be

challenging their workers (Mazzola & Disselhorst, 2019), this dissertation showed that employers should not put employees in these kinds of stressful situations without the necessary resources to stave off adversity – or put workers in situations that leave them with a net negative of resources. When changes in jobs cannot be avoided, the changes in available resources should be monitored and eventual losses compensated with gains in other resources (i.e., resource substitution).

Authors have suggested that work can be designed by organizations to foster employees development, as well as their physical and mental health (Parker, 2014; Parker & Jorritsma, 2021). Work should therefore also allow workers to fulfill their basic needs for autonomy, competence, and relatedness, as these may be important mechanisms through with workers can deal with challenging job characteristics. Especially the context of "Work 4.0", "new ways of working", the "gig-economy", or "remote/hybrid office" warrants for organizations to pay close attention to workers' satisfaction and thwarting of the basic psychological needs for autonomy, competence, and relatedness. As a review by Gerdenitsch (2017) showed, work situations that allow for a great deal of flexibility in time and place offer both opportunities to satisfy and thwart basic psychological needs. The ability to work from anywhere and without physically meeting coworkers may, for example, be beneficial to worker wellbeing, as it allows for the satisfaction of the need for autonomy – but may simultaneously become a challenge to meet the need for relatedness. Organizations may need to find new ways to help workers meet their needs digitally/remotely. For example, social media platforms could be used to meet remote workers' need for relatedness and merit-based badges for gig-workers may allow them to feel more like workers that are contributing to a greater picture, thereby satisfying the need for competence (Jabagi et al., 2019).

The challenges outlined above describe how organizations can use top-down design to affect worker wellbeing. However, workers are not entirely dependent on job design to foster resources at work, but can also affect their resources through job crafting (Tims, 2019). Since

resources can play several roles in the process, it may be most effective to empower workers to gather/manage job and personal resources on their own through job crafting – instead of top-down job design that does not account for the individuals' unique needs. Job crafting interventions can allow workers to shape their resource environment at work to best suit their needs and have been shown to increase work engagement and produce a positive return on investment for organizations in a meta-analysis by Oprea et al. (2019). For example, Psychological Capital can allow workers to engage in the most engaging kind of proactive job crafting. Allowing workers to develop their personal resources can therefore be an added benefit, as it has also been shown to be linked to increased wellbeing, performance, and thriving at work, e.g., in meta-analyses by Kleine et al.; Lupșa et al. (2020). Future research should investigate if combining PsyCap interventions with job crafting interventions can boost the effects of each intervention – however, allowing either or both should have benefits for the individual and therefore also for the organization regardless.

### 3.10. Limitations

The strengths and limitations of individual studies have been addressed in each reprint. Nonetheless, an overarching limitation regarding the formulation of research aims and objects need to be addressed. As highlighted in the previous paragraphs, the research aims in this dissertation may have been formulated too broadly. Rather than investigating several distinct roles resources could play in the worker wellbeing process, an in-depth investigation with an increased focus on only one such role may yield deeper insights than the broader approach of this dissertation. For example, focusing only on the indirect effects from resources on worker wellbeing outcomes with all the studies in a dissertation would have the potential to gain a deeper understanding into the proposed processes – as opposed to only scratching the surface as this dissertation does by investigating basic psychological need satisfaction with only one study. However, by narrowly focusing on only one of many roles that resources could play one could miss the bigger picture. No dissertation can neither "go deep enough" to explain a narrow

process fully, nor can it be broad enough to describe the “bigger picture” in its entirety. It is my hope that his dissertation walks the fine line of sampling broad research just deep enough to provide a meaningful contribution to both in-depth understanding and broad understanding of the roles the resources can play in the worker wellbeing process.

Additionally, studying life-changing events like job changes unfortunately impedes more causally focused research designs, such as randomized controlled trials. None of the studies in this dissertation can (and should not) make causal claims regarding the effects that have been found. A varying use of samples and research designs may have been able to address such questions more robustly than the current designs in this dissertation.

Furthermore, all studies relied on subjective self-assessments of both resources and outcomes – introducing the possibility of “same source bias”. Lacking diverse sources or objective measures of outcomes (e.g., physiological indicators of stress, such as EEG, ECG, or cortisol) it is possible that the mental health status of the individual respondent may have influenced their perception of the stressors/resources.

## 3.11. Conclusion

Resources have been shown to play several crucial roles in the wellbeing process at work. Gaining resources may have direct effects on health outcomes and resources can be spent, i.e., invested, without leading to negative effects. In fact, investing resources to overcome challenges may even further boost hedonic, eudemonic, and physical wellbeing. Such effects are contrary to a simple binary understanding of the strain process, in which resource gain is associated with positive outcomes and resource loss with strain. The workplace wellbeing process may therefore be more complex than a "simple" gain/loss calculation, and resources play several roles in this complex process. Conservation of Resources Theory (Hobfoll, 1989) can be a useful theoretical framework through which to consider the role of resources – but it may need to be integrated with content theories such as Self-Determination Theory (Ryan & Deci, 2000) to better explain worker wellbeing phenomena. Person-centric approaches we able to confirm some tenets and corollaries of COR, which have previously been investigated with mostly variable-centric approaches – and within-person longitudinal research in this dissertation did so as well.

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# Appendix

## Overview of manuscripts

Giebe, C. & Rigotti, T. (2020). A Typological Approach of Resource Fluctuations after Job Transitions in a Representative Panel Study. *European Journal of Work and Organizational Psychology*. doi: https://doi.org/10.1080/1359432X.2020.1756261

Giebe, C. & Rigotti, T. (under review). The Role of Psychological Capital in Weekly Job Crafting Profiles and their Relation to Work Engagement: A Person-Oriented Study.

Giebe, C. & Rigotti, T. (2020). Tenets of Self-Determination Theory as a Mechanism Behind Challenge Demands: A Within-Person Study. *Journal of Managerial Psychology.* doi: https://doi.org/10.1108/JMP-11-2019-0648

## Overview of past advisors

"Explanatory Style and persistence in college student-athletes" – Advisor: Dr. Cynthia Prehar, Framingham State University

"Inclusive Leader Assessment" – Advisor: Dr. Ashita Goswami, Salem State University

"The role of resources in the employee well-being process: Person-oriented approaches and within-person effects." – Advisor: Prof. Dr. Thomas Rigotti, Johannes Gutenberg – Universität Mainz

**Course of higher education**

| **Bachelor of Arts in Applied Psychology**<br>*Framingham State University (GPA 3.84)* | **Master of Science I-O Psychology**<br>*Salem State University (GPA 3.89)* |
|---|---|
| Applied Organizational Theory & Management | Data Analysis for I-O Psychology |
| Behavioral Statistics | Directed Study: Qualitative Research |
| Bioethics | Group Facilitation in Organizations |
| Business and Professional Communication | Industrial and Organizational Psychology |
| Business Law I | Internship |
| Career Decision Making | Legal and Ethical Environment |
| Composition I+II | Management Theory and Applications |
| Conceptual Physics | Organizational Consulting |
| Cultural Anthropology | Personnel Selection and Placement |
| Defining Themes in US History | Principles of Psychological Testing |
| Elementary Chinese I | Research in Organizations |
| Empirical Research Thesis in Psychology | Social Psychology |
| Europe and World since ca. 1450 | Special Topics in Psychology |
| General Psychology | Training and Development |
| Group Communication | Work Motivation |
| Group Dynamics | |
| Health Psychology | |
| History and Systems of Psychology | |
| Human Biology | |
| Industrial and Organizational Psychology | |
| Information Systems for Business Management | |
| Introduction to Biology | |
| Introduction to Environmental Studies | |
| Introduction to Political and Social Philosophy | |
| Introduction to Theatre and Drama | |
| Neuropharmacology | |
| Personal Finance | |
| Physiological Psychology | |
| Principles of Macroeconomics | |
| Principles of Microeconomics | |
| Psychological Testing | |
| Psychology of Employee Training | |
| Psychology of Personality | |
| Psychology of Sexuality | |
| Psychology Research I: Methods | |
| Psychology Research II: Design | |
| Research Methods | |
| Sport Psychology | |
| Survey of Accounting | |

**Declaration regarding the doctoral examination procedures**

# ERKLÄRUNG

**Gemäß § 6 Absatz 2 f) der Promotionsordnung der Fachbereiche 02, 05, 06, 07, 09 und 10 von 04. April 2016**

Name (ggf. Geburtsname): Giebe

Vorname: Christopher

**Haben Sie sich bereits früher einem Promotionsverfahren unterzogen?**

x Nein

□ Ja

Wenn ja, an welcher Universität? ---

zu welchem Zeitpunkt? ---

und mit welchem Erfolg? ---

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x Nein

□ Ja

22.02.2022
Datum

**Declaration of authorship**

# ERKLÄRUNG

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