School of Management

Reorienting Job Crafting Research: Theoretical Clarification and Novel Investigations into Demands Crafting

Fangfang Zhang

This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University

December 2019

THESIS DECLARATION

I, Fangfang Zhang, certify that:

This thesis has been substantially accomplished during enrolment in the degree.

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

The work is not in any way a violation or infringement of any copyright, trademark patent, or other rights whatsoever of any person.

The research involving human data reported in this thesis was assessed and approved by the University of Western Australia Human Research Ethics Committee (RA/4/1/8542).

The work included in this thesis was supported by the Australian Government Research Training Program (RTP) Scholarship.

This thesis contains published work and/or work prepared for publication, some of which has been co-authored. Please refer to the “Authorship Declaration” for further details.

Name: Fangfang Zhang

Signature: Date: 18/12/2019

ABSTRACT

Although job crafting research is burgeoning in recent years, the literature on job crafting is fragmented due to different theoretical perspectives and measurements. The present thesis aims to provide theoretical clarification of job crafting construct and empirical investigations into demands crafting, wherein theoretical debate and inconsistent empirical findings exist. The first article provides a new three-level hierarchical structure of job crafting: job crafting orientation, whether job crafting is approach- or avoidance-oriented; job crafting form, whether job crafting is behavioural or cognitive; and job crafting content, whether crafting is targeted to job resources or job demands. With this new structure of job crafting, this article reviews and synthesizes antecedents and outcomes of job crafting in studies from both perspectives. Article 2 examines why employees engage in different strategies (i.e., reducing demands or optimizing demands) to craft job demands based on the transactional theory of stress. Results from a field study and two scenario-based experimental studies showed that challenge appraisal predicted optimizing demands indirectly via increased control appraisal, while hindrance appraisal predicted reducing demands directly irrespective of the feeling of control. In addition, job autonomy had a main effect on control appraisal but did not interact with challenge/hindrance appraisal to influence control appraisal. Article 3 addresses the inconsistent findings and theoretical debates on one specific type of job crafting: decreasing hindering job demands. Following Zhang and Parker's (2019) idea that the effect of decreasing hindering job demands depends on the extent employees engage in other approach-oriented crafting, this article applies a person-centred approach to investigate job crafting profiles. Latent profile analyses across two studies identified three types of job crafters: proactive, active and reactive crafters. The three profiles differ in their work engagement, task performance, and organizational citizenship behaviour, with proactive crafters showing the highest level of these outcomes, followed by active crafters and reactive crafters. Together, the present thesis contributes to theoretical clarification of job crafting

construct and a better understanding of demands crafting. The theoretical implications include integrating other theories into job crafting literature such as approach-avoidance motivation theory and transactional theory of stress, while practical implications include the need for organizations to take different types of job crafting into consideration in practice.

Keywords: job crafting, approach-avoidance motivation, cognitive appraisal, job autonomy, work engagement, task performance, person-centred approach

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

I should first express my thanks to my supervisor, Professor Sharon K. Parker. It is my great honour to have worked with her over the past (almost) four years. Her enthusiasm, passion, and dedication to research and impact on the broader community have continuously inspired me. I am glad that she communicated her expectations to PhD students with me at our first meeting, which provides clear guidance for me to do my PhD. I consider this expectation document as the bible of my PhD, which I have referred back a lot of times to check whether I am on track and what I can improve further. The process of a PhD is full of problems, questions, and uncertainty. Still, with Professor Sharon's guidance and support, I regard it a challenging and enjoyable journey. She is generous to give feedback not only to my research but also to my professional development, which I have benefited most from. She is a great role model for me to learn during my PhD and in my future academic career.

I would also like to thank other scholars who have influenced me during my PhD. One is my co-supervisor, Professor Zhijun Chen. Although we only worked together for one year due to his work transfer and my PhD transfer, I am very grateful for his ongoing suggestions on my research and career. I thank my co-author, Associate Professor Maria Tims for her generous sharing of the datasets, inspiring discussion, and feedback on the paper drafts. I would acknowledge colleagues and fellow PhD students at the Future of Work Institute for great research seminars, inspiring discussions, and collaborations.

I would also like to thank other people who have assisted in the completion of my PhD. I am very grateful for the help of Associate Professor Paul Alexander, the Director of Graduate Research Studies in the School of Management. He has been very supportive since my transfer to Curtin University. Every time I got a question and approached him for help, he is always there to help with a warm heart. I thank Ms. Abbe Rorrison and Ms. Sana Arslan for their support with communications and lots of paper works during the process of my PhD.

Finally, I thank my husband, Ding Wang, for encouraging me to do a PhD and the ongoing support during my PhD. It becomes more challenging to do a PhD with a baby as a first-time mother. Thanks to my husband for sharing the parenting responsibilities. To my Mom and Dad, I thank them for always supporting me on any decision I made.

AUTHORSHIP DECLARATION: CO-AUTHORED PUBLICATIONS

This thesis contains published work and/or work prepared for publication, some of which has been co-authored. The bibliographical details of the work published from this thesis are outlined below.

PUBLICATIONS DERIVED FROM THIS THESIS

Publications and Submissions

Zhang, F., Parker, S.K. (2019), Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour, 40,* 126-146.

Zhang, F., Parker, S.K. (2019), Reducing or optimizing demands? Effects of cognitive appraisal and autonomy on job crafting to change one's work demands. *Journal of Vocational Behaviour,* under review.

Zhang, F., Tims, M., Parker, S.K. When is decreasing hindering job demands positive? An analysis of job crafting profiles. Targeted journal: *Journal of Management.*

Conference Presentations

Zhang, F., Tims, M., Parker, S.K. When Is Decreasing Hindering Job Demands Positive? An Analysis of Job Crafting Profiles. (2019), In Fong, C. Y. M., Plomp, J., Xu, X., & Zhang, F. (2019). Job crafting in the changing work context and practical implications. 79th Annual Meeting of Academy of Management, Boston, United States.

Zhang, F., Parker, S.K. (2019), Reducing demands or optimizing demands? The effects of cognitive appraisal and job autonomy on job crafting strategies towards job demands. 33rd Annual Meeting of Australian and New Zealand Academy of Management. Cairns, Australia.

Details of the work: **Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review**
Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour, 40*(2), 126-146.

Location in thesis: Article 1

Student contribution to work: Please note this work has been published in the *Journal of Organizational Behaviour*. Fangfang led the development of the paper from conceptualization to final proofing and publication (including three rounds of revisions). Fangfang completed all the literature search and analyses to propose a three-level hierarchical structure of job crafting. Fangfang also conducted the review and synthesis of the literature based on the proposed nomological network. The recommendations and future directions were developed by Fangfang. Fangfang did the majority of writing with the assistance of her co-author. Fangfang also oversaw the response to reviewers and formal communication with the editorial team at the *Journal of Organizational Behaviour* leading up to the final acceptance, proofing, and publication.
Professor Parker provided feedback on the initial idea and extensive help through the writing and review process, including editing all sections of the paper.

Reorienting Job Crafting Research: A Hierarchical Structure of Job Crafting Concepts and Integrative Review

	Conceptualization	Methodology and Research Design	Data Source and Collection	Analysis and Statistical Method	Writing - Original Draft	Writing - Review and Editing	Total % contribution
Fangfang Zhang	80	N/A	100	N/A	100	80	80
Co-Author Sharon K. Parker	20	N/A	0	N/A	0	20	20
I acknowledge that these represent my contribution to the above research output Signed:							
Total %	100	N/A	100	N/A	100	100	100

Details of the work: **Reducing or optimizing demands? Effects of cognitive appraisal and autonomy on job crafting to change one's work demands**
Zhang, F., Parker, S.K. (2019), Reducing or optimizing demands? Effects of cognitive appraisal and autonomy on job crafting to change one's work demands. *Journal of Vocational Behaviour*, under review.

Location in thesis: Article 2

Student contribution to work: Please note this work has been submitted to the *Journal of Vocational Behaviour* for consideration. Specifically, Fangfang developed the original idea to investigate the effect of individuals' cognitive appraisals on their demands crafting. This article includes one filed study and two scenario-based experimental studies. Fangfang contributed to the article by building connections with industry to collect data in the field study, designing experiment materials, executing the experiments, analysing the data, and leading the write up of the paper.
Professor Parker provided ongoing guidance in the initial idea, study design, and experiment materials of this article. She also provided extensive help through the writing process, including editing all sections of the paper.

Reducing or Optimizing Demands?
Effects of Cognitive Appraisal and Autonomy on Job Crafting to Change One's Work Demands

	Conceptualization	Methodology and Research Design	Data Source and Collection	Analysis and Statistical Method	Writing - Original Draft	Writing - Review and Editing	Total % contribution
Fangfang Zhang	90	80	100	100	100	80	80
Co-Author Sharon K. Parker	10	20	0	0	0	20	20
I acknowledge that these represent my contribution to the above research output Signed:							
Total %	100	100	100	100	100	100	100

Details of the work: **When is decreasing hindering job demands positive? An analysis of job crafting profiles.**
Zhang, F., Tims, M., Parker, S.K. When is decreasing hindering job demands positive? An analysis of job crafting profiles. Targeted journal: *Journal of Management.*

Location in thesis: Article 3

Student contribution to work: Fangfang led the development of the paper from conceptualization to completion. Specifically, Fangfang developed the theory, research questions, and hypotheses. The hypotheses were tested by three separated studies. Data in Study 1 and Study 2 were provided by Associate Professor Maria. Fangfang also contributed to the article by executing the analyses and leading the write up of the paper.
Associate Professor Maria contributed to this article by providing two datasets and feedback on drafts of this paper.
Professor Sharon provided extensive help on reviewing and editing drafts of this paper.

When Is Decreasing Hindering Job Demands Positive? An Analysis of Job Crafting Profiles

	Conceptualization	Methodology and Research Design	Data Source and Collection	Analysis and Statistical Method	Writing - Original Draft	Writing - Review and Editing	Total % contribution
Fangfang Zhang	100	100	30	100	90	70	75
Co-Author 1 Maria Tims	0	0	70	0	10	15	15
I acknowledge that these represent my contribution to the above research output Signed:							
Co-Author 2 Sharon K. Parker	10	0	0	0	0	15	10
I acknowledge that these represent my contribution to the above research output Signed:							
Total %	100	100	100	100	100	100	100

Name: Fangfang Zhang

Signature: Date: 18/12/2019

I, **Professor Sharon K. Parker** certify that the student statements regarding their contribution to each of the works listed above are correct.

Signature: Date: 18/12/2019

Chapter 1. General Introduction

Background

People spend the vast majority of their waking time at work. Work could be either beneficial or detrimental to individuals, which largely depends on how the work is designed. Thus, organisational scholars have been dedicated to research on work design for decades. Work design is defined as "the content and organization of one's work tasks, activities, relationships, and responsibilities" (Parker, 2014, p.662). Vast research has shown that good work design is related to various desirable outcomes that are important for both individuals and organisations (Parker, 2014).

Work design theories have been evolving since the early 20th century. The early work design theory focused on job simplification, influenced by the notion of division of labour (Smith, 1776) and scientific management (Taylor, 1911). In the Taylorism work design, employees are assigned with low-skilled manual tasks, in which they follow prescribed procedures and standards. Managers were tasked with skilled managerial activities and monitoring employees' actions. Despite its positive effects on productivity, Taylorism work design sacrifices employees' motivation, health, and well-being (Walker & Guest, 1952). However, today, this approach of work design is still prevalent in various manufacturing and service jobs (Parker, Morgeson, & Johns, 2017).

The negative consequences of Taylorism prompted interest in designing work that is less mechanistic and more motivational. The most famous motivational work design theory is the Job Characteristics Model (JCM, Hackman & Oldham, 1976). The JCM defines five motivating job characteristics: autonomy, skill variety, feedback, task identify, and task significance. These job characteristics have been associated with a broader set of outcomes beyond job satisfaction, such as increased employee motivation and performance, reduced absenteeism and turnover (Fried & Ferris, 1987). To explain the mechanisms of the positive

effects of these job characteristics, Hackman and Oldham (1976) proposed three psychological states: experiencing meaningfulness in the job, feeling responsible for the results, and having knowledge of results. The JCM contributed to work design literature by acknowledging the critical role of individual differences in influencing the relationship between job characteristics and outcomes (Oldham, Hackman, & Pearce, 1976) and by presenting a measure (Hackman & Oldham, 1976).

The JCM has been criticized with limited inclusion of job characteristics as well as outcome variables. Building on the JCM, Parker, Wall, and Cordery (2001) proposed an extended job characteristic model, including a broader set of job characteristics (e.g., social characteristics) and outcomes (e.g., innovation, proactivity, and safety), as well as additional moderators and mediators. Another effort to expand the JCM was by Morgeson and Humphrey (2006), who expanded the five job characteristics into 21 job characteristics, covering motivational, knowledge, social, and contextual job characteristics. These job characteristics have been linked to various behavioural, attitudinal, and well-being outcomes (see Humphrey, Nahrgang, & Morgeson, 2007 for a meta-analysis). Results showed that besides motivational job characteristics, social and contextual job characteristics incrementally explained variances in important outcomes (Humphrey et al., 2007).

To address the criticisms of the JCM, Karasek (1979) proposed the job demands-control model, which includes the motivational job characteristics (i.e., job control) and detrimental job characteristics (i.e., job demands) of work design. Four types of jobs arose based on the level of job demands and job control: passive jobs with both low job demands and low control, low-strain jobs with low demands and high job control, high strain jobs with high job demands and low job control, active jobs with high job demands and high control. Karasek and Theorell (1990) incorporated social support into this model to form the demand-control-support model. This extended model proposed that jobs characterised by high job

demands and low job control would result in strain and physical symptoms. Conversely, when presented with high job control and support, the active job would be beneficial to employees (Karasek & Theorell, 1990). However, the buffering effects of job control on job demands have not been consistently supported in empirical research (Van der Doef, & Maes, 1999).

To provide an integrative view of job characteristics, Demerouti, Bakker, Nachreiner, and Schaufeli (2001) proposed the job demands-resources model (JD-R model), which classified various job characteristics into job resources and job demands. Job resources are defined as "physical, psychological, social, or organisational aspects of the job that may (1) be functional in achieving work goals; (2) reduce job demands at the associated physiological and psychological costs; (3) stimulate personal growth and development" (Demerouti et al., 2001, p.501). Examples of job resources are job autonomy, task variety, and development opportunities. Job demands are defined as "physical, social, or organisational aspects of the job that require sustained physical or mental effort and are associated with certain physiological and psychological costs" (Demerouti et al., 2001, p.501). Examples of job demands are workload, time pressure, and role conflict. This model has inspired thousands of empirical articles and continues to inspire studies and applications by scholars and practitioners. Empirical studies have investigated six propositions of the JD-R model (Bakker & Demerouti, 2017): all types of job characteristics can be classified into job resources and job demands (proposition 1); job demands stimulate a health-impairment process while job resources stimulate a motivational process (proposition 2); job resources can weaken the adverse effects of job demands (proposition 3); the relationships between job resources and motivations are stronger when job demands are high (proposition 4); personal resources function similarly as job resources (proposition 5); motivation is positively related to job performance while job strain is negatively associated with job performance (proposition 6).

To better understand the consequences of job demands, scholars have proposed that job demands can be classified as challenge demands and hindrance demands (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). Challenge demands are demands that create opportunities for performance and achievement (LePine, Podsakoff, & LePine, 2005). Hindrance demands align with the traditional conceptualisation of job demands defined as obstacles that require efforts to address. Two meta-analyses showed while both challenge demands and hindrance demands were associated with strain, challenge demands were also related to positive outcomes such as increased motivation and performance (Crawford, LePine, & Rich, 2010; LePine et al., 2005). In prior meta-analyses, the authors classified the stressors into challenge demands or hindrance demands. However, the most recent meta-analysis synthesized studies that tested the challenge-hindrance demand model since 2000 (Mazzola, & Disselhorst, 2019). Results showed a negative relationship between hindrance demands and performance, which is consistent with previous findings. However, the relationship between challenge demands and performance is not significant. Thus, the authors argued that the suggestion to increase challenge demands was not warranted. They suggested that future research should move away from the current challenge-hindrance demand model to other established models or a more appraisal-based approach.

Despite achievements in work design theory, scholars have called to put work design in context to reflect dramatic changes in the workforce and workplace (Grant, Fried, Parker, & Frese, 2010). Specifically, there are several limitations of work design due to rapid changes in the contemporary workplace. First, the development of digitalisation and competitive pressure has increased uncertainty in work, which increases difficulties for organisations and managers to design formalized job descriptions that define every specific task and activity of employees (Grant & Parker, 2009). Second, due to technological advances and increased competition, tasks and activities in jobs continue to evolve and transform (Cordery & Parker,

2012). Organisations and managers need to respond to these transformations and design work that best suits the context. However, as a formal management process, it takes time for work design to take place. Thus, it is difficult for organisations to adapt to changes in work design in a timely manner. Third, there has been increased variation in today's workforce in terms of demographics, background, and experience of employees (Cordery & Parker, 2012). Organisations and managers usually emphasize the optimal work design for the average job incumbents and limit individualization (Hornung, Rousseau, Glaser, Angerer, & Weigl, 2010). However, employees expect to work in jobs that fit their unique skills, abilities, motives, and preferences (Rousseau, Ho, & Greenberg, 2006), which raises another difficulty for the formal work design. Taken together, these difficulties in work design challenge the premise that employees are passive recipients of jobs assigned to them.

To address these challenges in work design research field, scholars have acknowledged that employees nowadays are likely to be and need to be proactive in designing their own job (Grant & Parker, 2009). Consequently, scholars have increasingly investigated how jobs can be structured so that employees actively customize their tasks, work activities, and environment. For example, Parker, Bindl, and Strauss (2010) argued that good work design can foster individuals' "can do", "reason to", and "energized to" motivational states, which in turn enhance their proactive behaviours. The initiative actions that employees take to change, shape, and mould their job aspects are referred to as job crafting (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). To take individuals' proactivity into account, the job demands-resources model has also been extended by incorporating job crafting (Bakker & Demerouti, 2017).

Job crafting has been regarded as a useful complement to address challenges in traditional work design. Empirical research has shown positive relationships of job crafting with a series of desirable outcomes, such as job satisfaction, work engagement, organisational

commitment, task performance and contextual performance (see Rudolph, Katz, Lavigne, & Zacher, 2017 for a meta-analysis). Due to the importance and effectiveness of job crafting in improving individuals' work design, studies on job crafting has been burgeoning in recent years. However, several critical challenges remain in this research area. First and foremost, job crafting literature remains fragmented due to two very different theoretical perspectives. Specifically, scholars who first coined the concept of job crafting (Wrzesniewski & Dutton, 2001) indicated that employees could change their jobs in terms of task and relational boundaries. They (Wrzesniewski & Dutton, 2001) proposed three types of job crafting: task crafting, relational crafting, and cognitive crafting. Later on, some scholars applied job demands-resources theory (Demerouti et al., 2001) to job crafting and proposed four types of job crafting: increasing structural job resources, increasing social job resources, increasing challenging job demands and decreasing hindering job demands (Tims, Bakker, & Derks, 2012).

The two job crafting perspectives differ in how they define the content of job crafting, which has brought several theoretical challenges in job crafting research, such as difficulty in articulating whether cognitive crafting is one type of job crafting, and how job crafting is related to the broad proactivity literature. Additionally, there have been multiple measures of job crafting, even within the same theoretical perspective. The confusion in measurement have brought more challenges to integrate studies from these two perspectives together.

This challenge is fundamental to job crafting research as it raised the problem of lacking understanding of job crafting construct in the existing literature. Without clarification of the job crafting construct and integration of job crafting constructs from different perspectives, job crafting research will remain disparate as two separate fields. Thus, a comprehensive new framework that can clarify the structure of job crafting and integrate different theoretical perspectives is imperative to reset the fundament of job crafting research.

Second, the vast majority of job crafting studies focused on crafting types that aimed to increase and build job resources in one's job. Little research has been done to understand what types of job crafting individuals can use to reshape their job demands, the antecedents, process, and consequences of their job crafting strategies to change job demands. Based on the job demands-resources theory (Demerouti et al., 2001), scholars (Tims & Bakker, 2010; Tims et al., 2012) have indicated that employees can decrease their job demands in their jobs when they feel overwhelmed. This strategy is assumed to be beneficial to prevent employees from exhaustion and to protect their well-being. However, most studies have reported adverse effects of decreasing hindering job demands, maybe because it is avoidance oriented (Demerouti, 2014; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012). To unpack individuals' crafting behaviours targeted to job demands, Demerouti and Peeters (2018) proposed that employees can restore fit with job demands by engaging in optimizing demands, the actions to simplify or optimize work processes to improve work efficiency. This strategy is approach oriented and expected to result in positive outcomes.

The investigation of individuals' demands crafting behaviours is essential due to several reasons. First, job demands are another main part of one's job besides job resources (Demerouti et al., 2001). Job demands nowadays have significantly increased in the contemporary workplace (Cascio, 2003), which highlights the importance of job crafting strategies to manage and restore fit with job demands. Second, unlike job crafting targeted to build job resources, employees' demands crafting behaviours are more complicated, as suggested by existing studies. Finally, investigation in demands crafting is important to unpack the comprehensiveness of employees' job crafting behaviours, to extend job crafting theory, and to move job crafting research forward. However, to date, little is known the antecedents and processes that why and how individuals employ the two different demands crafting strategies, what consequences of these demands crafting strategies are.

Aims and Objectives of This Thesis

The overarching aim of the present thesis is to provide a clarification and synthesis of job crafting literature and novel investigations into antecedents, processes, and consequences of individuals' demands crafting behaviours. The first aim of this thesis is to provide a clarification of job crafting construct and a synthesis of job crafting studies from different perspectives. Clarification of job crafting construct assumes that common characteristics are underlying the various job crafting types in different theoretical perspectives as they are all job crafting behaviours in general. Job crafting has been acknowledged as a multidimensional construct, but the differentiation characteristics in dimensions lack systematic clarification. For example, the dimensions of task crafting, relational crafting, and cognitive crafting are at different levels as task crafting and relational crafting can be classified as behavioural crafting, which is distinct from cognitive crafting. For another example, the dimensions of increasing structural job resources, increasing social job resources, increasing challenging job demands, and decreasing hindering job demands are also at different levels as the first three are approach-oriented crafting while the fourth is avoidance-oriented crafting.

Thus, to clarify job crafting construct, I identify three distinguishing characteristics of in defining various job crafting types: job crafting orientation, whether job crafting is approach-oriented or avoidance-oriented; job crafting form, whether job crafting is behavioural or cognitive; and job crafting content, whether the job crafting targeted to change job resources or job demands. With this new structure of job crafting construct, it is reasonable and feasible to synthesize studies from different perspectives as all different job crafting types can be mapped against job crafting constructs defined by the structure. Thus, applying this new structure, I provide a synthesis of research findings on antecedents, outcomes, mechanisms, and boundary conditions of job crafting.

As revealed by previous job crafting literature, how individuals use job crafting

strategies to reshape job demands lacks a thorough investigation. Thus, the second aim of this thesis is to investigate the antecedents and processes of individuals engaging in demands crafting. Previous job crafting research mainly focused on one demands crafting strategy: job crafting to reduce or decrease job demands (i.e., reducing demands), the avoidance-oriented job crafting. However, employees can engage in more approach-oriented crafting to change job demands, such as crafting strategies to optimize job demands (i.e., optimizing demands). As optimizing demands is a preferable strategy to craft job demands, understanding when and why employees employ these two different demands crafting strategies helps motivate more constructive responses to job demands.

Prior studies on antecedents of job crafting mainly focused on stable individual differences such as temperament (Bipp & Demerouti, 2015; Rudolph et al., 2017) and personality (Bakker, Tims, & Derks, 2012) which are difficult to intervene. In this article, I focus on individuals' cognitive appraisals, which are subject to intervention to provide significant practical implications. Specifically, I theorize and investigate that individuals' primary appraisal of challenge or hindrance affects their control appraisal, which in turn affects their choices of demands crafting strategies. The effect of job autonomy, one important job resources to deal with job demands, is also theorized and investigated.

The third aim of this thesis is to investigate the consequences of demands crafting. Prior studies mainly adopted the variable-centred approach and focused on the relationship between variables. From the variable-centred approach, most research showed adverse effects of decreasing hindering job demands (see Rudolph et al., 2017 for a meta-analysis). However, this approach did not consider the possibility that individuals may have different patterns in using job crafting strategies simultaneously. As approach crafting and avoidance crafting are aggregate components of job crafting, an individual may engage in different levels of approach crafting and avoidance crafting simultaneously. Thus, the effect of decreasing

hindering job demands may vary according to the level of approach crafting one person engages in. To investigate the different job crafting profiles and their relationship with significant outcomes (i.e., work engagement, task performance, and organisational citizenship behaviour), I adopt a person-centred approach and conduct latent profile analyses.

Below, I offer an overview of how each article pursues the above goals of this thesis and addresses the gaps in job crafting literature.

Thesis Overview

The present thesis includes three articles (chapter 2 to chapter 4). Chapter 2 (article 1) is a conceptual review of job crafting literature in which I propose a hierarchical structure of job crafting and synthesize empirical studies applying the new structure. In chapter 3 (article 2), I conduct a field study and two scenario-based experimental studies to investigate the process through which job demands are associated with two different demands crafting strategies. Finally, in chapter 4 (article 3), I adopt a person-centred approach to investigate job crafting profiles that depict the different combinations of using job crafting strategies. Below I give a brief introduction to each chapter.

The first article (chapter 2) has been published in the *Journal of Organisational Behaviour* (Zhang & Parker, 2019). It contributes to the theoretical clarification of job crafting construct and syntheses of job crafting literature from different theoretical perspectives. This article is composed of four sections. The first section presents how job crafting has been defined and measured in two very different perspectives and challenges in job crafting research due to these two disparate perspectives. In the next section, I identify the common aspects of job crafting constructs across the two perspectives and integrate them into a new three-level hierarchical structure, which has important implications for the clarification of job crafting concepts and measures. In the third section, applying the new hierarchical job crafting structure, I review and synthesize studies on antecedents and outcomes of job

crafting from both job crafting perspectives. The analyses of review results support the framework we use to classify different job crafting constructs. Finally, in the fourth section, I highlight the distinguishing aspect of job crafting orientation and suggest that approach crafting and avoidance crafting should not be aggregated into an overall score. To take a leap forward, I articulate eight recommendations covering construct, measurement, theoretical, and methodological issues for future research.

Having established the structure of job crafting constructs, in the second article (chapter 3), I provide a rigorous investigation into antecedents and processes that why and how individuals employ two different demands crafting strategies (i.e., optimizing demands and reducing demands). This novel investigation can pave the way for better identifying how to motivate more constructive responses to job demands. Drawing on the transactional theory of stress (Lazarus & Folkman, 1984), I theorize that individuals' primary appraisal of challenge or hindrance affects their secondary appraisal of control, which then affects their choice of demands crafting. I further theorize that individuals' primary appraisal interacts with their level of job autonomy to affect secondary control appraisals, with job autonomy also having a direct effect on control appraisals.

Due to the potential confounding issues of job demands, appraisals and job crafting in the field, although a field study (Study 1) was included to ensure the generalizability of results, the primary approach adopted in this article was a randomized experimental design (Study 2A and 2B). Overall, this article highlights the significance of taking individuals' cognitive appraisal into account when investigating how employees engage in different job crafting behaviours. This article contributes to both job crafting theory and the transactional theory of stress by revealing different mechanisms from job demands to demands crafting.

The third article (chapter 4) focuses on the consequences of decreasing hindering demands, one type of demands crafting strategy. This article addresses the debate on

decreasing hindering job demands, with some scholars recognizing it as a proactive behaviour (Bindl, Unsworth, Gibson, & Stride, 2018; Tims & Bakker, 2010), while others indicating it as a more passive withdraw behaviour (Demerouti, 2014; Petrou et al., 2012). Based on the review article (chapter 2), I argue that the effect of decreasing hindering job demands depends on to what extent job crafters engage in other approach-oriented job crafting behaviours (Zhang & Parker, 2019). If decreasing hindering job demands is employed as part of a proactive goal (e.g., reducing time spent on some tasks to focus on tasks that more important), it would show positive effects. Conversely, if decreasing hindering job demands is solely used without other approach-oriented job crafting, it is more passive and would show negative effects (Zhang & Parker, 2019). The above reasoning suggests that there might be different types of job crafters in a population, which warrants a person-centred approach assuming heterogeneous in a sample (Wang & Hanges, 2011). Consequently, I argue that theory will be advanced by examining different forms of crafting together rather than in isolation, which is the case of the traditional variable-centred approach.

To pursue this goal, applying a person-centred approach, I conduct two studies to investigate distinct job crafting profiles based on individuals' job crafting behaviours. After recognizing different types of crafters, I investigate the relationship of job crafting profiles with important outcomes (i.e., work engagement, task performance, and organisational citizenship behaviour) that have been widely investigated in the variable-centred approach. A key aspect to test the construct validation of latent profiles is to ascertain to what degree profiles can be generalized to distinct groups of participants and across multiple time points. Thus, I test the similarity of job crafting profiles across different samples (Study 1) and different times (Study 2).

In the final chapter of this thesis (chapter 5), I first discuss the overall findings of the

three articles. I then discuss how these articles in this thesis contribute collectively to job crafting research. I also acknowledge the main limitations of this thesis that need to be addressed in the future. To move job crafting research forward, I outline several recommendations to address limitations in both this thesis and broad job crafting literature. Finally, I offer several practical suggestions to managers and practitioners to manage employees' job crafting behaviours.

References

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology, 22*(3), 273–285.

Bakker, A. B., Tims, M., & Derks, D. (2012). Proactive personality and job performance: The role of job crafting and work engagement. *Human Relations, 65*(10), 1359-1378.

Bindl, U. K., Unsworth, K. L., Gibson, C. B., & Stride, C. B. (2019). Job crafting revisited: Implications of an extended framework for active changes at work. *Journal of Applied Psychology, 104*(5), 605-628.

Bipp, T., & Demerouti, E. (2015). Which employees craft their jobs and how? Basic dimensions of personality and employees' job crafting behaviour. *Journal of Occupational and Organizational Psychology, 88*(4), 631-655.

Cascio, W. F. (2003). Changes in workers, work, and organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Industrial and Organizational Psychology* (Vol. 12, pp. 401–422). New York, NY: John Wiley & Sons.

Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among U.S. managers. *Journal of Applied Psychology, 85*(1), 65–74.

Cordery, J. L., & Parker, S. K. (2012). Job and role design. In S. Kozlowski (Ed.), *Oxford handbook of industrial and organizational psychology* (Vol 1, pp. 247–284). Oxford: Oxford University Press.

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology, 95*(5), 834–848.

Demerouti, E. (2014). Design your own job through job crafting. *European Psychologist, 19*(4), 237–247.

Demerouti, E., & Peeters, M. C. (2018). Transmission of reduction-oriented crafting among colleagues: A diary study on the moderating role of working conditions. *Journal of Occupational and Organizational Psychology, 91*(2), 209-234.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499-512.

Fried, Y., & Ferris, G. R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology, 40*(2), 287-322.

Grant, A. M., & Parker, S. K. (2009). 7 redesigning work design theories: the rise of relational and proactive perspectives. *The Academy of Management Annals*, *3*(1), 317-375.

Grant, A. M., Fried, Y., Parker, S. K., & Frese, M. (2010). Putting job design in context: Introduction to the special issue. *Journal of Organizational Behaviour, 31*(2-3), 145-157.

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behaviour and Human Performance*, *16*(2), 250-279.

Hornung, S., Rousseau, D. M., Glaser, J., Angerer, P., & Weigl, M. (2010). Beyond top-down and bottom-up work redesign: Customizing job content through idiosyncratic deals. *Journal of Organizational Behaviour, 31*(2-3), 187-215.

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, *92*(5), 1332-1356.

Karasek Jr, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*(2),285-308.

Karasek, R., & Theorell, T. (1990). Healthy work: Stress, productivity, and the reconstruction

of working life. *The American Journal of Public Health, 80,* 1013–1014.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, Springer publishing company.

LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*, *48*(5), 764-775.

Mazzola, J. J., & Disselhorst, R. (2019). Should we be "challenging" employees?: A critical review and meta-analysis of the challenge-hindrance model of stress. *Journal of Organizational Behaviour, 40*(8), 949-961.

Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology*, *91*(6), 1321.

Oldham, G. R., Hackman, J. R., & Pearce, J. L. (1976). Conditions under which employees respond positively to enriched work. *Journal of Applied Psychology*, *61*(4), 395.

Parker, S. K. (2014). Beyond motivation: Job and work design for development, health, ambidexterity, and more. *Annual Review of Psychology*, *65*, 661-691.

Parker, S. K., Bindl, U. K., & Strauss, K. (2010). Making things happen: A model of proactive motivation. *Journal of Management*, *36*(4), 827-856.

Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology, 102*(3), 403–420.

Parker, S. K., Wall, T. D., & Cordery, J. L. (2001). Future work design research and practice: Towards an elaborated model of work design. *Journal of Occupational and Organizational Psychology*, *74*(4), 413-440.

Petrou, P., Demerouti, E., Peeters, M. C., Schaufeli, W. B., & Hetland, J. (2012). Crafting a

job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behaviour, 33*(8), 1120–1141.

Rousseau, D. M., Ho, V. T., & Greenberg, J. (2006). I-deals: Idiosyncratic terms in employment relationships. *Academy of Management Review*, *31*(4), 977-994.

Rudolph, C. W., Katz, I. M., Lavigne, K. N., & Zacher, H. (2017). Job crafting: A meta-analysis of relationships with individual differences, job characteristics, and work outcomes. *Journal of Vocational Behaviour*, *102*, 112-138.

Smith, A. (1776). *The wealth of nations*. London: W. Strahan and T. Cadell.

Taylor, F. W. (1911). *Scientific management*. New York, NY: Harper Row.

Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology*, *36*(2), 1-9.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behaviour*, *80*(1), 173-186.

Van der Doef, M., & Maes, S. (1999). The job demand-control (-support) model and psychological well-being: a review of 20 years of empirical research. *Work & Stress*, *13*(2), 87-114.

Walker, C. R., & Guest, R. H. (1952). *The man on the assembly line*. Cambridge: Harvard University Press.

Wang, M., & Hanges, P. J. (2011). Latent class procedures: Applications to organizational research. *Organizational Research Methods*, *14*(1), 24-31.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*(2), 179-201.

Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour*, *40*(2), 126-146.

Chapter 2: Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review

Fangfang Zhang

fangfang.zhang@postgrad.curtin.edu.au

Sharon K. Parker

s.parker@curtin.edu.au

School of Management, Faculty of Business and Law, Curtin University

Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour, 40*(2), 126-146.

Abstract

Two dominant perspectives of job crafting - the original theory from Wrzesniewski and Dutton, 2001, and the job demands resources perspective from Tims, Bakker, and Derks, 2012 - remain separate in research. To synthesize these perspectives, we propose a three-level hierarchical structure of job crafting, and we identify the aggregate/superordinate nature of each major job-crafting construct. The first level of the structure is job crafting orientation, or approach versus avoidance crafting, which we argue is an essential yet often neglected distinction in the literature. We address the debate surrounding cognitive crafting and identify crafting form (behavioural versus cognitive crafting) as the next hierarchical level of constructs. Finally, we concur that job resources and job demands, or crafting content, capture different ways that individuals craft their jobs. Using this integrated hierarchical structure, we were able to review antecedents and outcomes from both perspectives. We show, for example, that approach crafting in its behavioural form is very similar to other proactive behaviours in the way it functions, suggesting a need for closer synthesis with the broader proactive literature, whereas avoidance crafting appears to be less proactive and often dysfunctional. Based on our review, we develop a road map for future research.

Keywords: job crafting, work design, proactive behaviour, job demands–resources model, approach–avoidance motivation

Introduction

With global economic and technological developments, there are growing levels of uncertainty and complexity in the workplace, as well as increasing diversity of the workforce. Against this background, it is difficult, and sometimes impractical, for organizations to design favourable jobs that fit all employees (Grant & Parker, 2009). Consequently, scholars have suggested that it is important to design flexible jobs in which employees can proactively change their tasks and roles (Grant & Parker, 2009). The self-initiated behaviours that employees take to shape, mould, and change their jobs have been referred to as job crafting (Tims & Bakker, 2010; Tims, Bakker, & Derks, 2012; Wrzesniewski & Dutton, 2001). This notion of job crafting has increasingly been seen as a major advance in work design theory, with its emphasis on bottom-up, employee-initiated work redesign distinct from the traditional top-down work design in which managers or employers create jobs and roles (Hornung, Rousseau, Glaser, Angerer, & Weigl, 2010; Grant, Fried, Parker, & Frese, 2010).

Likely reflecting its value in today's dynamic environment, the amount of research on job crafting is burgeoning (see supplement Figure 1). Consistent with this growth in literature, review papers (Demerouti, 2014; Lee & Lee, 2018; Wang, Demerouti, & Bakker, 2016) and meta-analyses (Lichtenthaler & Fischbach, 2016a; Rudolph, Katz, Lavigne, & Zacher, 2017) have emerged that have been helpful in synthesizing the diffuse set of studies. Nevertheless, there are two distinct theoretical perspectives on crafting (one is the job demands–resources perspective from Tims et al., 2012; the other is from Wrzesniewski and Dutton, 2001), which remain largely disparate. While scholars (Bruning & Campion, 2018) have made progress in integrating the two different frameworks, the issue has not been fully addressed, as we discuss shortly. If a way to better synthesize research from the different perspectives is not found, research on job crafting will become— unnecessarily—two separate fields.

Our aim in this review is to take stock of what we know about job crafting and, most crucially, to provide the conceptual synthesis and construct clarification needed to move the area forward. In line with recommended approaches (Short, 2009), we searched electronic databases Web of Science, ProQuest, EBSCO Business Source Complete, PsycINFO and ScienceDirect to identify peer-reviewed articles with "job crafting" in their titles, keywords or abstracts. This revealed 766 hits overall. Following the systematic search, duplicates were removed and the remining titles and abstracts screened for inclusion. Among 141 eligible records, we excluded 8 articles without access to full-text and 8 job crafting intervention studies. Consequently, 125 articles were included, of which 118 were empirical (See supplement Figure 2).[1]

We organize the findings from our analysis of these articles into four main sections. In the first section, we review how job crafting has been conceptualized and measured. In the second section, we identify common aspects of job crafting across the two theoretical perspectives, which are then integrated into a hierarchical structure. In the third section, we use the hierarchical structure to summarize key antecedents, outcomes, explanatory mechanisms, and boundary conditions of job crafting research. In the final section, we identify significant issues that inhibit progress in this research field and develop an agenda for future research.

Job Crafting: Moving Toward Conceptual Clarity

Two conceptualizations of job crafting are widely accepted and applied in research. Here we discuss the defining characteristics of job crafting identified in these dominant perspectives, efforts to bring these perspectives together, and our approach to synthesizing the perspectives.

Different perspectives of job crafting

[1] This search was conducted in September 2018.

The first use of the term *job crafting* came from Wrzesniewski and Dutton (2001), who defined it as “the physical and cognitive changes individuals make in the task or relational boundaries of their work” (p. 179). From this perspective, employees are assumed to revise their work identities and to enhance the meaning of their work through three types of crafting: task crafting, relational crafting, and cognitive crafting. Task crafting involves changing the job's task boundaries by changing the number, scope, or type of job tasks done at work (e.g., taking on more tasks that one is interested in). Relational crafting refers to initiating changes in the relational aspects of the job, such as changing the quality and/or amount of interaction with others at work (e.g., a computer technician provides help to co-workers as a way to connect with more people). Cognitive crafting involves altering how one frames or views the job (e.g., a hospital janitor seeing the job as healing ill people rather than simply cleaning).

The second dominant perspective derives from work design theory. Tims et al. (2012) defined job crafting in terms of the job demands–resources theory (Bakker & Demerouti, 2007), as “the changes that employees may make to balance their job demands and job resources with their personal abilities and needs” (p. 174; also in Tims & Bakker, 2010). Job demands refer to job aspects that require sustained physical, emotional, or mental effort, while job resources refer to job aspects that stimulate personal growth and development, reduce job demands, or are functional in achieving work goals (Bakker & Demerouti, 2007). Specifically, Tims et al. (2012) identified four different dimensions of job crafting: 1) increasing structural job resources (e.g., enhancing one’s opportunity for development), 2) increasing social job resources (e.g., asking for feedback from one’s supervisor), 3) increasing challenging job demands (e.g., taking on extra tasks), and 4) decreasing hindering job demands (e.g., making sure one’s job is emotionally less intense). Both theoretical perspectives indicate that employees can expand (e.g., by adding more tasks or relationships)

or shrink (e.g., by reducing their workload) their jobs and roles.

These two conceptual perspectives on job crafting differ in important ways. They differ in how they define the content of crafting, with Wrzesniewski and Dutton (2001) focusing on changes in task/relational/cognitive boundaries, whereas Tims et al. (2012) focused on changes in job characteristics. They also differ with respect to the purpose or aims underpinning crafting, with Wrzesniewski and Dutton (2001) considering crafting as a way to improve meaning and work identity, whereas Tims et al. (2012) considering crafting as a way to balance job resources and demands so as to achieve person–job fit. This incongruence in perspectives has brought some challenges to the literature. First, there is confusion in judging which behaviours are job crafting and which are not, as well as difficulties mapping the construct across the perspectives. For example, Tims et al. (2012) argued that job crafting can take other forms beyond task, relational, and cognitive changes, such as employee self-initiated skill development. Likewise, although Demerouti (2014) argued that task crafting can be seen as changing job demands, and that relational crafting can be interpreted as changing social resources, the integration of these different types of crafting is not so straightforward. For example, an employee who adds tasks (task crafting) might not only change job demands as reasoned by Demerouti, but could also change his or her task or skill variety, which Tims et al. (2012) refer to as “increasing structural job resources.” Such confusion makes it challenging to synthesize findings.

Second, there is an unresolved debate as to whether cognitive job crafting is a type of job crafting. From the perspective of Wrzesniewski and Dutton (2001), the cognitive component of crafting is crucial and indeed is viewed as the facet of crafting that aligns most closely to meaning in work and work identity. These authors argued that through reframing or redefining the way they perceive the work, employees can achieve fit with environment directly, even without a behavioural change (Berg, Dutton, & Wrzesniewski, 2013;

Wrzesniewski & Dutton, 2001). From the job demands–resources perspective, however, scholars argued that cognitive crafting is more likely a form of passive adaption to work, which leads to no real change in job content, and hence is not what these authors consider crafting (Bakker, Tims, & Derks, 2012; Tims & Bakker, 2010). The role of cognitive crafting is thus unclear.

A third consequence of the divergent definitions of crafting is that it has been difficult to characterize how job crafting is similar to or different from other concepts, especially with other types of proactive behaviour. Previous analyses (e.g., Niessen, Weseler, & Kostova, 2016; Tims & Bakker, 2010) have compared job crafting to some specific concepts (e.g., personal initiative, taking charge, task revision), but how different types of job crafting fit into a broad proactivity scheme has rarely been discussed. For example, whether decreasing hindering demands (Tims et al., 2012) is proactive behaviour is not clear.

Finally, reflecting the definitional challenges, there is a confusion of measurement. Distinct measures exist across the two perspectives and even within the same perspective (see Supplement Table 1). Applications of various measures have made it challenging to clearly identify the antecedents, outcomes, and mechanisms of job crafting.

For all of these reasons, research on the two perspectives has tended to proceed while isolating them from each other. Indeed, both existing meta-analyses (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017) have focused on studies conceptualized from the job demands–resources perspective. Although empirical studies conceptualized from this perspective are dominant (68 out of 90 empirical studies since 2012), studies conceptualized from Wrzesniewski and Dutton's (2001) perspective also provide important insights. Finding a way to bring these perspectives together, therefore, is a crucial next step for this domain of research.

Existing integrative efforts

There has been little effort to integrate the two theoretical frameworks within the existing literature. An important exception is the recent study by Bruning and Campion (2018), who began by clarifying job crafting as "the changes to a job that workers make with the intention of improving the job for themselves" (p.500). These authors summarized six defining characteristics of job crafting. First, job crafting is self-targeted and intended to benefit individuals themselves. Second, job crafting involves volitional, conscious, and intentional change. Third, job crafting requires that there is a noticeable deviation between the crafted and pre-crafted job. Fourth, job crafting should result in permanent or semi-permanent changes rather than temporary changes. Fifth, job crafting aims to change the job role rather than the leisure time. Sixth, job crafting applies to a job with a clear description and specified tasks as opposed to self-created jobs such as a self-employed consultant. Although Bruning and Campion's (2018) definition is helpful in encompassing the key elements of job crafting recognized by the two major perspectives, we note two further defining characteristics. First, job crafting occurs within the zone of acceptance of one's boss or peers, and requiring formal approval is not necessary (although we nevertheless expect that individuals will sometimes discuss their crafting with others). This makes crafting distinct from task idiosyncratic deals in which employees must influence their employer to get formal approval and authorization. As Hornung et al. (2010) noted, "although job crafting principally refers to constructive, legitimate actions, it is not explicitly authorized by the employer" (p.190). A further defining characteristic is that job crafting involves changing the intrinsic characteristics of one's job rather than extrinsic characteristics such as pay (Tims et al., 2012; Wrzesniewski & Dutton, 2001).

With this definition in mind, the next challenge concerns how different types of crafting fit together. Bruning and Campion (2018) defined Wrzesniewski and Dutton's (2001) job crafting perspective as "role-based crafting," which represents an employee-centric

adaptation of the motivational function of job design (Campion & Thayer, 1985), and Tims et al.'s (2012) approach as "resource-based job crafting," which represents an employee-focused mechanistic (i.e., job simplification and job specialization) job design (Campion & Thayer, 1985). However, although Bruning and Campion's (2018) integration efforts are an important step, they are also limited. While role crafting from Wrzesniewski and Dutton's (2001) perspective has a strong emphasis on improving work meaning and intrinsic work motivation, resource crafting from Tims et al.'s (2012) perspective is not as mechanistic as asserted. In fact, both job crafting perspectives have demonstrated that employees can change aspects of their jobs to achieve not only person–job fit (mechanistic) but also better work motivation and well-being (motivational), as indeed borne out by empirical studies. For example, what these authors label "role crafting" enhances employees' demands–abilities fit and needs–supplies fit (Lu, Wang, Lu, Du, & Bakker, 2014), while what they refer to as "resource crafting" promotes meaningfulness (Tims, Derks, & Bakker, 2016). There is also overlap between role crafting and resource crafting. For example, one item of "work role expansion" (considered to be role crafting) is "expand my work activities to acquire resources that will help me do my job" (Bruning & Campion, 2018, p.522), which also seems to fit with the notion of resource crafting. Ultimately, we see both role crafting and resource crafting as involving motivational elements, so we question this way of synthesizing the perspectives. Nevertheless, as we discuss shortly, these authors' contribution in terms of identifying approach versus avoidance crafting is a useful distinction.

In what follows, based on our review, we propose a novel way to synthesize diverse perspectives on crafting in the literature that avoids some of the problems of existing schemes.

Job Crafting: A Proposed Hierarchical Structure

As shown in Figure 1b, prior conceptualizations have tended to assume that job

crafting is multidimensional with all dimensions being manifestations of overall job crafting. In contrast, we propose a hierarchical structure with three levels of crafting constructs that together define eight types of job crafting that relate with each other in particular ways (see Figure 1a). The first and highest level distinguishes *job crafting orientation*, that is, whether crafting is approach- or avoidance-oriented. The second level distinguishes *job crafting form*, specifically, whether crafting is behavioural or cognitive. The third level distinguishes *job crafting content* with respect to the target that crafting seeks to change, notably job resources or job demands.

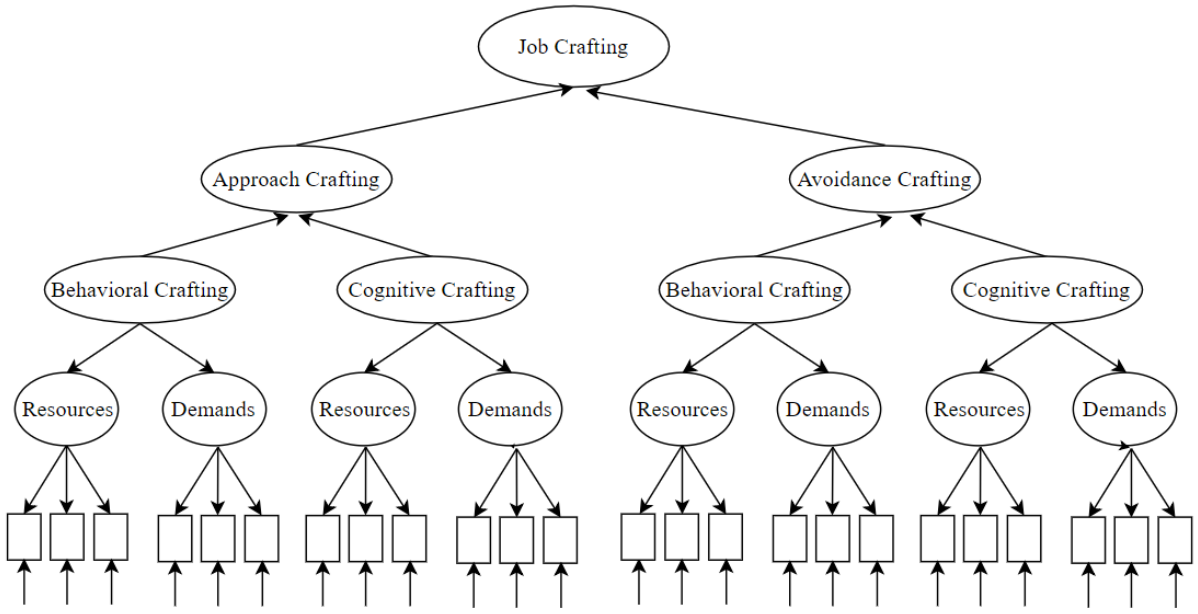


Figure 1a: The proposed hierarchical structure of job crafting

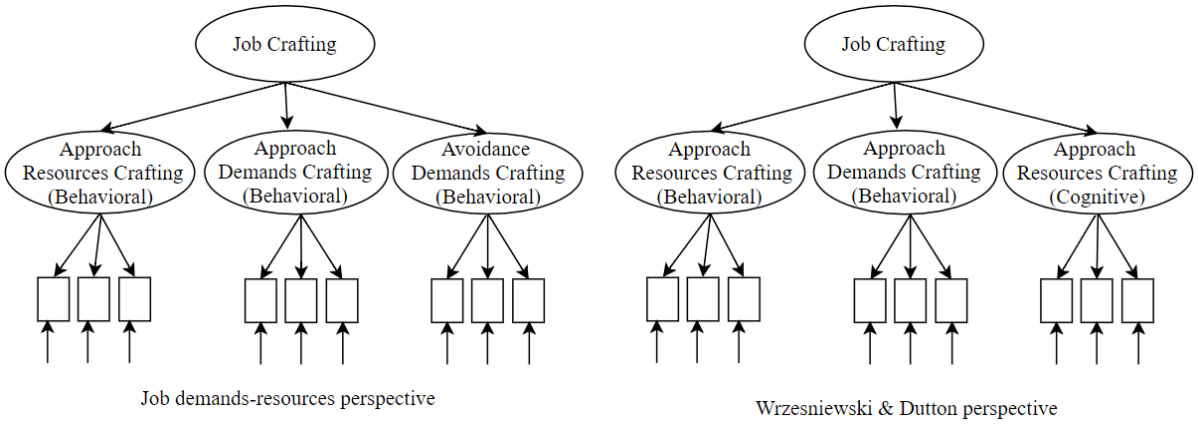


Figure 1b: Job crafting structure from existing perspectives

An important feature of our proposed structure is that, consistent with recommendations (MacKenzie, Podsakoff, & Jarvis, 2005), we identify whether the higher-order construct is an aggregate or superordinate construct (depicted by the direction of arrows in Figure 1a). Superordinate constructs are conceptualized as general concepts that are manifested by their dimensions, whereas aggregate constructs are functions or composites of dimensions which form into more general concepts. Three key criteria distinguish superordinate from aggregate constructs: interchangeability of dimensions, covariation among dimensions, and the stability of antecedents and outcomes of dimensions (MacKenzie et al., 2005). Without attention to the aggregate or superordinate feature of job crafting, research will be limited in testing and further developing theory in meaningful ways. Unclear theoretical constructs also cause the misspecification of measurement models, which in turn inflates unstandardized structural parameter estimates and leads to Type I or Type II errors of inference (MacKenzie et al., 2005).

Next, we elaborate the levels that distinguish different crafting dimensions. We then briefly describe the eight types of crafting. Finally, we summarize the value of the proposed hierarchical structure for synthesizing crafting concepts.

Job crafting orientation: Approach versus avoidance crafting

Scholars following the two dominant crafting perspectives agree that employees both enrich and expand, or reduce and limit, their job boundaries (e.g., Laurence, 2010; Petrou et al., 2012; Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). This distinction has been discussed in the existing literature, albeit with different terminologies, including promotion-focused versus prevention-focused job crafting (Lichtenthaler & Fischbach, 2016a) based on regulatory focus theory (Higgins, 1997), and approach versus avoidance crafting (Bruning & Campion, 2018) based on approach–avoidance motivation theory (Elliot, 2006). We argue that approach–avoidance motivation theory is the most relevant, being more systemic.

Although both regulatory focus theory and approach–avoidance motivation theory recognize that individuals have tendencies to move toward positive end-states and away from negative end-states, research shows that approach and avoidance tendencies at the high system level can influence the regulatory focus at the lower strategic and tactical levels when people pursue their goals (Scholer & Higgins, 2008).

Although our proposed distinction between approach and avoidance crafting already exists in the literature, we go further to identify approach and avoidance crafting as two distinct higher-order constructs that are aggregate components of an overall job crafting concept. Approach and avoidance crafting are neither conceptually nor empirically interchangeable. Covariation between the concepts is low. Dimensions of approach crafting and avoidance crafting have non-significant or very weak relationships (*r*: .005 ~ .133, Rudolph et al., 2017), and the meta-analytic CFA model of a one-factor job crafting indicated a low factor loading of avoiding hindering demands. Empirical studies and meta-analytic results have shown different and almost opposite antecedents and outcomes of approach crafting and avoidance crafting (as we elaborate later). Altogether, therefore, approach crafting and avoidance crafting appear to be conceptually distinct, and hence aggregate components of job crafting. We discus shortly the implications of this key point.

Job crafting form: Cognitive versus behavioural crafting

We propose job crafting form—the difference between cognitive and behavioural crafting—as the second most important distinction between types of crafting. Implicit in this distinction is that we assert cognitive crafting is indeed crafting, which some scholars have disputed (Niessen et al., 2016; Slemp & Vella-Brodrick, 2013). Cognitive crafting involves altering how one frames or views their tasks or job, which is self-initiated, self-targeted, intentional, and represents meaningful changes to the job aspects (Wrzesniewski & Dutton, 2001). Although cognitive crafting is intangible compared with behavioural job crafting, it is

an important way for employees to influence their work meaning, work identity, and emotions (Berg et al., 2013; Lichtenthaler & Fischbach, 2016a; Wrzesniewski & Dutton, 2001). Cognitive crafting relates to the notion of perceived job characteristics, with perceptions being shaped not only by objective characteristics but also by, for instance, individuals' experiences and interactions with others (Daniels, 2006). In essence, perceived job characteristics can reflect, at least in part, cognitive crafting. The study of "dirty workers" who use ideological techniques to change the way they view their job and role is a good example of how employees' cognitive strategies can influence their judgment of job characteristics (Ashforth & Kreiner, 1999). In a similar vein, cognitive crafting occurs when employees expand their role orientation (Parker, Wall, & Jackson, 1997) or their perceived job breadth (Morrison, 1994). Crucially, cognitive crafting consists of the active and intentional changes that individuals make in how they see their tasks and work roles.

Nevertheless, like the approach/avoidance distinction, we also propose that cognitive crafting and behavioural crafting have aggregate features. In other words, cognitive crafting and behavioural crafting are not conceptually interchangeable. Studies have indicated that they likely have different antecedents and outcomes (Niessen et al., 2016; Weseler & Niessen, 2016), and preliminary research has indicated that cognitive crafting has only moderate relationships with behavioural crafting (e.g., Niessen et al., 2016; Slemp & Vella-Brodrick, 2013, 2014). The latter relationships might occur because cognitive crafting and behavioural crafting are reciprocally related to each other. For example, drawing on research on the powerful role of cognition in shaping individuals' behaviours, Unsworth, Mason, and Jones (2004) argued that employees can selectively reframe the way they perceive their job characteristics, and those perceptions then shape their reactions and behaviours. Likewise, behavioural crafting can lead to cognitive crafting, such as when tangible changes in a job due to behavioural crafting shape how an individual views his or her new role.

Job crafting content: Resources crafting versus demands crafting

We propose job content (resources versus demands) as a further important way to categorize job crafting concepts. In contrast to the above levels, however, we suggest that job demands and job resources crafting are superordinate components of job crafting. In other words, these types of crafting are conceptually related: they covary and have common relationships with other variables. Meta-analytic results show that approach resources crafting and approach demands crafting are moderately correlated (*r*: .398 ~ .671) and share similar antecedents and outcomes (Rudolph et al., 2017).

Our focus on job resources versus job demands aligns more with the Tims et al.'s (2012) approach than the Wrzesniewski and Dutton's (2001) perspective, with the former focusing on how individuals change the design of their jobs (i.e., job resources and job demands) directly and the latter focusing on changing task and relational boundaries. As a bottom-up approach to work redesign, we concur with Tims et al. (2012) that focusing on job demands and job resources crafting captures the key ways in which individuals can craft their work. We identify, however, one important exception and one important caveat. The exception is that—in the existing crafting literature—job demands has not typically encompassed two important demands covered in role theory, that is, role conflict and role ambiguity. Following Parker, Morgeson, and Johns (2017), who included role theory as a work design theory, we suggest that crafting demands can include changing one's role conflict or role ambiguity, in the same way that it currently focuses on changing one's role overload. For example, an individual can take steps to obtain clarity about what is required of him/her or reduce role conflict by introducing and agreeing on priorities for decision-making. The important caveat is that while job crafting theoretically encapsulates many job resources and job demands, in fact the coverage of measures has been very limited (See Supplement Table 2), an issue we elaborate later when we discuss the measurement of crafting.

Eight types of crafting arising from the proposed hierarchical structure

Approach Crafting (Behavioural) (Seeking and acting to achieve positive aspects)		**Approach Crafting (Cognitive)** (Seeking to achieve positive aspects cognitively)	
Job Resources	**Job Demands**	**Job Resources**	**Job Demands**
Approach resources crafting (Behavioural)	**Approach demands crafting (Behavioural)**	**Approach resources crafting (Cognitive)**	**Approach demands crafting (Cognitive)**
Definition: Actions to gain positive job resources	*Definition:* Actions to increase one's challenging demands or address hindering demands	*Definition:* Reframing one's job to gain positive job resources	*Definition:* Reframing one's demands as either more challenging or less hindrance
Example: Alex actively participates in tasks/projects that have opportunities to develop new skills.	*Example:* Alex works on tasks beyond his/her formal responsibilities; Alex asks others about his/her expected duties when the role is ambiguous	*Example:* Alex reframes his/her job to see it as an inventor rather than just a technician	*Example:* Alex perceives customer complaints as opportunities to improve the software and his/ her communication skills
Existing measures: Work organization, adoption, social expansion[1]; task /relational expansion[2]; task/relational crafting-extending[3]; task/relational crafting[4]; increasing structural/ social resources[5]; seeking resources[6]; crafting toward strengths/ interests[8]	*Existing measures*: Work role expansion[1]; task crafting-extending[3]; task crafting[4]; increasing challenging demands[5]; seeking challenges[6]; optimizing demands[7]	*Existing measures*: Cognitive crafting[3,4]	*Existing measures*: N/A
Avoidance Crafting (Behavioural) (Escaping and moving away from negative aspects)		**Avoidance Crafting (Cognitive)** (Moving away from negative aspects cognitively)	
Job Resources	**Job Demands**	**Job Resources**	**Job Demands**
Avoidance resources crafting (Behavioural)	**Avoidance demands crafting (Behavioural)**	**Avoidance resources crafting (Cognitive)**	**Avoidance demands crafting (Cognitive)**
Definition: Actions to avoid aspects of the job that lack positive resources	*Definition:* Actions to avoid hindering demands	*Definition:* Reframing one's job to avoid or diminish aspects of the job that lack resources	*Definition:* Reframing one's job to avoid the experience of demands
Example: Alex rejects participating in projects that lack support or decision latitude	*Example:* Alex tries to keep his/her work less intensive by avoiding some tasks; Alex does not take on roles that are ambiguous	*Example:* Alex tries to perceive her/his job as more about software designing, which is interesting to Alex, rather than coding, which is not interesting to Alex	*Example:* Alex thinks dealing with unsatisfied customers is not his/her job
Existing measures: N/A	*Existing measures*: Withdraw crafting, work role reduction[1]; task/relational contraction[2]; task/relational crafting-reducing[3]; decreasing hindering demands[5]; reducing demands[6]	*Existing measures*: N/A	*Existing measures*: N/A

Note: 1: Bruning & Campion, 2018; 2: Laurence, 2010; 3: Weseler & Niessen, 2016; 4: Slemp & Vella-Brodrick, 2013; 5: Tims et al., 2012; 6: Petrou et al, 2012; 7: Demerouti & Peeters, 2017; 8: Kooij et al., 2017

Figure 2: The eight types of job crafting

The proposed hierarchical structure defines eight specific types of job crafting that relate to each other in particular ways. Figure 2 describes each type, provides examples, and

shows where and how existing crafting concepts can be mapped against the eight types.

In brief, approach crafting involves effortful and directed actions to seek positive aspects of work. Approach crafting can be either behavioural or cognitive, and both behavioural and cognitive approach crafting can be resource-focused or demand-focused. This classification defines four types of approach crafting. First, *approach resources crafting (behavioural)* involves crafting one's job by seeking positive intrinsic aspects of work, or job resources (e.g., increasing one's job autonomy or one's development opportunities). Second, *approach demands crafting (behavioural)* involves actions to increase challenging demands or address hindering demands (e.g., taking on extra tasks or improving the work process to deal with workload). Third, *approach resources crafting (cognitive)* involves reframing one's job or role in such a way as to perceive more positive aspects of the work (e.g., actively reminding oneself of the broader meaning of one's job). Fourth, *approach demands crafting (cognitive)* involves positively re-appraising one's demands (e.g., viewing demands as opportunities to learn and develop). All of these types of approach crafting are active and positive in emphasis.

In contrast to approach crafting, avoidance crafting involves effortful and directed actions to avoid, or escape from, negative aspects of work. Avoidance crafting can be behavioural or cognitive, and both behavioural and cognitive approach crafting can be resource-focused or demand-focused, which defines four additional types of crafting. The fifth type of crafting, *avoidance resources crafting (behavioural)*, focuses on stepping away from or avoiding work that is low in positive resources (e.g., avoiding a project that lacks autonomy). Sixth, *avoidance demands crafting (behavioural)* refers to stepping away from or avoiding hindering demands, such as withdrawing from situations with unfavourable job demands. Seventh, *avoidance resources crafting (cognitive)* involves cognitively stepping away from or avoiding work that is low in positive resources. Eighth and finally, *avoidance*

demands crafting (cognitive) involves mentally diminishing or reframing demands (e.g., downplaying the importance of some demanding aspects of one's role or job).[2]

It is important to elaborate further the distinction between avoidance resources crafting and avoidance demands crafting as the distinction between the 'lack of a resource' and a 'demand' might not be apparent on the surface. Importantly, the absence of a job resource does not represent a job demand (Bakker, & Demerouti, 2017). Based on the definition of job resources as being aspects of work that help one to achieve one's goals, manage one's demands, or that stimulate growth (Bakker & Demerouti, 2007), avoidance resources crafting means not taking on or avoiding situations that are lacking such elements. An example might be a professional staying away from projects that lack autonomy as s/he knows it will be hard to learn in that situation, or avoiding projects in which s/he knows the atmosphere will be unfriendly, which the professional knows will get in the way of his/her goal to build new networks. However, if this same professional avoids projects that s/he knows are going to be extremely emotionally taxing, requiring high levels of self-regulation, then this constitutes avoidance demands crafting. Likewise, if the person is avoiding a project that has a toxic atmosphere with bullying, this is avoidance demands crafting because the person is not simply staying away from a 'less positive situation that won't meet their development goals' but they are avoiding the emotional toll and depletion of a highly demanding situation. As these examples highlight, both types of avoidance crafting involve avoiding negative job aspects or outcomes, but the negative aspect varies in each case. Avoidance resources crafting means staying away from situations that inhibit one's learning or the achievement of one's goals, while avoidance demands crafting means staying away from tasks or activities that will be depleting and involve excess effort.

[2] As this review almost exclusively focuses on behavioral crafting, we did not repeatedly include (behavioral) when we talk about behavioral crafting in following text, but keep using (cognitive) when we talk about cognitive crafting.

Implications of the proposed structure and types of crafting

First, this structure unifies different job crafting perspectives. We suggest that many types of cognitive and behavioural actions that seem distinct on the surface are indeed all crafting: they all fit the definition we introduced earlier that crafting is intentional changes employees make to improve their work (Bruning & Campion, 2018). Moreover, as Figure 2 shows, seeking resources and challenges from the job demands–resources perspective and task crafting and relational crafting from Wrzesniewski and Dutton's (2001) perspective are both approach crafting. As we report in more depth, empirical studies have shown that approach crafting, albeit derived from different theoretical perspectives, exhibits similar positive effects on desirable outcomes. The existing focus on "content" as the main difference between two perspectives has perhaps distracted our attention from their key similarities. The hierarchical structure helps to better unite crafting concepts under a single umbrella.

Second, the structure is sufficiently comprehensive to be able to capture new constructs. For example, beyond the focus on avoiding demands, Demerouti and Peeters (2018) recently introduced optimizing demands, which refers to optimization of work processes to make work more efficient. This corresponds with the approach demands crafting in the structure.

Third, this structure identifies a fundamental difference between approach and avoidance orientations to crafting, and cognitive/behavioural crafting, which we have suggested aggregate together to define job crafting, but they are not indicators of the same latent construct. We believe this way of understanding crafting helps us to get a better handle on the nature of these constructs. As an example, it helps us to resolve the debate as to whether crafting is proactive. Proactive behaviour is defined as self-directed and future-focused behaviour in which individuals aim to bring about change to the situation and/or within themselves (Parker, Bindl, & Strauss, 2010). As a behaviour, approach crafting fits into the above definition, and thus is a type of proactive behaviour (specifically, a type of

proactive person-environment fit behaviour; see Figure 3). However, whether avoidance crafting is proactive is not clear. Theoretically, avoidance crafting is assumed to involve active changes to one's job that one makes in order to avoid negative outcomes from occurring (Bruning & Campion, 2018; Tims & Bakker, 2010), which fits with the notion of proactive behaviour (defined as self-initiated, change-oriented and future-focused action, Parker et al., 2010). For example, a person might actively and intentionally avoid some sorts of tasks or activities in order to achieve a future-focused goal, such as when someone avoids tasks with too many demands in order to enable one to have resources to put into other more important aspects. However, empirical studies show findings contrary to this assumption. A meta-analysis (Rudolph et al., 2017) showed that proactive personality and self-efficacy, established antecedents of proactive behaviour (e.g., Parker et al., 2010), are negatively related to avoidance crafting. Empirical and meta-analytical studies have also supported the dysfunctional effects of avoiding hindering demands in short-term (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017) and long-term (Petrou, Demerouti, Schaufeli, 2015), which is inconsistent with the large body of evidence showing the value of proactive behaviour. To add to this confusion, another meta-analysis (Lichtenthaler & Fischbach, 2016a) showed a positive relationship between promotion focus and avoidance crafting. Altogether, although there is one study to the contrary, most empirical results challenge the notion that avoidance crafting is proactive.

How does one make sense of this complexity? In essence, whilst we agree that avoidance crafting can theoretically be proactive, especially when it is part of a broader goal and set of behaviours to consciously re-shape one's job over time, the way that this type of crafting has been operationalized does not necessarily capture this "active", crafting element. Indeed, most measures of avoidance crafting tend to include fairly simple withdrawal-oriented behaviours which are not very active, nor part of a deliberate crafting strategy in

which one withdraws from some tasks/activities in order to take on others. It is therefore unsurprising that avoidance crafting, as currently operationalized in most measures, appears to be quite passive. In the end, we assert that avoidance crafting can be proactive, but that we do not expect to see this reflected in empirical studies - unless there is a much stronger emphasis on measuring the active, crafting element of this behaviour rather than simple withdrawal.

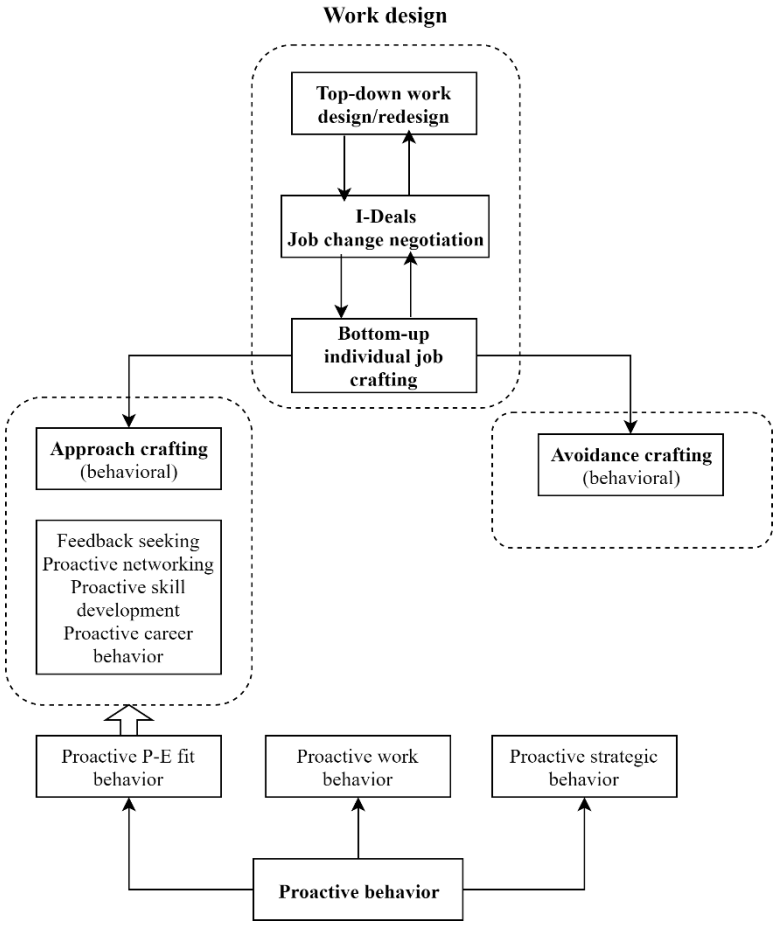


Figure 3: Job crafting and related concepts

Fourth, a final but important contribution of the hierarchical structure is that it helps to address several concerns with existing job crafting measures. Different versions of crafting measures exist in the literature, even within the same theoretical framework (see supplement Table 1). Measurement models can be mis-specified without consideration of aggregate/superordinate features of the job crafting construct. The dimensions of

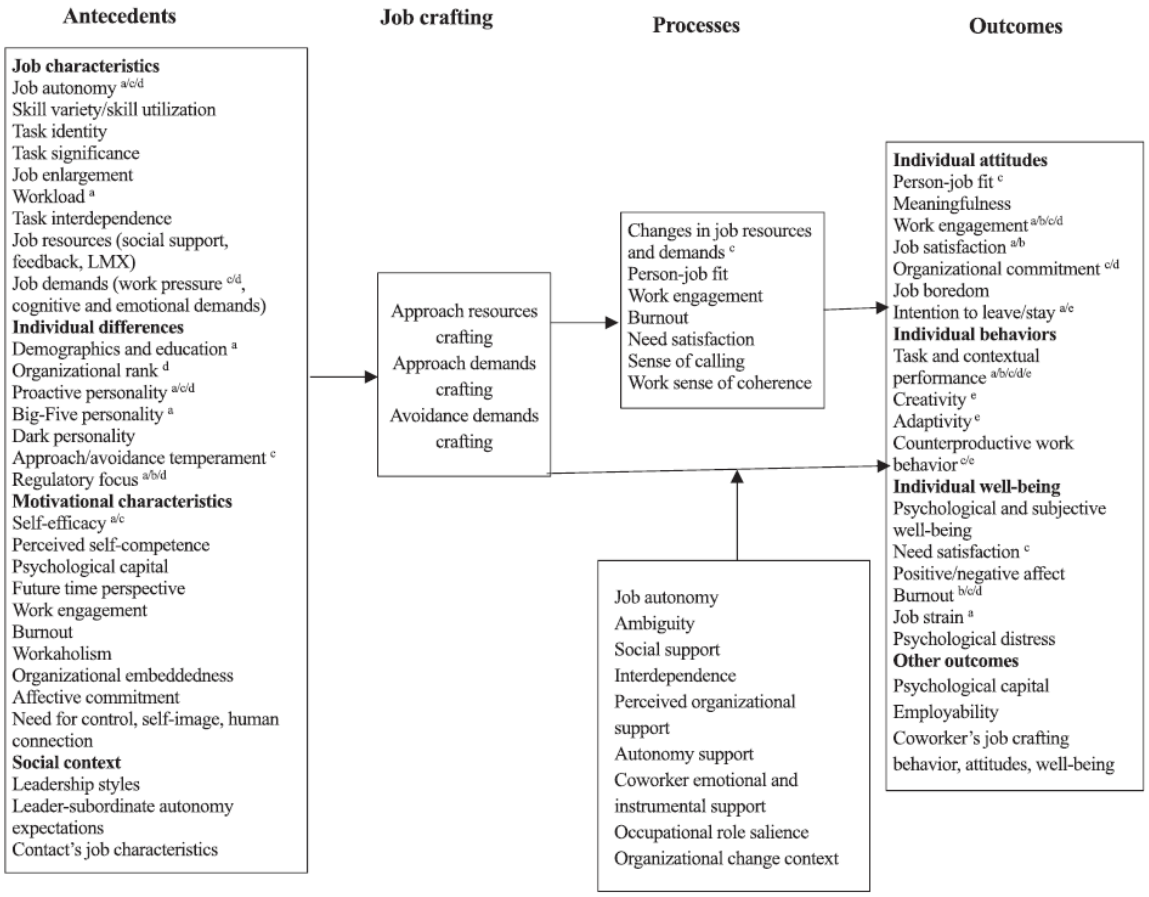
superordinate and aggregate constructs are analogous to reflective and formative measures respectively (MacKenzie et al., 2005). If scale development procedures recommended for constructs with reflective measures are applied to constructs with formative measures, the constructs' validity will be undermined (MacKenzie et al., 2005). Yet measures within the job demands–resources perspective tend to encompass increasing resources, increasing challenging demands, and reducing hindering demands, without consideration of the aggregate feature of approach crafting and avoidance crafting (Nielsen & Abildgaard, 2012; Nielsen, Antino, Sanz-Vergel, & Rodríguez-Muñoz, 2017; Tims et al., 2012; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012). Likewise, measures following Wrzesniewski and Dutton's (2001) framework typically consist of task, relational, and cognitive crafting (Niessen et al., 2016; Slemp & Vella-Brodrick, 2013; Weseler & Niessen, 2016), without consideration of the aggregate feature of behavioural crafting and cognitive crafting. Some empirical studies have used composite overall job crafting, the combination of approach crafting and avoidance crafting (e.g., Akkermans & Tims, 2017; Tims et al., 2016; Travaglianti, Babic, & Hansez, 2016; Tuan, 2018) or combination of behavioural crafting and cognitive crafting (e.g., Qi, Li, & Zhang, 2014; Sekiguchi, Li, & Hosomi, 2017), which is problematic for aggregate constructs. To be specific, at the least, crafting measures should distinguish between approach/avoidance and behavioural/cognitive dimensions and represent them properly as formative measures (Figure 1). Measures that include both approach items and avoidance items in the same dimension (Niessen et al., 2016), for instance, would be problematic. Similarly, measures with ambiguous items that could be interpreted in both approach and avoidance ways (e.g., changing the scope or types of tasks completed at work, Slemp & Vella-Brodrick, 2013) are also likely to create problems.

A final advantage of the hierarchical structure is that it provides a useful way to synthesize the antecedents and consequences of job crafting. We elaborate this point next,

reviewing the relevant literature as we go.

A Synthesized Nomological Network of Antecedents and Consequences of Job Crafting

Empirical studies have investigated antecedents and outcomes of job crafting, as quantitatively summarized in two meta-analyses (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017). However, the two meta-analyses have only included studies from the job demands–resources perspective. Our goal is to use our categorization of job crafting to synthesize the research findings from both perspectives. We review the literature primarily with respect to orientation (approach versus avoidance job crafting) because we see this as the most powerful way to distinguish types of job crafting. To include studies from Wrzesniewski and Dutton's (2001) perspective, we identify expansion-oriented crafting (task, relational and cognitive) as approach crafting, while contraction-oriented crafting (task, relational) as avoidance crafting (See Figure 2). We distinguish between the content of crafting (demands versus resources) where possible, with exceptions such as task crafting, which can be seen as both approach resources crafting and approach demands crafting. Crucially, in what follows, we focus almost exclusively on behavioural forms of crafting as there is little empirical evidence concerning cognitive crafting.



Note: a: Variables included in Rudolph et al. (2017);
b: Variables included in Lichtenthaler and Fischbach (2016a);
c: Variables included in Wang et al. (2016);
d: Variables included in Demerouti (2014);
e: Variables included in Lee & Lee (2018).

Figure 4: Individual level of job crafting research

Antecedents of approach crafting

Above, we argued that approach crafting is a type of proactive behaviour. Consequently, we draw on the model of proactive motivation (Parker et al., 2010) to review distal (individual differences, contextual variables) and motivational antecedents of approach crafting.

With regard to individual differences, as would be expected, individuals high in approach temperament and promotion-focus—who are people motivated to obtain positive end-states (Elliot & Thrash, 2002; Higgins, 1997)—tend to engage in more approach crafting (Bipp & Demerouti, 2015; Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017).

Unexpectedly, meta-analytic studies also found a weak yet positive relationship between prevention-focus and approach crafting (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017). This may be because individuals' regulatory focus is sensitive to contextual features, such as organizational climate and leader behaviour (Wallace & Chen, 2006), and individuals adopt a different regulatory-focus strategy temporarily, because of the situation. This finding also validates our suggestion that using the higher level of focus on approach versus avoidance, rather than the lower level of promotion versus prevention, is a more useful way to distinguish types of job crafting.

Stable individual differences such as Big Five personality and proactive personality predict proactive behaviour (e.g., Parker et al., 2010; Wu & Li, 2016). Consistent with this proactivity research, Rudolph et al.'s (2017) meta-analysis found that the proactive personality, extraversion, conscientiousness and openness dimensions of the Big Five were positively related to approach crafting. With respect to the other two Big Five dimensions, the results are not quite consistent with proactivity research (Wu & Li, 2016), whereas a job crafting meta-analysis showed that agreeableness was positively related to approach crafting, and neuroticism was negatively related to approach resources crafting (Rudolph et al., 2017). In the case of the former, agreeable individuals are likely to build and maintain social relationships, which might help them to achieve effective approach resources crafting, and the high negative affect experienced by individuals high in neuroticism perhaps hinders their opportunity-seeking behaviours.

Proactivity literature has indicated other individual differences related to proactive behaviour, such as desire for control and consideration of the future (Parker et al., 2010). Similarly, in the crafting literature, one study found that individuals who have open-ended future time perspectives were more likely to engage in approach crafting one year later (Kooij, Tims, & Akkermans, 2017). As those people have long-term goals and focus on

growth, approach crafting is a way for them to increase development opportunities. However, job crafting research has not found a positive relationship between need for control and approach crafting (Niessen et al., 2016), which is somewhat surprising.

With regard to demographic and employment characteristics, Rudolph et al. (2017) found that age and tenure were negatively related to approach crafting, perhaps because older workers with longer organizational tenure already have higher job satisfaction and more favourable attitudes toward job characteristics (Ng & Feldman, 2010). Women reported more approach resources crafting than men, with small but significant differences (Rudolph et al., 2017). Lin, Law and Zhou (2017) found an inverted U-shaped relationship between underemployment and approach crafting (i.e., task crafting), which is moderated by organizational identification.

Like all other work behaviours, proactive behaviour is shaped not only by who a person is, but also by the work context, such as work design and leadership, usually through enhancing an individual's motivational states (Parker et al., 2010). For example, high commitment human resource management, which includes practices such as extensive training, empowerment, participation in decision-making, has been indicated to positively related to approach crafting (Meijerink, Bos-Nehles, & de Leede, 2018). Similarly, empirical and meta-analytic studies have found a positive relationship between approach crafting and good work design, which includes features such as job autonomy (Kim, Im, & Qu, 2018; Rudolph et al., 2017), job enlargement (Berdicchia, Nicolli, & Masino, 2016), opportunity for professional development (Nipper, van Wingerden, & Poell, 2018), task identity, task significance (Kim & Lee, 2016), feedback, social support, leader–member exchange (Berdicchia & Masino, 2017; Gordon, Demerouti, Le Blanc, & Bipp, 2015; Radstaak & Hennes, 2017), and skill utilization (Cullinane, Bosak, Flood, & Demerouti, 2017). In addition, Cullinane et al. (2017) indicated that the positive relationship between daily skill

utilization and approach resources crafting was stronger when employees had high boundary control and low task interdependence in their general roles. The moderating role of interdependence may be because individuals perceive less freedom to craft in highly interdependent environments (Tims et al., 2010; Wrzesniewski & Dutton, 2001), although studies have also reported non-significant main effects of task interdependence on approach crafting (Leana et al., 2009; Niessen et al., 2016). It is worth noting that the above studies are cross-sectional, therefore no causal relationships can be derived, a point we return to later.

When it comes to the relationship of "negative" job characteristics, such as excess job demands, with approach crafting, the results are complex and mixed. From a control theory perspective, job stressors are perceived as a deviation between actual and desired situations, which can motivate individuals to take a proactive approach to decrease the discrepancy (Carver & Scheier, 1982). Consistent with this notion, Rudolph et al. (2017) found that workload, usually recognized as a "challenging demand" (that is, an obstacle to be overcome in order to learn and achieve, LePine, Podsakoff, & LePine, 2005), was positively related to approach crafting. Similarly, Gordon et al. (2015) found positive relationships between approach resources crafting and job demands (work pressure, cognitive demands, and emotional demands). However, Solberg and Wong (2016) demonstrated a negative relationship between perceived role overload and approach crafting (i.e., task crafting), perhaps because role overload is one type of "hindrance demands," which are likely to thwart personal growth and goal attainment (LePine et al., 2005) and thus reduce approach crafting.

Another important context factor that affects individual proactive behaviour is leadership. Some empirical studies have found a positive role of employee-oriented leadership (Lichtenthaler & Fischbach, 2018), empowering leadership (Esteves & Lopes, 2017a; Kim & Beehr, 2018; Thun & Bakker, 2018) and servant leadership (Bavik, Bavik, & Tang, 2017; Harju, Schaufeli, Hakanen, 2018; Yang, Ming, Ma, & Huo, 2017) in shaping

employee approach crafting. Those leaders give autonomy to employees and encourage employees to pursue long-term goals, thereby promoting employees' motivation to craft. In addition, the relationship between empowering leadership and approach crafting was stronger for employees high in optimism (Thun & Bakker, 2018). The results of transformational leadership and approach crafting are mixed, with some indicating a positive relationship at the interpersonal level (Wang, Demerouti, and Le Blanc, 2017) and intrapersonal level (Hetland, Hetland, Bakker, & Demerouti, 2018), and another study indicating a non-significant relationship (Esteves & Lopes, 2017a). This may be because the effect of leadership on approach crafting also depends on follower individual differences such as trait promotion focus (Hetland et al., 2018) and adaptivity (Wang et al., 2017). Unexpectedly, Esteves and Lopes (2017a) found that directive leadership was positively related to employees' approach crafting (specifically, crafting social resources), which might be because the monitoring characteristics of directive leadership drive employees to seek feedback. Wong, Škerlavaj, and Černe (2017) showed that subordinates who share similar levels of autonomy expectations with their leaders tended to perceive better competency utilization, which in turn led to more approach crafting. This mediation effect was further moderated by the leader's use of coalition influence tactics, where the mediated relationship was stronger under a leader's high use of such tactics. Tuan (2018) investigated the role of paternalistic leadership, a predominant leadership in Oriental cultures, in affecting job crafting. However, they used the composite score of approach and avoidance crafting, which precludes understanding of the effect on approach crafting and avoidance crafting separately.

Drawing on role theory and social network research, Bizzi (2017) proposed that work contacts' job characteristics also influence individuals' job crafting through the explicit or implicit expectations sent to the job incumbent. Results showed that after controlling for individuals' own job characteristics, work contacts' job autonomy and feedback positively

affected individuals' approach crafting, whereas contacts' task significance had a negative effect. The authors reasoned that when contacts have high autonomy and clear feedback, incumbents' work is independent and decided by themselves, thus they have low interest in inhibiting the crafting of others; however, when contacts have high task significance, contacts see their work as important, which might lead them to impinge on the incumbents' crafting.

Beyond distal antecedents, researchers have also investigated the effects of proximal motivational factors on approach crafting, including the "can do," "reason to," and "energized to" proactive motivation states studied in the proactivity literature. Can do motivation relates to individuals' perceptions of self-efficacy and agency; reason to motivation relates to why someone is proactive, such as one's autonomous forms of motivation or the sense of being compelled through controlled motivation; and energized to motivation refers to activated positive affect states (Parker et al., 2010). Consistent with the proactivity literature, meta-analytical and empirical studies showed that general self-efficacy and core self-evaluation, the "can do" motivational state, was positively related to approach crafting (Rudolph et al., 2017; Tims & Akkermans, 2017). With regard to reason to motivation states, Qi, Li, and Zhang (2014) reported that organizational embeddedness and affective commitment were both positively related to approach crafting, especially when internal social capital was low. Similarly, Moon, Youn, Hur and Kim (2018) found that employees' spirituality at work, which enables employees to assign meaning to their work experiences, was positively related to approach crafting through increased intrinsic work motivation. For energized to motivation, several empirical studies have found positive relationships between work engagement, an activated positive affect, and approach crafting after 1 month (Tims, Bakker, & Derks, 2015a), 3 months (Lu et al., 2014; Zeijen, Peeters, & Hakanen, 2018), 3 years (Harju, Hakanen, & Schaufeli, 2016), and 4 years (Hakanen, Peeters, & Schaufeli, 2018). Similar to work engagement, workaholism involves feelings of absorption in one's work, and

is positively related to approach crafting, although the motivation of workaholism is compulsive rather than intrinsic (Hakanen et al., 2018; Zeijen et al., 2018). Furthermore, drawing on self-regulation theory, Zeijen et al. (2018) found that work engagement is positively related to approach crafting through self-observation and self-goal setting, while workaholism only through self-goal setting. The absence of self-observing behaviour prevents workaholics from assessing what a healthy and desirable situation requires. Finally, burnout, a low-activation form of negative affect, appears related to lower approach crafting, and job satisfaction, as a low-activation form of positive affect, is unrelated to approach crafting (Hakanen et al., 2018).

Overall, research on the antecedents of types of behavioural approach crafting reveals very similar antecedents to those identified in the wider proactivity literature, as would be expected. In terms of more subtle distinctions among antecedents of different types of approach crafting constructs, although approach resources crafting and approach demands crafting share most of the same antecedents, some antecedents, notably neuroticism, job demands, burnout, and directive leadership, are associated with approach resources crafting but not approach demands crafting (see Table 1). This result suggests maintaining the distinction between resources and demands.

Antecedents of avoidance crafting

Given our argument that avoidance crafting is less proactive, it is not surprising that most variables predicting approach crafting are also related to avoidance crafting, but in the opposite direction. More specifically, studies have shown that proactive personality, conscientiousness, openness, work engagement, and job autonomy are negatively related to avoidance demands crafting, while prevention focus, neuroticism, and burnout are positively associated with avoidance demands crafting (Hakanen et al., 2018; Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017).

Nevertheless, some variables show patterns that are not simply the opposite of the relationships observed for approach crafting. For instance, agreeableness, promotion focus, prevention focus, and directive leadership were both positively related to approach crafting and to avoidance demands crafting (Esteves & Lopes, 2017a; Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017). It is surprising that agreeable individuals are likely to reduce demands because avoidance demands crafting can cause conflicts among co-workers (Tims, Bakker, & Derks, 2015b). It is assumed that job autonomy is positively related to all types of job crafting, but Rudolph et al. (2017) found that higher job autonomy was associated with less avoidance demands crafting. It seems that job autonomy enhances individuals' motivation and goal-oriented behaviours, thus preventing avoidance and withdrawal behaviours (Bakker & Demerouti, 2007).

Outcomes of approach crafting

Much evidence shows that good work design predicts an array of positive individual and organizational outcomes, such as commitment, satisfaction, internal work motivation, employee well-being, and performance (Bakker & Demerouti, 2007; Humphrey, Nahrgang, & Morgeson, 2007; Parker et al., 2017). Consistent with what would therefore be expected, studies show that approach crafting benefits individual well-being, such as work engagement (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017), job satisfaction (Cheng, Chen, Teng, & Yen, 2016; Lichtenthaler & Fischbach, 2016a; Slemp, Kern, & Vella-Brodrick, 2015; Rudolph et al., 2017), psychological and subjective well-being (Slemp & Vella-Brodrick, 2014), and positive affect (Slemp et al., 2015), and prevents individual negative well-being, such as burnout (Cheng & O-Yang, 2018; Tims et al., 2013), job boredom (Harju et al., 2016, 2018), physical complaints, depression (Kim & Beehr, 2018) and job strain (Rudolph et al., 2017). Approach crafting also benefits individuals' career, presumably because employees are able to develop their personal resources through increased learning opportunities or to

translate already existing resources into other valuable assets (Kira, Eijnatten, & Balkin, 2010). Empirical studies have supported that approach crafting predicts one's perceived employability (Brenninkmeijer & Hekkert-Koning, 2015), career competence (Akkermans & Tims, 2017), career satisfaction and commitment (Kim & Beehr, 2018) and objective promotions (Cenciotti, Alessandri, & Borgogni, 2017).

Although it is assumed that job crafting aims to benefit individuals themselves, approach crafting has also been found to benefit organizations because it is negatively related to turnover intentions (Esteves & Lopes, 2017b; Rudolph et al., 2017) and positively related to higher level of intention to stay (Rofcanin, Berber, Koch, & Sevinc, 2016), organizational commitment (Cheng et al., 2016; Rofcanin et al., 2016; Wang, Demerouti, Le Blanc, & Lu, 2018), and enhanced motivation to continue working beyond retirement age among older workers (Lichtenthaler & Fischbach, 2016b). With enhanced person–job fit and motivation as a result of approach crafting, it is not surprising that approach crafting is also associated with higher levels of task and contextual performance (Lichtenthaler & Fischbach, 2016a; Rofcanin et al., 2018; Rudolph et al., 2017).

Job crafting is assumed to happen without the involvement of co-workers, but empirical studies have indicated the positive effect of individual approach crafting on co-workers. Specifically, Bakker, Rodríguez-Muñoz, and Sanz Vergel (2016) indicated that employees observed and imitated their co-workers' crafting behaviour. Actor approach crafting was also positively related to co-worker work engagement via the co-worker's approach crafting. Similarly, at the day level, Peeters, Arts, and Demerouti (2016) found a direct crossover of approach demands crafting from actor to co-worker. Actor approach resources crafting only transferred to co-workers when the co-worker was high in empathic concern, perhaps because crafting resources is a social activity, and individuals are more likely to influence others' approach resources crafting when they are emotionally close to

them.

With abundant evidence of positive effects of approach crafting, research has investigated the mechanisms of approach crafting to outcomes, such as changes in work design, person-job fit and enhanced motivation, as proposed in job crafting theory (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). Specifically, empirical studies supported the mediating role of changes in job resources and person-job fit in predicting employee well-being (Chen, Yen, & Tsai, 2014; Demerouti, Bakker, & Halbesleben, 2015; Tims, Bakker, & Derks, 2013, 2016) and task performance (Demerouti et al., 2015). A job crafting meta-analysis showed that work engagement mediated the positive relationship of approach crafting with employee performance and job satisfaction (Lichtenthaler & Fischbach, 2016a).

Relatively few studies have investigated the boundary conditions of approach crafting to outcomes. As not all employees are motivated to craft their jobs (Wrzesniewski & Dutton, 2001), Petrou, Bakker, and van den Heuvel (2017) found that individuals with high occupational role salience tend to create jobs in which they are enthusiastic and are able to seek meaning. Thus, occupational role salience moderated the positive relationship of approach crafting with work engagement and meaning-making. Employees' motivation to craft their job also influence the effect of crafting. Rofcanin et al. (2018) indicated that the positive relationship of approach resources crafting (i.e., expansion-oriented relational crafting) and work engagement was stronger for employees with lower impression management motives. In addition, research indicated that approach crafting might be more beneficial to employees who experience rough times, such that the positive relationship between approach crafting and work attachment was stronger for employees who were rated as poor performers or felt job insecurity (Wang et al., 2018). Consistent with proactivity research, studies also found that contextual factors such as perceived organizational support (Cheng et al., 2016; Cheng & O-Yang, 2018) and autonomy support (Slemp et al., 2015)

reinforced the relationship between approach crafting and employee well-being. Shin, Hur, and Choi (2018) found different moderating effect of co-worker support. Specifically, the positive relationship between approach crafting and work engagement was stronger when co-worker emotional support was high and instrumental support was low. In addition, approach crafting not only led to positive outcomes, but also buffered the negative effects of job demands (Hakanen, Seppälä, & Peeters, 2017) and of value incongruence (Vogel, Rodell, & Lynch, 2016) on employee work engagement and job performance.

Overall, empirical studies suggest that approach crafting leads to better well-being and performance, with some slightly different results according to whether the crafting focuses on resources or demands. Demerouti, Bakker, and Gevers (2015) found that approach demands crafting did not show additional value in predicting employee work engagement and creativity over approach resources crafting. By contrast, in longitudinal studies, approach demands crafting has been indicated to be more effective than approach resources crafting for promoting employee work engagement and reducing job boredom (Harju et al., 2016), for predicting current and subsequent adaptivity (Petrou, Demerouti, & Schaufeli, 2018), and for preventing exhaustion (Petrou, Demerouti, & Schaufeli, 2015) during organizational changes. This may be because approach resources crafting involves meeting short-term needs and therefore the benefits of the resources are short-lived, whereas approach demands crafting (such as taking on extra tasks) only yields more long-term benefits (Harju et al., 2016). Beyond individual outcomes, Peeters et al. (2016) found that only daily approach resources crafting was positively associated with both self-rated and other-rated team member adaptivity, possibly because as an interpersonal strategy, approach resources crafting may better support the changes that affect employees' roles as team members. Counterintuitively, Demerouti, Bakker, and Halbesleben (2015) found that daily approach demands crafting was positively related to counterproductive work behaviour, which, as an isolated set of findings

contrary to hypotheses, requires further testing.

Outcomes of avoidance crafting

Avoidance demands crafting has theoretically been assumed to be an effective strategy for employees to cope with excessive job demands and, as such, should be beneficial for well-being (Tims & Bakker, 2010; Tims et al., 2013). However, empirical studies have demonstrated a detrimental role of avoidance demands crafting, including being negatively related to work engagement and job satisfaction (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017), and being positively related to job strain (Rudolph et al., 2017). Beyond cross-sectional results, Petrou et al. (2015) found that avoidance demands crafting was reciprocally related with exhaustion over time. This suggests a vicious circle in which exhausted employees avoid demands, which then increases their workload and intensifies their exhaustion. Avoidance demands crafting also means employees refrain from fulfilling their role requirements, which impairs their performance (Demerouti et al., 2015). Supporting this idea, meta-analytic studies have found that avoidance demands crafting is negatively related to individual performance (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017) and positively related to turnover intentions (Rudolph et al., 2017). The vast majority of studies indicated negative effects of avoidance crafting. Very rarely, Rastogi and Chaudhary (2018) found that avoidance demands crafting was positively related to work engagement and work-home enrichment, which suggests the effect of avoidance crafting requires further investigation.

Avoidance demands crafting has also been indicated to negatively influence one's co-workers. In a study of dyads, Bakker et al. (2016) theorized and found that actor avoidance demands crafting was associated with lower co-worker work engagement, without any mediating role of co-worker avoidance demands crafting. Tims et al. (2015b) showed that when employees engaged in avoidance demands crafting, their colleagues reported more

conflict and higher levels of workload and burnout. Results showed that actor workload was related to both actor and co-worker disengagement. It may be that burned-out employees have negative job attitudes and behaviours, and their colleagues then "catch" these negative attitudes via a contagion process.

Altogether, studies suggest that employees may be unsuccessful in reducing their job demands when they engage in avoidance demands crafting (Tims et al., 2013). Indeed, even if this crafting strategy is effective, it leads only to the absence of negative outcomes rather than to positive outcomes. A focus on negative outcomes—even on avoiding them—can bring strain to individuals and impair their well-being (Elliot, 2006). In addition, when individuals engage in avoidance demands crafting, they can reduce the optimal level of job challenges (Petrou et al., 2012), thereby missing positive opportunities for growth and development (Elliot, 2006).

Above, we reviewed the antecedents and outcomes of behavioural forms of crafting because this has been the focus of the vast bulk of crafting research. In the rare empirical studies focused on cognitive crafting, Kim et al. (2018) found that autonomy, perceived organizational support and creative self-efficacy were positively related to approach crafting (cognitive), which is similar to results on behavioural types of approach crafting. With regard to the outcomes, approach crafting (cognitive) was positively related to employee needs-supplies fit (Niessen et al., 2016), job satisfaction (Kim et al., 2018) and well-being (Slemp & Vella-Brodrick, 2014), but not to task performance (Weseler & Niessen, 2016).

Table 1: Antecedents and outcomes of approach crafting and avoidance crafting

Antecedents	Approach resources crafting	Approach demands crafting	Avoidance demands crafting
Proactive personality	+	+	-
Promotion focus	+	+	+/0
Prevention focus	+	+	+
Extraversion	+	+	0
Openness	+	+	-
Conscientiousness	+	+	-

Agreeableness	+	+	+
Neuroticism	-	0	+
Self-efficacy	+	+	0
Job autonomy	+	+	-
Workload	+	+	0
Job resources	+	+	-
work pressure, cognitive/emotional demands	+	0	0
Perceived role overload	-	-	N/A
Psychological capital	+	+	0
Open-ended future time perspective	+	+	0
Servant leadership	+	+	N/A
Empowering leadership	+	+	0
Transformational leadership	+/0	+/0	0
Directive leadership	+	0	0
Work engagement	+	+	-
Burnout	-	0	+
Organizational embeddedness	+	+	N/A
Affective commitment	+	+	N/A

Outcomes	Approach resources crafting	Approach demands crafting	Avoidance demands crafting
Work engagement	+	+	-
Burnout	-	-	+
Job satisfaction	+	+	-
Turnover intentions	-	-	+
Job performance	+	+	-
Job strain	-	-	+
Person-job fit	+	+	N/A
Meaningfulness	+	+	N/A
Psychological well-being	+	+	N/A
Positive affect	+	+	N/A
Negative affect	-	-	N/A
Psychological distress	-	0	+
Job boredom	0	-	N/A
Employability	+	0	-
Individual adaptivity	0	+	0
Team member adaptivity	+	+	N/A
Creativity	+	0	-

Note: +: positive relationship; -: negative relationship; 0: non-significant relationship.

Variables in italics are included in meta-analyses (Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017)

Implications and Future Directions

Much research has defined, theorized about, and investigated job crafting, but confusion exists in the literature, and the two dominant theoretical frameworks of job crafting remain separate. In this review, we synthesized the many different types of crafting by identifying three overarching aspects (orientation, form, and content) and combining these

into an integrated hierarchical structure. Here we discuss how our review contributes to the literature and we propose a road map for future research.

We highlighted how crafting orientation, the approach-oriented versus avoidance-oriented crafting, is a critical distinguishing aspect (and is more useful than a prevention versus promotion distinction), with approach crafting being very similar in how it functions to proactive behaviour, whereas avoidance crafting being less proactive in existing empirical studies. Our review suggests the aggregate feature of approach and avoidance crafting which, in turn, means we warn against models and measures of crafting that treat different orientations of crafting interchangeably. We strongly recommend against using composite job crafting, in which approach and avoidance crafting are combined into an overall score.

We further noted that crafting can be behavioural or cognitive in form, although there is surprisingly little research on cognitive crafting, with most studies to date questioning whether cognitive crafting is, in fact, crafting. Within the rare empirical studies, approach crafting (cognitive) appears to benefit attitudes, likely because it changes individuals' perceptions, but cognitive crafting might need to translate into actual behaviour in order for it to benefit performance (Weseler & Niessen, 2016). Cognitive crafting might also be more advantageous in very rigid and constrained jobs where there is little opportunity for behavioural crafting. In addition, some job characteristics, such as task significance and task identity, are likely to be much easier to change through cognitive crafting than other job characteristics, such as task variety. More research on cognitive crafting is certainly warranted.

With respect to the content of crafting, we concurred with those scholars who have identified value in distinguishing between crafting resources and crafting demands. However, unlike the above distinctions, we argued that these are superordinate components of job crafting as they are highly correlated and share similar antecedents and outcomes.

Next, we discuss some more specific implications and directions based on our review.

New crafting types

One implication of the hierarchical structure is that it has identified a type of crafting that is entirely plausible yet has received almost no attention to date: avoidance resource crafting, in which employees step away from tasks or roles that lack job resources. An example of this type of crafting might be stepping away from tasks low in autonomy. A further contribution of the hierarchical structure is that, with regard to demands crafting, existing research has predominantly focused on avoiding hindering demands. However, we argue that hindering demands can be crafted in an approach-oriented way. In other words, individuals can actively try to address hindering demands. Consistent with this reasoning, Demerouti and Peeters (2018) recently showed that optimizing demands was positively related to work engagement. This latter finding is very different from the bulk of the literature which has focused on avoidant types of demands crafting and, consequently, has shown largely negative outcomes.

How aspects of crafting interrelate

One area worth investigating further is the potential for dynamic interrelationships among different types of job crafting. It can be inferred from existing empirical findings that approach crafting and avoidance crafting are negatively related across persons, but perhaps at the intrapersonal level, there are dynamic associations, such as when an individual is unsuccessful or blocked in their approach crafting and then becomes avoidant. According to conservation of resources theory (Hobfoll, 1989), approach resources crafting and approach demands crafting are likely to positively contribute to each other. For instance, Harju et al. (2016) found that approach demands crafting fueled approach resources crafting, which in turn predicted more approach demands crafting. As we have already discussed, cognitive crafting and behavioural crafting are probably reciprocally related.

Measurement of job crafting

With the clarified conceptualization of job crafting, we suggest an important next step is to improve the measures. With regard to existing measures, we encourage scholars to investigate how measures from the different frameworks are interrelated, and indeed whether they can be attributed to higher-order dimensions as we proposed here. We strongly recommend that scholars test approach and avoidance crafting, or cognitive and behavioural crafting, as aggregate multidimensional constructs and apply the formative measurement model. Indeed, having realized the difference between approach crafting and avoidance crafting, some scholars excluded the avoidance demands crafting dimension (i.e., decreasing hindering demands) from their studies (e.g., Cenciotti et al., 2017; Cullinane et al., 2017; Petrou et al, 2017). Another direction for measurement is to develop measures of the new types of crafting we identified.

More specifically, with regard to the dimension of job content, existing measures are limited in their coverage of job characteristics. We do not suggest including all job characteristics in one measure, which is impossible, but we recommend that researchers focus on those work characteristics that have been shown to be important in meta-analyses predicting attitudes and behaviours. For example, job autonomy, task variety, and skill variety are important motivational job characteristics; and task interdependence, social support, and feedback from others are important social job characteristics (Humphrey et al., 2007). We also recommend researchers measure those job characteristics that are most relevant to the context. For example, skill variety and specialization are examples of job crafting content that have been neglected, yet are likely to be highly relevant for knowledge workers. As a final small point, although some measures cover important job characteristics such as job autonomy and skill use, the items (e.g., “I decide on my own how I do things” and “I try to learn new things at work,” Tims et al., 2012) seem to reflect general autonomy and skill

utilization rather than engagement in crafting more autonomy or more development opportunities. We recommend items that are appropriately specific such as “I actively seek out job tasks in which I can learn new things at work.”

Antecedents of job crafting

Beyond measurement, we propose that future research seek to uncover the complex mechanisms of how approach crafting and avoidance crafting are shaped and stimulated. A relevant question, given our focus on trying to bring the literature together, concerns whether there are variables that predict all types of job crafting (including approach and avoidance types) in the same direction. We propose that person-job misfit might be one such predictor (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001), yet it has not been investigated.

Rather than investigating more antecedents, a potentially insightful direction for future research is to explore the interactive effects of individual and contextual factors. For example, there could be interactive effects of different job characteristics. Petrou et al.’s (2012) diary study indicated that daily work pressure was positively related to avoidance demands crafting, but when combined with high job autonomy, daily work pressure was positively related to approach resources crafting. However, this might only be true for individuals with a proactive personality as such people respond positively to active jobs (Parker et al., 2010). Furthermore, dispositions and work-related cues can compensate each other. For instance, job crafting also exists in low-control jobs (McClelland, Leach, Clegg, & McGowan, 2014), which may be because strong dispositions such as proactive personality and self-efficacy compensate for the weak situation. Indeed, Berdicchia et al. (2016) found that the relationship between job enlargement and approach resources crafting was weaker for individuals with high self-competency. This might be because those people felt a lesser need for support to complete their job. Solberg and Wong (2016) also found an interactive effect of leadership and individual disposition. They found the relationship between perceived role

overload and approach crafting became positive when employees' perceived adaptivity was high and their leaders' need for structure was low.

The two job crafting theories propose that individuals engage in job crafting for different reasons (e.g., seeking meaning or person–job fit, Tims et al., 2012; Wrzesniewski & Dutton, 2001). However, little research has explicitly investigated the reasons or aims as to why employees use different job crafting types. Responding to the call for investigation of job crafting motives, strengths, and passions (Berg et al., 2013), Kooij, van Woerkom, Wilkenloh, Dorenbosch, and Denissen (2017) introduced two types of job crafting that incorporate motives: crafting toward strengths and crafting toward interests. They found that these two types of job crafting positively correlated with person-job fit.

With regard to the antecedents of avoidance crafting, we applaud efforts to integrate regulatory focus theory and goal orientation theory into job crafting theory (Bruning & Campion, 2018; Lichtenthaler & Fischbach, 2016a). However, more contextual and motivational antecedents beyond individual dispositions need to be investigated. For instance, avoidance demands crafting due to exhaustion or lack of motivation might influence how individuals use this strategy and other job crafting tactics. In addition, one person's challenge demand might be another person's hindrance demand. Research has indicated that challenge appraisal led to positive emotion and problem-focused coping, whereas hindrance appraisal led to negative emotion, emotion-focused coping and withdrawal behaviour (Searle and Auton, 2015). It is therefore necessary to consider individual appraisals as antecedents (Lepine et al., 2005).

Outcomes of job crafting

As job crafting is viewed as a bottom-up approach to work design, to explain outcomes of job crafting, researchers have predominantly drawn on work design theory, specifically job demands-resources theory (Bakker & Demerouti, 2007). It is assumed that when individuals

approach job resources and challenges, their motivation is enhanced, which in turn leads to positive outcomes. Although rarer in the literature, some scholars have also drawn on other theories such as person-job fit theory (Kristof-Brown, Zimmerman, & Johnson, 2005), conservation of resources theory (Hobfoll, 1989), and self-determination theory (Ryan & Deci, 2000) to explain the mechanisms of approach crafting.

However, these theories are limited when it comes to explaining the detrimental effects of avoiding hindering demands. Although avoidance goal regulation (Elliot, 2006) is a useful theory here, we call for scholars to further investigate the negative effects of avoidance crafting and progress theory development in this respect. Another way to better understand avoidance demands crafting is a person-centred approach, which depicts how different subgroups use all job crafting strategies simultaneously. Mäkikangas (2018) investigated participants' day-level job crafting and found two different job crafting profiles: active job crafters who scored high on all job crafting dimensions and passive job crafters who scored low on all job crafting dimensions. Active job crafters reported higher work engagement than passive job crafters, indicating that when combined with other approach crafting strategies, avoidance demands crafting is less detrimental. Nevertheless, the profiles require further validation with different samples and situations.

Wrzesniewski and Dutton (2001) indicated that job crafting is not inherently good or bad for organizations, but little research has been done on the dysfunctional consequences of approach crafting. Dierdorff and Jessen (2018) found a U-shaped relationship between overall crafting and performance-related outcomes (proficiency and citizenship behaviour) but not with work-related attitudes, such that moderate levels of crafting show dysfunctional effects on performance that then become functional at higher levels of crafting. According to role theory, when job crafting behaviours became moderate enough to be noticed, managers and co-workers may at first hold negative attitudes toward such actions. However, when a

higher level of crafting is more visible to others, individuals can take repeated feedback from other members and adjust their behaviours, which makes job crafting behaviours more functional. It is worth noting that with regard to distinct job crafting dimensions, these authors (Dierdorff & Jessen, 2018) failed to find significant curvilinear relationships between avoidance demands crafting (i.e., decreasing hindering demands) and performance outcomes, which again supports our distinction between approach and avoidance crafting.

Boundary conditions of job crafting

More research is needed to understand boundary conditions of job crafting, one of which is the work context. As a contextually embedded phenomenon, both job crafting actions and outcomes are shaped by features of work context. Dierdorff and Jessen (2018) found that task context (job autonomy and ambiguity) and social context (social support) buffered the dysfunctional effects of job crafting. Similarly, Wang, Wang and Li (2018) found that approach crafting is positively related to leader-member exchange when participative decision-making is high, but is negatively related to leader-member exchange when participative decision-making is low. Participative decision-making influenced whether employees align their goals with the interests of their supervisor and organization, which in turn affects the quality of leader-member exchange. As job crafting behaviours may or may not be integrated well with organizational functioning, it would also be helpful to investigate how managers and co-workers' responses affect the exertion of job crafting.

Another interesting boundary condition is culture differences. Although the positive effects of approach crafting and the negative effects of avoidance crafting have been supported in different cultural backgrounds, several studies have indicated that cultural differences influence individuals' job crafting behaviour as well as the outcomes of job crafting. Gordon et al. (2015) compared the job crafting of health care professionals in the US (a masculine-dominated culture) and the Netherlands (a feminine-dominated culture),

indicating that the former have higher job demands and report more avoidance demands crafting, whereas the latter reported a higher level of approach resources crafting. Yepes-Baldó, Romeo, Westerberg, and Nordin (2018) found a positive linear relationship between approach crafting and psychological well-being in a Spanish sample, but found an inverted U-shaped curve between approach crafting and psychological well-being in the Swedish sample. Petrou, Demerouti, and Xanthopoulou (2017) further examined the effects of approach crafting on employee occupational well-being in two different organizational change contexts: one was regular organizational change aiming for better organizational functioning (Dutch sample), and the other was cutback-related organizational change due to the financial recession (Greek sample). More specifically, they found that approach resources crafting was negatively related to exhaustion for Dutch employees but not for Greek employees. All of these studies, however, must be considered preliminary, especially as studies that compare only two national cultures are generally considered inadequate for proper cross-cultural comparisons.

Methodological issues of job crafting

Existing empirical studies are predominantly cross-sectional and thus cannot draw causal conclusions. Even within the several longitudinal studies (Cenciotti et al., 2017; Harju et al., 2016; Lu et al., 2014), there have been very few three-wave full panel designs (e.g., Vogt, Hakanen, Brauchli, Jenny, & Bauer, 2016). Longitudinal studies will allow examination of the dynamic relationships of job crafting with other variables, such as job characteristics, motivational factors and personal resources. Many studies have investigated job characteristics as antecedents of job crafting (e.g., Lichtenthaler & Fischbach, 2016a; Rudolph et al., 2017), but because job crafting is defined as changes employees make to their jobs, job characteristics are potential outcomes of job crafting. When job characteristics are assessed using employees' perceptions, although acknowledged as a valid approach (Daniels,

2006), it is likely to reflect some crafting. Longitudinal research designs with at least three waves of data collection and suitable statistics are vital for unpacking this causal complexity (Ployhart & Vandenberg, 2010). Thus, although Cenciotti et al. (2017) conducted a two-wave study and indicated a reciprocal relationship between job crafting and psychological capital, in their three-wave study, Vogt et al. (2016) found that approach crafting predicted psychological capital and work engagement, but not vice versa.

Longitudinal designs also help to investigate the effect of job crafting over time. From a differentiated job demands-resources model, both challenging and hindering job demands activate an energy depletion process and lead to burnout (Crawford et al., 2010). A long-term exposure to high job demands, even challenging demands, may build up strain and cause depletion in the long run (Petrou et al., 2012). Future research might investigate whether approach demands crafting will impair individuals' well-being in the long run. A critical concern of any such longitudinal design is the optimal time lag. Existing longitudinal research has been conducted on a week level (Tims et al., 2016), month level (Tims et al., 2013), and year level (Cenciotti et al., 2017; Vogt et al., 2016). Researchers should use pilot studies with quite short lags to design an optimally spaced panel design (Dormann & Griffin, 2015).

Job crafting study designs have also been limited to field surveys with just a few exceptions of studies with experimental designs (Bipp & Demerouti, 2015; Lin, Law, & Zhou, 2017). Expanding the use of scenario and laboratory designs will benefit job crafting research, perhaps especially to investigate avoidance demands crafting, which participants might be reluctant to report in field surveys (Tims et al., 2013).

Team-level job crafting

A final point is that team-level job crafting needs more consideration. Leana et al. (2009) defined job crafting as the joint efforts of team members to decide how to alter the

work to meet their shared work goals. Such team job crafting involves dyads or group of employees working together to make physical and cognitive changes in the task and relational boundaries of their work (Leana et al., 2009). Applying the job demands–resources model, Tims, Bakker, Derks, and Van Rhenen (2013) defined collaborative job crafting as the extent to which team members combine efforts to change their job resources and job demands. Future research should attempt to better understand these two types of collaborative crafting as well as how each relates to individual job crafting. On the one hand, individual job crafting might be transferred to the team level. For example, Mattarelli and Tagliaventi (2015) conducted a qualitative study demonstrating that individual crafting and collaborative crafting are complementary and that individual crafting paves the way for collaborative crafting. On the other hand, team-level job crafting can also stimulate individual job crafting. Team members share norms about the extent to which job crafting is seen as an expected behaviour, so when team members work together to change their jobs, this can also stimulate individual job crafting behaviour (Tims et al., 2013).

References

Akkermans, J., & Tims, M. (2017). Crafting your career: How career competencies relate to career success via job crafting. *Applied Psychology*, *66*(1), 168-195.

Ashforth, B. E., & Kreiner, G. E. (1999). "How can you do it?": Dirty work and the challenge of constructing a positive identity. *Academy of management Review*, *24*(3), 413-434.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, *22*(3), 309-328.

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, *22*(3), 273.

Bakker, A. B., Rodríguez-Muñoz, A., & Sanz Vergel, A. I. (2016). Modelling job crafting behaviours: Implications for work engagement. *Human Relations*, *69*(1), 169-189.

Bakker, A. B., Tims, M., & Derks, D. (2012). Proactive personality and job performance: The role of job crafting and work engagement. *Human Relations*, *65*(10), 1359-1378.

Bavik, A., Bavik, Y. L., & Tang, P. M. (2017). Servant leadership, employee job crafting, and citizenship behaviours: A cross-level investigation. *Cornell Hospitality Quarterly*, *58*(4), 364-373.

Berdicchia, D., Nicolli, F., & Masino, G. (2016). Job enlargement, job crafting and the moderating role of self-competence. *Journal of Managerial Psychology, 31*(2), 318-330.

Berdicchia, D., & Masino, G. (2017). Exploring the antecedents of job crafting: A conditional process analysis. *International Journal of Business and Management*, *12*(12), 1-14.

Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013). Job crafting and meaningful work. In B.J. Dik, Z. S. Byrne, & M. F. Steger (Eds.), *Purpose and meaning in the workplace* (pp. 81-104). Washington, DC: American Psychological Association.

Bipp, T., & Demerouti, E. (2015). Which employees craft their jobs and how? Basic dimensions of personality and employees' job crafting behaviour. *Journal of Occupational and*

Organizational Psychology, *88*(4), 631-655.

Bizzi, L. (2017). Network characteristics: When an individual's job crafting depends on the jobs of others. *Human Relations*, *70*(4), 436-460.

Brenninkmeijer, V., & Hekkert-Koning, M. (2015). To craft or not to craft: The relationships between regulatory focus, job crafting and work outcomes. *Career Development International*, *20*(2), 147-162.

Bruning, P., & Campion, M. (2018). A role-resource approach-avoidance model of job crafting: A multi-method integration and extension of job crafting theory. *Academy of Management Journal*, *61*(2), 499-522.

Campion, M. A., & Thayer, P. W. (1985). Development and field evaluation of an interdisciplinary measure of job design. *Journal of Applied Psychology, 70*(1), 29–43.

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality–social, clinical, and health psychologwy. *Psychological Bulletin, 92*(1), 111-135.

Cenciotti, R., Alessandri, G., & Borgogni, L. (2017). Psychological capital and career success over time: The mediating role of job crafting. *Journal of Leadership & Organizational Studies*, *24*(3), 372-384.

Chen, C. Y., Yen, C. H., & Tsai, F. C. (2014). Job crafting and job engagement: The mediating role of person-job fit. *International Journal of Hospitality Management*, *37*, 21-28.

Cheng, J. C., Chen, C. Y., Teng, H. Y., & Yen, C. H. (2016). Tour leaders' job crafting and job outcomes: The moderating role of perceived organizational support. *Tourism Management Perspectives*, *20*, 19-29.

Cheng, J. C., & Yi, O-Yang. (2018). Hotel employee job crafting, burnout, and satisfaction: The moderating role of perceived organizational support. *International Journal of Hospitality Management, 72*, 78-85.

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology, 95*(5), 834-848.

Cullinane, S. J., Bosak, J., Flood, P. C., & Demerouti, E. (2017). Job crafting for lean engagement: The interplay of day and job-level characteristics. *European Journal of Work and Organizational Psychology, 26*(4), 541–554.

Daniels, K. (2006). Rethinking job characteristics in work stress research. *Human Relations, 59*(3), 267-290.

Demerouti, E. (2014). Design your own job through job crafting. *European Psychologist, 19*(4), 237-247.

Demerouti, E., & Peeters, M. C. (2018). Transmission of reduction-oriented crafting among colleagues: A diary study on the moderating role of working conditions. *Journal of Occupational and Organizational Psychology, 91*(2), 209-234.

Demerouti, E., Bakker, A. B., & Gevers, J. M. (2015). Job crafting and extra-role behaviour: The role of work engagement and flourishing. *Journal of Vocational Behaviour, 91*, 87-96.

Demerouti, E., Bakker, A. B., & Halbesleben, J. R. (2015). Productive and counterproductive job crafting: A daily diary study. *Journal of Occupational Health Psychology, 20*(4), 457-469.

Dierdorff, E. C., & Jensen, J. M. (2018). Crafting in context: Exploring when job crafting is dysfunctional for performance effectiveness. *Journal of Applied Psychology, 103*(5), 463-477.

Dormann, C., & Griffin, M. A. (2015). Optimal time lags in panel studies. *Psychological Methods, 20*(4), 489-505.

Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation and*

Emotion, *30*(2), 111-116.

Esteves, T., & Lopes, M. P. (2017a). Leading to crafting: The relation between leadership perception and nurses' job crafting. *Western Journal of Nursing Research*, *39*(6), 763-783.

Esteves, T., & Lopes, M. P. (2017b). Crafting a calling: The mediating role of calling between challenging job demands and turnover intention. *Journal of Career Development*, *44*(1), 34-48.

Gordon, H., Demerouti, E., Le Blanc, P., & Bipp, T. (2015). Job crafting and performance of Dutch and American health care professionals. *Journal of Personnel Psychology*, *14*(4), 192-202.

Grant, A. M., Fried, Y., Parker, S. K., & Frese, M. (2010). Putting job design in context: Introduction to the special issue. *Journal of Organizational Behaviour*, *31*, 145-157.

Grant, A. M., & Parker, S. K. (2009). 7 redesigning work design theories: The rise of relational and proactive perspectives. *Academy of Management Annals*, *3*(1), 317-375.

Hakanen, J., Peeters, M., & Schaufeli, W. (2018). Different types of employee well-being across time and their relationships with job crafting. *Journal of Occupational Health Psychology*, *23*(2), 289–301.

Hakanen, J. J., Seppälä, P., & Peeters, M. C. (2017). High job demands, still engaged and not burned out? The role of job crafting. *International journal of behavioural medicine*, *24*(4), 619-627.

Harju, L. K., Hakanen, J. J., & Schaufeli, W. B. (2016). Can job crafting reduce job boredom and increase work engagement? A three-year cross-lagged panel study. *Journal of Vocational Behaviour*, *95*, 11-20.

Harju, L. K., Schaufeli, W. B., & Hakanen, J. J. (2018). A multilevel study on servant leadership, job boredom and job crafting. *Journal of Managerial Psychology*, *33*(1), 2-14.

Hetland, J., Hetland, H., Bakker, A. B., & Demerouti, E. (2018). Daily transformational leadership and employee job crafting: The role of promotion focus. *European Management Journal*, 1-11.

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, *52*(12), 1280-1300.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*(3), 513-524.

Hornung, S., Rousseau, D. M., Glaser, J., Angerer, P., & Weigl, M. (2010). Beyond top-down and bottom-up work redesign: Customizing job content through idiosyncratic deals. *Journal of Organizational Behaviour*, *31*, 187-215.

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, *92*(5), 1332-1356.

Kim, M., & Beehr, T. A. (2018). Can empowering leaders affect subordinates' well-being and careers because they encourage subordinates' job crafting behaviours?. *Journal of Leadership & Organizational Studies*, *25*(2), 184-196.

Kim, Gu-Ne., & Lee, Young-Min. (2016). Towards high performance organization: The impacts of job characteristics and job crafting. *International Journal of u-and e-Service, Science and Technology*, *9*(2), 85-100.

Kim, H., Im, J., & Qu, H. (2018). Exploring antecedents and consequences of job crafting. *International Journal of Hospitality Management*, *75*, 18-26.

Kira, M., van Eijnatten, F. M., & Balkin, D. B. (2010). Crafting sustainable work: Development of personal resources. *Journal of Organizational Change Management*, *23*(5), 616-632.

Kooij, D. T., Tims, M., & Akkermans, J. (2017). The influence of future time perspective on work engagement and job performance: The role of job crafting. *European Journal of Work and Organizational Psychology*, *26*(1), 4-15.

Kooij, D. T., van Woerkom, M., Wilkenloh, J., Dorenbosch, L., & Denissen, J. J. (2017). Job crafting towards strengths and interests: The effects of a job crafting intervention on person–job fit and the role of age. *Journal of Applied Psychology*, *102*(6), 971-981.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology*, *58*(2), 281-342.

Laurence, G. (2010). *Workaholism and expansion and contraction-oriented job crafting: The moderating effects of individual and contextual factors*. ProQuest Dissertations Publishing. Retrieved from ProQuest Dissertations and Theses database. (Order No. AAI3429621).

Leana, C., Appelbaum, E., & Shevchuk, I. (2009). Work process and quality of care in early childhood education: The role of job crafting. *Academy of Management Journal*, *52*(6), 1169-1192.

Lee, J. Y., & Lee, Y. (2018). Job crafting and performance: Literature review and implications for human resource development. *Human Resource Development Review*, *17*(3), 277-313.

LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*, *48*(5), 764-775.

Lichtenthaler, P. W., & Fischbach, A. (2016a, August). Promotion-and prevention-focused job crafting: A theoretical extension and meta-analytical test. Paper presented at the 76th Annual Meeting of Academy of Management. Anaheim, United States.

Lichtenthaler, P. W., & Fischbach, A. (2016b). Job crafting and motivation to continue working beyond retirement age. *Career Development International*, *21*(5), 477-497.

Lichtenthaler, P. W., & Fischbach, A. (2018). Leadership, job crafting, and employee health

and performance. *Leadership & Organization Development Journal*, *39*(5), 620-632.

Lin, B., Law, K. S., & Zhou, J. (2017). Why is underemployment related to creativity and OCB? A task-crafting explanation of the curvilinear moderated relations. *Academy of Management Journal*, *60*(1), 156-177.

Lu, C. Q., Wang, H. J., Lu, J. J., Du, D. Y., & Bakker, A. B. (2014). Does work engagement increase person–job fit? The role of job crafting and job insecurity. *Journal of Vocational Behaviour*, *84*(2), 142-152.

MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioural and organizational research and some recommended solutions. *Journal of Applied Psychology, 90*(4), 710-730.

Mäkikangas, A. (2018). Job crafting profiles and work engagement: A person-centred approach. *Journal of Vocational Behaviour*, *106*, 101-111.

Mattarelli, E., & Tagliaventi, M. R. (2015). How offshore professionals' job dissatisfaction can promote further offshoring: Organizational outcomes of job crafting. *Journal of Management Studies*, *52*(5), 585-620.

McClelland, G. P., Leach, D. J., Clegg, C. W., & McGowan, I. (2014). Collaborative crafting in call center teams. *Journal of Occupational and Organizational Psychology*, *87*(3), 464-486.

Meijerink, J., Bos-Nehles, A., & de Leede, J. (2018). How employees' pro-activity translates high-commitment HRM systems into work engagement: the mediating role of job crafting. *The International Journal of Human Resource Management*, 1-26.

Moon, T. W., Youn, N., Hur, W. M., & Kim, K. M. (2018). Does employees' spirituality enhance job performance? The mediating roles of intrinsic motivation and job crafting. *Current Psychology*, 1–17.

Morrison, E. W. (1994). Role definitions and organizational citizenship behaviour: The

importance of the employee's perspective. *Academy of Management Journal*, *37*(6), 1543-1567.

Ng, T. W., & Feldman, D. C. (2010). The relationships of age with job attitudes: A meta-analysis. *Personnel Psychology*, *63*(3), 677-718.

Nielsen, K., & Abildgaard, J. S. (2012). The development and validation of a job crafting measure for use with blue-collar workers. *Work & Stress*, *26*(4), 365-384.

Nielsen, K., Antino, M., Sanz-Vergel, A., & Rodríguez-Muñoz, A. (2017). Validating the job crafting questionnaire (JCRQ): A multi-method and multi-sample study. *Work & Stress*, *31*(1), 82-99.

Niessen, C., Weseler, D., & Kostova, P. (2016). When and why do individuals craft their jobs? The role of individual motivation and work characteristics for job crafting. *Human Relations*, *69*(6), 1287-1313.

Nipper, N. G., van Wingerden, J., & Poell, R. (2018). The motivational potential of human resource development: Relationships between perceived opportunities for professional development, job crafting and work engagement. *International Journal of Learning and Development*, *8*(2), 27-42.

Parker, S. K., Bindl, U. K., & Strauss, K. (2010). Making things happen: A model of proactive motivation. *Journal of Management*, *36*(4), 827-856.

Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology*, *102*(3), 403-420.

Parker, S. K., Wall, T. D., & Jackson, P. R. (1997). “That's not my job”: Developing flexible employee work orientations. *Academy of Management Journal*, *40*(4), 899-929.

Peeters, M. C., Arts, R., & Demerouti, E. (2016). The crossover of job crafting between co-workers and its relationship with adaptivity. *European Journal of Work and Organizational Psychology*, *25*(6), 819-832.

Petrou, P., Bakker, A., & van den Heuvel, M. (2017). Weekly job crafting and leisure crafting: Implications for meaning-making and work engagement. *Journal of Occupational and Organizational Psychology, 90*(2), 129-152.

Petrou, P., Demerouti, E., Peeters, M. C., Schaufeli, W. B., & Hetland, J. (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behaviour*, *33*(8), 1120-1141.

Petrou, P., Demerouti, E., & Schaufeli, W. B. (2015). Job crafting in changing organizations: Antecedents and implications for exhaustion and performance. *Journal of Occupational Health Psychology*, *20*(4), 470.

Petrou, P., Demerouti, E., & Schaufeli, W. (2018). Crafting the change: The role of employee job crafting behaviours for successful organizational change. *Journal of Management, 44*(5), 1766–1792.

Petrou, P., Demerouti, E., & Xanthopoulou, D. (2017). Regular versus cutback-related change: The role of employee job crafting in organizational change contexts of different nature. *International Journal of Stress Management, 24*(1), 62-85.

Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. *Journal of Management, 36*(1), 94-120.

Qi, J., Li, J., & Zhang, Q. (2014). How organizational embeddedness and affective commitment influence job crafting. *Social Behaviour and Personality: An International Journal, 42*(10), 1629-1638.

Radstaak, M., & Hennes, A. (2017). Leader-member exchange fosters work engagement: The mediating role of job crafting. *SA journal of industrial psychology*, *43*(1), 1-11.

Rastogi, M., & Chaudhary, R. (2018). Job crafting and work-family enrichment: The role of positive intrinsic work engagement. *Personnel Review, 47*(3), 651-674.

Rofcanin, Y., Bakker, A. B., Berber, A., Gölgeci, I., & Las Heras, M. (2018). Relational job

crafting: Exploring the role of employee motives with a weekly diary study. *Human Relations*, 1-28.

Rofcanin, Y., Berber, A., Koch, S., & Sevinc, L. (2016). Job crafting and I-deals: A study testing the nomological network of proactive behaviours. *The International Journal of Human Resource Management, 27*(22), 2695-2726.

Rudolph, C., Katz, I., Lavigne, K., & Zacher, H. (2017). Job crafting: A meta-analysis of relationships with individual differences, job characteristics, and work outcomes. *Journal of Vocational Behaviour*, *102*, 112-138.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Scholer, A. A., & Higgins, E. T. (2008). Distinguishing levels of approach and avoidance: An analysis using regulatory focus theory. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 489-503). New York: Psychology Press.

Searle, B. J., & Auton, J. C. (2015). The merits of measuring challenge and hindrance appraisals. *Anxiety, Stress, & Coping*, *28*(2), 121-143.

Sekiguchi, T., Li, J., & Hosomi, M. (2017). Predicting job crafting from the socially embedded perspective: The interactive effect of job autonomy, social skill, and employee status. *Journal of Applied Behavioural Science*, *53*(4), 470-497.

Shin, Y., Hur, W. M., & Choi, W. H. (2018). Co-worker support as a double-edged sword: A moderated mediation model of job crafting, work engagement, and job performance. *The International Journal of Human Resource Management*, 1-22.

Short, J. (2009). The art of writing a review article. *Journal of Management*, *35*, 1312–1317.

Slemp, G. R., Kern, M. L., & Vella-Brodrick, D. A. (2015). Workplace well-being: The role of job crafting and autonomy support. *Psychology of Well-being*, *5*(1), 7.

Slemp, G. R., & Vella-Brodrick, D. A. (2013). The Job Crafting Questionnaire: A new scale to

measure the extent to which employees engage in job crafting. *International Journal of Wellbeing*, *3*(2), 126-146.

Slemp, G. R., & Vella-Brodrick, D. A. (2014). Optimizing employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-being. *Journal of Happiness Studies*, *15*(4), 957-977.

Solberg, E., & Wong, S. I. (2016). Crafting one's job to take charge of role overload: When proactivity requires adaptivity across levels. *The Leadership Quarterly*, *27*(5), 713-725.

Thun, S., & Bakker, A. B. (2018). Empowering leadership and job crafting: The role of employee optimism. *Stress and Health*, 1-9.

Tims, M., & Akkermans, J. (2017). Core self-evaluations and work engagement: Testing a perception, action, and development path. *PloS one*, *12*(8), 1-19.

Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology*, *36*(2), 1-9.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behaviour*, *80*(1), 173-186.

Tims, M., Bakker, A. B., & Derks, D. (2013). The impact of job crafting on job demands, job resources, and well-being. *Journal of Occupational Health Psychology*, *18*(2), 230.

Tims, M., Bakker, A. B., Derks, D., & Van Rhenen, W. (2013). Job crafting at the team and individual level: Implications for work engagement and performance. *Group & Organization Management*, *38*(4), 427–454.

Tims, M., Bakker, A. B., & Derks, D. (2015a). Job crafting and job performance: A longitudinal study. *European Journal of Work and Organizational Psychology*, *24*(6), 914-928.

Tims, M., Bakker, A. B., & Derks, D. (2015b). Examining job crafting from an interpersonal perspective: Is employee job crafting related to the well-being of colleagues?. *Applied Psychology*, *64*(4), 727-753.

Tims, M., Derks, D., & Bakker, A. B. (2016). Job crafting and its relationships with person–job fit and meaningfulness: A three-wave study. *Journal of Vocational Behaviour*, *92*, 44-53.

Travaglianti, F., Babic, A., & Hansez, I. (2016). The role of work-related needs in the relationship between job crafting, burnout and engagement. *SA Journal of Industrial Psychology*, *42*(1), 1-13.

Tuan, L. T. (2018). Behind the influence of job crafting on citizen value co-creation with the public organization: joint effects of paternalistic leadership and public service motivation. *Public Management Review*, *20*(10), 1533-1561.

Unsworth, K., Mason, C., & Jones, R. (2004). A use for rose-colored glasses? Cognitive reframing, job crafting & positive psychology at work. Paper presented at 18th Annual Australian New Zealand Academy of Management Conference, Dunedin, New Zealand.

Vogel, R. M., Rodell, J. B., & Lynch, J. W. (2016). Engaged and productive misfits: How job crafting and leisure activity mitigate the negative effects of value incongruence. *Academy of Management Journal*, *59*(5), 1561-1584.

Vogt, K., Hakanen, J. J., Brauchli, R., Jenny, G. J., & Bauer, G. F. (2016). The consequences of job crafting: A three-wave study. *European Journal of Work and Organizational Psychology*, *25*(3), 353-362.

Wang, H., Demerouti, E., & Bakker, A. B. (2016). A review of job crafting research: The role of leader behaviours in cultivating successful job crafters. In: S. K. Parker, & U. K. Bindl, (eds.) *Proactivity at work: Making things happen in organizations* (pp.77-104). Routledge, New York, USA.

Wang, H., Demerouti, E., & Le Blanc, P. (2017). Transformational leadership, adaptability, and job crafting: The moderating role of organizational identification. *Journal of Vocational Behaviour*, *100*, 185-195.

Wang, H., Demerouti, E., Le Blanc, P., & Lu, C. Q. (2018). Crafting a job in 'tough times': When being proactive is positively related to work attachment. *Journal of Occupational and Organizational Psychology*, 1-22.

Wang, H., Wang, X., & Li, J. (2018). Is new generation employees' job crafting beneficial or detrimental to organizations in China? Participative decision-making as a moderator. *Asia Pacific Business Review*, *24*(4), 543-560.

Wallace, C., & Chen, G. (2006). A multilevel integration of personality, climate, self-regulation, and performance. *Personnel Psychology*, *59*(3), 529-557.

Weseler, D., & Niessen, C. (2016). How job crafting relates to task performance. *Journal of Managerial Psychology*, *31*(3), 672-685.

Wong, S. I., Škerlavaj, M., & Černe, M. (2017). Build coalitions to fit: Autonomy expectations, competence mobilization, and job crafting. *Human Resource Management*, *56*(5), 785-801.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*(2), 179-201.

Wu, Chia-Huei, & Li, Wen-Dong (2016) *Individual differences in proactivity: A developmental perspective.* In: S. K. Parker, & U. K. Bindl, (eds.) *Proactivity at work: Making things happen in organizations* (pp.226-257). Routledge, New York, USA.

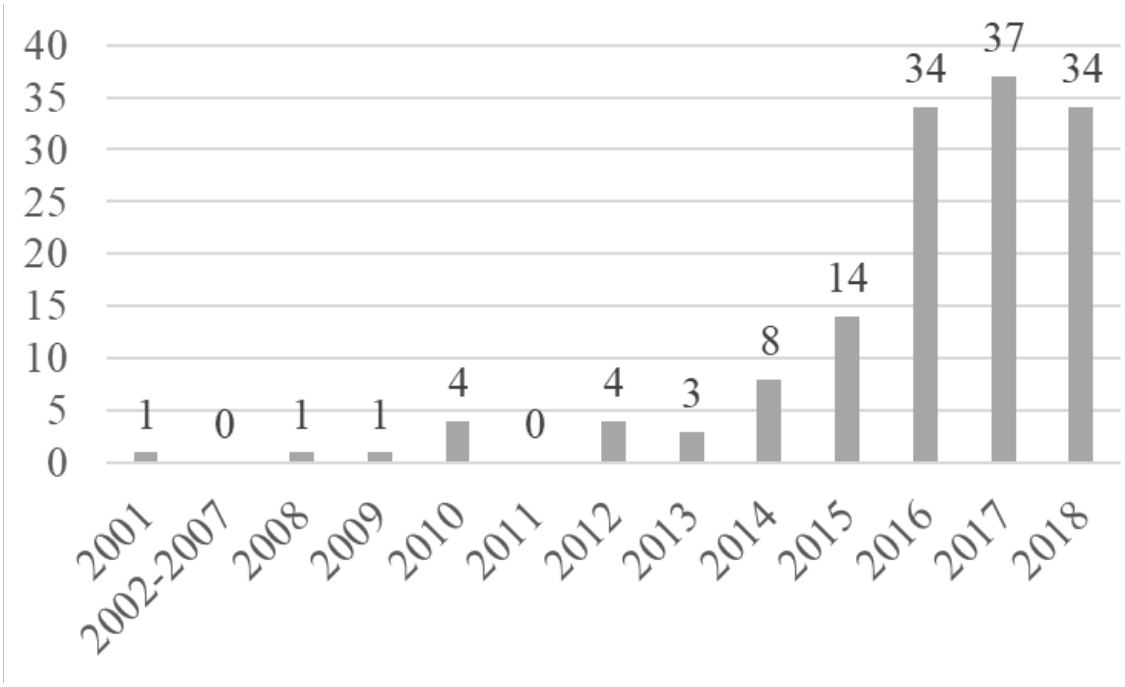
Yang, R., Ming, Y., Ma, J., & Huo, R. (2017). How do servant leaders promote engagement? A bottom-up perspective of job crafting. *Social Behaviour and Personality: an international journal*, *45*(11), 1815-1827.

Yepes-Baldó, M., Romeo, M., Westerberg, K., & Nordin, M. (2018). Job crafting, employee well-being, and quality of care. *Western Journal of Nursing Research*, *40*(1), 52-66.

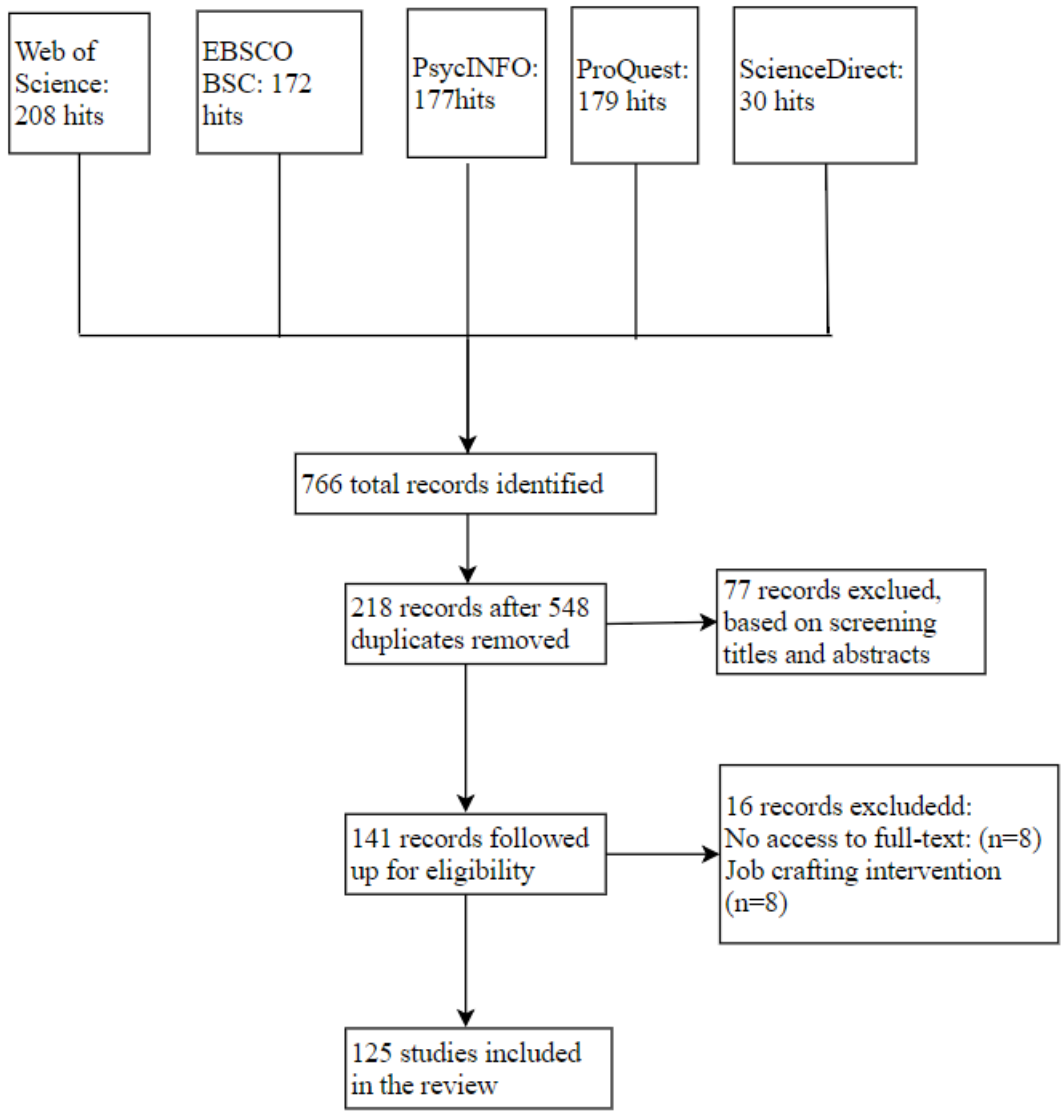
Zeijen, M. E., Peeters, M. C., & Hakanen, J. J. (2018). Workaholism versus work engagement and job crafting: What is the role of self-management strategies?. *Human Resource*

Management Journal, *28*(2), 357-373.

Supplement Figure 1: Number of published articles of job crafting since 2001



Supplement Figure 2: A flow diagram of the systematic literature search results, indicating databases searched, number of hits and reasons for study exclusion



Supplement Table 1: Job crafting measures from different perspectives

Measures from Wrzesniewski & Dutton's (2001) perspective			
Authors	**Sample**	**Country**	**construct**
Leana et al (2009)	206 teachers and 130 aides	America	Individual job crafting (6 items) Collective job crafting (6 items)
Laurence (2010)	163 employee and supervisor dyads	Japan, China	Physical expansion-oriented job crafting (11 items) Physical contraction-oriented job crafting (5 items) Relational/cognitive expansion-oriented job crafting (7 items) Relational/cognitive contraction-oriented job crafting (7 items)
Slemp & Vella-Brodrick (2013)	334 employees	Australia	Task crafting (5 items) Relational crafting (5 items) Cognitive crafting (5 items)
Niessen et al (2016)	466 employees	Germany	Task crafting (3 items) Relational crafting (4 items) Cognitive crafting (4 items)
Weseler & Niessen (2016)	138 employees	Germany	Task crafting-extending (3 items) Task crafting-reducing (3 items) Relational crafting-extending (2 items) Relational crafting-reducing (3 items) Cognitive crafting (3 items)
Bizzi (2017)	138 employees	America	Job crafting (task crafting) (8 items)
Bruning & Campion (2017)	196 employees and 50 supervisors	America	Work role expansion (5 items) Work organization (4 items) Adoption (5 items) Meta-cognition (5 items) Work role reduction (4 items) Social expansion (4 items) Withdrawal (3 items)
Kooij	136 employees		Work role reduction (4 items) Crafting toward strengths (5 items) Crafting toward interests (5 items)
Measures from job demands-resources perspective			
Tims et al (2012)	Study 1: 375 employees Study 2: 415 employees and 201 employees Study 3: 95 dyads	Netherlands	Increasing structural job resources (5 items) Increasing social job resources (5 items) Increasing challenging demands (5 items) Decreasing hindering demands (6 items)
Petrou et al (2012)	95 employees	Netherlands	Seeking resources (6 items) Seeking challenges (3 items) Reducing demands (4 items)
Nielsen et al (2012)	284 mail delivery workers	Denmark	Increasing challenging demands (4 items) Decreasing social job demands (3 items) Increasing social job resources (3 items) Increasing quantitative demands (3 items) Decreasing hindrance job demands (2 items)
Nielsen et al (2017)	Multi-sample	Spain, UK, China	Increasing challenging demands (4 items) Decreasing social job demands (3 items) Increasing social job resources (3 items) Increasing quantitative demands (3 items) Decreasing hindrance job demands (2 items)

Supplement Table 2: Job characteristics covered by existing measures

Job characteristics	M1	M2	M3	M4	M5	M6	M7
Job autonomy	1						
Task variety	3	3	2	3	6	4	9
Task significance			5	3	3		
Task identity				1			
Feedback from job							
Job complexity		1					
Information processing							
Problem solving			1			3	
Skill variety							
Skill use and development	5	1	2				5
Specialization							
Social support	2	4	5	2	2		4
Interdependence							
Interaction outside organization							
Feedback from others	3	1					
Physical demands		1					
Cognitive demands	3	2					1
Emotional demands	3	1		2	3		2
Role demands							

Note: M1: Tims et al. (2012); M2: Petrou et al. (2012); M3: Slemp & Vella-Brodrick (2013); M4: Niessen et al. (2016); M5: Weseler & Nissen (2016); M6: Bizzi (2016); M7: Bruning & campion (2018).

Appendix: John Wiley and Sons License

JOHN WILEY AND SONS LICENSE
TERMS AND CONDITIONS
Nov 20, 2019
This Agreement between Ms. Fangfang Zhang ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.
License Number: 4713361374233
License date: Nov 20, 2019
Licensed Content Publisher: John Wiley and Sons
Licensed Content Publication: Journal of Organizational Behaviour
Licensed Content Title: Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review
Licensed Content Author: Sharon K. Parker, Fangfang Zhang
Licensed Content Date: Oct 23, 2018
Licensed Content Volume: 40
Licensed Content Issue: 2
Licensed Content Pages: 21
Type of use: Dissertation/Thesis
Requestor type: Author of this Wiley article
Format: Electronic
Portion: Full article
Will you be translating? No
Title of your thesis /dissertation: Reorienting job crafting research: Theoretical clarification and novel investigations into demands crafting
Expected completion date: Dec 2019
Expected size (number of pages): 200
Requestor Location:
Ms. Fangfang Zhang
1/7 Princess Road, Crawley
Perth, WA 6009
Australia
Attn: Ms. Fangfang Zhang
Publisher Tax ID EU826007151

Total 0.00 AUD

TERMS AND CONDITIONS

This copyrighted material is owned by or exclusively licensed to John Wiley & Sons, Inc. or one of its group companies (each a"Wiley Company") or handled on behalf of a society with which a Wiley Company has exclusive publishing rights in relation to a particular work (collectively "WILEY"). By clicking "accept" in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the billing and payment terms and conditions established by the Copyright Clearance Center Inc., ("CCC's Billing and Payment terms and conditions"), at the time that you opened your RightsLink account (these are available at any time at http://myaccount.copyright.com).

Terms and Conditions

- The materials you have requested permission to reproduce or reuse (the "Wiley Materials") are protected by copyright.
- You are hereby granted a personal, non-exclusive, non-sub licensable (on a stand-alone basis), non-transferable, worldwide, limited license to reproduce the Wiley Materials for the purpose specified in the licensing process. This license, **and any CONTENT (PDF or image file) purchased as part of your order,** is for a one-time use only and limited to any maximum distribution number specified in the license. The first instance of republication or reuse granted by this license must be completed within two years of the date of the grant of this license (although copies prepared before the end date may be distributed thereafter). The Wiley Materials shall not be used in any other manner or for any other purpose, beyond what is granted in the license. Permission is granted subject to an appropriate acknowledgement given to the author, title of the material/book/journal and the publisher. You shall also duplicate the copyright notice that appears in the Wiley publication in your use of the
- Wiley Material. Permission is also granted on the understanding that nowhere in the text is a previously published source acknowledged for all or part of this Wiley Material. Any third party content is expressly excluded from this permission.
- With respect to the Wiley Materials, all rights are reserved. Except as

expressly granted by the terms of the license, no part of the Wiley Materials may be copied, modified, adapted (except for minor reformatting required by the new Publication), translated, reproduced, transferred or distributed, in any form or by any means, and no

- derivative works may be made based on the Wiley Materials without the prior permission of the respective copyright owner. **For STM Signatory Publishers clearing permission under the terms of the STM Permissions Guidelines only, the terms of the license are extended to include subsequent editions and for editions in other languages, provided such editions are for the work as a whole in situ and does not involve the separate exploitation of the permitted figures or extracts,** You may not alter, remove or suppress in any manner any copyright, trademark or other notices displayed by the Wiley Materials. You may not license, rent, sell, loan, lease, pledge, offer as security, transfer or assign the Wiley Materials on a stand-alone basis, or any of the rights granted to you hereunder to any other person.
- The Wiley Materials and all of the intellectual property rights therein shall at all times remain the exclusive property of John Wiley & Sons Inc, the Wiley Companies, or their respective licensors, and your interest therein is only that of having possession of and the right to reproduce the Wiley Materials pursuant to Section 2 herein during the continuance of this Agreement. You agree that you own no right, title or interest in or to the Wiley Materials or any of the intellectual property rights therein. You shall have no rights hereunder other than the license as provided for above in Section 2. No right, license or interest to any trademark, trade name, service mark or other branding ("Marks") of WILEY or its licensors is granted hereunder, and you agree that you shall not assert any such right, license or interest with respect thereto NEITHER WILEY NOR ITS LICENSORS MAKES ANY WARRANTY OR REPRESENTATION OF ANY KIND TO YOU OR ANY THIRD PARTY, EXPRESS, IMPLIED OR STATUTORY, WITH RESPECT TO THE MATERIALS OR THE ACCURACY OF ANY INFORMATION CONTAINED IN THE MATERIALS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, ACCURACY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, USABILITY, INTEGRATION OR

NON-INFRINGEMENT AND ALL SUCH WARRANTIES ARE HEREBY EXCLUDED BY WILEY AND ITS LICENSORS AND WAIVED BY YOU.

- WILEY shall have the right to terminate this Agreement immediately upon breach of this Agreement by you.
- You shall indemnify, defend and hold harmless WILEY, its Licensors and their respective directors, officers, agents and employees, from and against any actual or threatened claims, demands, causes of action or proceedings arising from any breach of this Agreement by you.
- IN NO EVENT SHALL WILEY OR ITS LICENSORS BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR ENTITY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR PUNITIVE DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, PROVISIONING, VIEWING OR USE OF THE MATERIALS REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.
- Should any provision of this Agreement be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, that provision shall be deemed amended to achieve as nearly as possible the same economic effect as the original provision, and the legality, validity and enforceability of the remaining provisions of this Agreement shall not be affected or impaired thereby.
- The failure of either party to enforce any term or condition of this Agreement shall not constitute a waiver of either party's right to enforce each and every term and condition of this Agreement. No breach under this agreement shall be deemed waived or excused by either party unless such waiver or consent is in writing signed by the party granting such waiver or consent. The waiver by or consent of a party to a breach of any provision of this Agreement shall

not operate or be construed as a waiver of or consent to any other or subsequent breach by such other party.

- This Agreement may not be assigned (including by operation of law or otherwise) by you without WILEY's prior written consent.
- Any fee required for this permission shall be non-refundable after thirty (30) days from receipt by the CCC.
- These terms and conditions together with CCC's Billing and Payment terms and conditions (which are incorporated herein) form the entire agreement between you and WILEY concerning this licensing transaction and (in the absence of fraud) supersedes all prior agreements and representations of the parties, oral or written. This Agreement may not be amended except in writing signed by both parties. This Agreement shall be binding upon and inure to the benefit of the parties' successors, legal representatives, and authorized assigns.
- In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall prevail.
- WILEY expressly reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.
- This Agreement will be void if the Type of Use, Format, Circulation, or Requestor Type was misrepresented during the licensing process.
- This Agreement shall be governed by and construed in accordance with the laws of the State of New York, USA, without regards to such state's conflict of law rules. Any legal action, suit or proceeding arising out of or relating to these Terms and Conditions or the breach thereof shall be instituted in a court of competent jurisdiction in New York County in the State of New York in the United States of America and each party hereby consents and submits to the personal jurisdiction of such court, waives any objection to venue in such court and consents to service of process by registered or certified mail, return receipt requested, at the last known address of such party.

WILEY OPEN ACCESS TERMS AND CONDITIONS

Wiley Publishes Open Access Articles in fully Open Access Journals and in

Subscription journals offering Online Open. Although most of the fully Open Access journals publish open access articles under the terms of the Creative Commons Attribution (CC BY) License only, the subscription journals and a few of the Open Access Journals offer a choice of Creative Commons Licenses. The license type is clearly identified on the article.

The Creative Commons Attribution License

The Creative Commons Attribution License (CC-BY) allows users to copy, distribute and transmit an article, adapt the article and make commercial use of the article. The CC-BY license permits commercial and non-

Creative Commons Attribution Non-Commercial License The Creative Commons Attribution Non-Commercial (CC-BY-NC)License permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes. (see below)

Creative Commons Attribution-Non-Commercial-NoDerivs License

The Creative Commons Attribution Non-Commercial-NoDerivs License (CCBY-NC-ND) permits use, distribution and reproduction in any medium, provided the original work is properly cited, is not used for commercial purposes and no modifications or adaptations are made. (see below)

Use by commercial "for-profit" organizations

Use of Wiley Open Access articles for commercial, promotional, or marketing purposes requires further explicit permission from Wiley and will be subject to a fee.

Further details can be found on Wiley Online Library

http://olabout.wiley.com/WileyCDA/Section/id-410895.html

Other Terms and Conditions:

v1.10 Last updated September 2015

Questions? customercare@copyright.com or +1-855-239-3415 (toll free in the US) or +1-978-646-2777.

Chapter 3: Reducing or optimizing demands? Effects of cognitive appraisal and autonomy on job crafting to change one's work demands

Fangfang Zhang

fangfang.zhang@postgrad.curtin.edu.au

Sharon K. Parker

s.parker@curtin.edu.au

School of Management, Faculty of Business and Law, Curtin University

Note: This chapter is presented as a journal article manuscript. A version of this manuscript was under review at the time this thesis was submitted.

Zhang, F., Parker, S.K. (2019), Reducing or optimizing demands? Effects of cognitive appraisal and autonomy on job crafting to change one's work demands. *Journal of Vocational Behaviour*, under review.

Abstract

There are two different job crafting strategies for employees to change their job demands: job crafting to optimize demands (optimizing demands) and job crafting to reduce demands (reducing demands). Research has shown some dysfunctional effects for crafters when they engage in reducing demands, yet positive effects for individuals when they engage in optimizing demands. However, little is known about the when and why employees choose to engage in reducing demands rather than optimizing them. Drawing on the transactional theory of stress, we theorize that individuals' primary appraisal of challenge or hindrance affects their secondary appraisal of control, which then affects their choice of demands crafting. We further theorize that individuals' primary appraisal interacts with their level of job autonomy to affect secondary control appraisals, with job autonomy also having a direct effect on control appraisals. We conducted one field study (Study 1, N = 235) and two scenario-based experiments (Study 2A, N = 148, and Study 2B, N = 179) to test our hypotheses. We found that, as expected, hindrance appraisal was consistently and positively related to reducing demands across all three studies, although this effect was not mediated via control appraisals. We also found that challenge appraisal positively affected optimizing demands via increased control appraisal, as expected. Job autonomy had a main effect on control appraisal but did not interact with challenge/hindrance appraisal in predicting control appraisal (Study 2A and 2B). These findings suggest the importance to take individuals' appraisals into account when investigate their demands crafting behaviours.

Keywords: job crafting, reducing demands, optimizing demands, challenge appraisal, hindrance appraisal, job autonomy

Employees nowadays are increasingly confronted with intensified job demands due to forces such as accelerated changes in organizations and global competition (Cascio, 2003; Rosa, 2003). Job demands are “those physical, social or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs” (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Excessive or chronic job demands require increased and sustained effort from employees, thus exhausting their physical and/or psychological resources, which in turn can lead to drained energy and even breakdown (Demerouti et al., 2001). Consistent with this reasoning, a great deal of empirical evidence has documented the physical and psychological costs of excessive job demands, such as increased strain and burnout, impaired physical health, and decreased motivation and performance (Alarcon, 2011; Gilboa, Shirom, Fried, & Cooper, 2008; Lang, Thomas, Bliese, & Adler, 2007, for meta-analyses).

This stream of literature on the negative outcomes of job demands builds on the premise that demands in a job are unaffected by employee actions. Yet, with the growing interest in proactivity at work, it has been recognized that individuals can proactively customize their jobs to better align the job with their abilities, needs and preferences, which is referred to as job crafting (Tims & Bakker, 2010, Wrzesniewski & Dutton, 2001). In particular, researchers have proposed two job crafting strategies pertinent to job demands: *job crafting to reduce demands* (*reducing demands*, Tims, Bakker, & Derks, 2012; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012), in which people avoid or reduce demanding tasks and relationships, and *job crafting to optimize demands* (*optimizing demands*, Demerouti & Peeters, 2018), in which crafters simplify or optimize work methods or processes to improve work efficiency and thereby lower their experienced demands.

Research has shown these two demands crafting strategies have very different effects, with several studies showing that reducing demands negatively relates to desirable outcomes

(Lichtenthaler & Fischbach, 2019; Rudolph, Katz, Lavigne, & Zacher, 2017), while optimizing demands is positively related to work engagement (Demerouti & Peeters, 2018). These findings, coupled with a closer inspection of the constructs, have led scholars to identify the former as a type of avoidance crafting and the latter as a type of approach crafting (Demerouti & Peeters, 2018; Zhang & Parker, 2019). In other words, optimizing demands, which involves effortful and directed actions to improve the environment, is regarded as a proactive behaviour, while reducing demands, which involves directed actions to escape from the demanding situation, is similar to withdrawal behaviours (Demerouti & Peeters, 2018; Zhang & Parker, 2019).

Nevertheless, to date, little is known about why some employees adopt avoidance-oriented crafting strategies such as reducing demands which mostly appear to have negative effects, yet other employees adopt approach-oriented crafting strategies such as optimizing demands which are more positive. The aim of this article is to theorize and investigate the processes through which job demands are associated with these two distinct demands crafting strategies. By understanding these processes, we pave the way for better identifying how to motivate more constructive responses to job demands.

To develop our hypotheses, we draw on research that has indicated that individuals' appraisals play a mediating role between job demands and individuals' coping behaviours (Lazarus & Folkman, 1984; LePine, Podsakoff, & LePine, 2005). According to the transactional theory of stress, in the evaluation process of primary appraisal, a job demand can be appraised as either a challenge or hindrance, which in turn affects the behavioural strategies one will use in the face of pressure (Lazarus & Folkman, 1984). Job crafting actions that individuals take to optimize or reduce their demands can be considered as the coping strategies they employ to deal with demanding situations. Thus, we extend this theorizing to investigate the role of individuals' challenge/hindrance appraisal in influencing

their choice of demands crafting strategies. Similarly, we theorize that challenge appraisal is likely to promote approach-oriented coping strategies, hence the greater use of optimizing such demands. On the other hand, we expect that hindrance appraisal will result in avoidance-oriented coping, hence the greater use of reducing those demands.

We then go further to assess how individuals' challenge or hindrance appraisal leads to optimizing demands or reducing demands. In the appraisal process, individuals' primary appraisals of challenge or hindrance are followed by a secondary appraisal (i.e., control appraisal) which involves judgements about available coping resources and hence the degree of control individuals perceive they have. In turn, control appraisal determines behavioural responses (Chang, 1998). Therefore, we theorize that primary appraisals of challenge or hindrance affect demands crafting strategies indirectly via control appraisal in this paper.

Furthermore, theory suggests that control appraisals are not only affected by individuals' primary appraisals of challenge or hindrance, but also by their available job resources in the situation (Mackey & Perrewe, 2014). Thus, we investigate the main effect of job autonomy, one important job resource, on individuals' control appraisals. Furthermore, we theorize that individuals with the same primary appraisal develop different levels of control appraisal in situations wherein relevant job resources are abundant as compared to limited. Thus we also investigate the potential moderating effect of job autonomy on the relationship between primary appraisals (challenge versus hindrance) and control appraisals. Specifically, we propose that the positive relationship between challenge appraisal and control appraisal will be stronger when job autonomy is high, whereas the negative relationship between hindrance appraisal and control appraisal will be stronger when job autonomy is low. Our hypothesized theoretical model is presented in Figure 1.

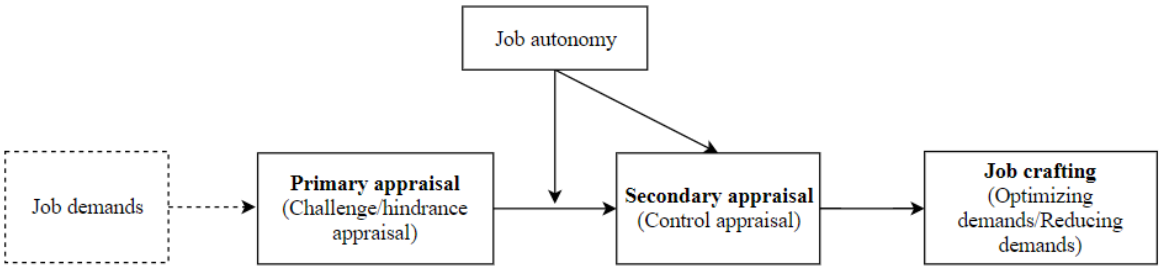


Figure 1: Hypothesized theoretical model

Our article contributes to the literature in important ways. First, we show that, when presented with job demands, an individual's challenge or hindrance appraisal shapes the type of demands crafting they engage in. We thus address scholars' call for research to better understand individuals' demands crafting (Rudolph et al., 2017). Understanding the processes that shape demands crafting can provide important information for organizations to guide and manage employees' crafting behaviours. For example, organizations can utilize this knowledge to encourage less use of reducing demands and greater use of optimizing demands, which will have implications for employees' stress and well-being, by enhancing challenge appraisals and limiting hindrance appraisals.

Second, in the current study, we used an experimental design, augmented by a field study, to help draw causal inferences about how an individuals' primary appraisal affects their demands crafting. Thus, we conducted two scenario-based experiments in which the job demands are the same for each participant, yet the (manipulated) appraisals are distinct, which allows us to focus on the effects of appraisals on crafting type. Such a design is important because, in a field study, individuals' appraisals, job demands, and crafting actions cannot easily be disentangled. For example, the perceived level of job demands is possibly affected by their challenge or hindrance appraisals. In other words, when individuals perceive a job demand as a challenge with potential gains, they might then also judge the level of job demand to be not very high. In addition, individuals may have taken action about the job demands, in which case the measured job demands are their enacted job demands (Daniels,

2006). Therefore, while we included a field study to help establish generalizability, the main approach we use in this study is a randomized experimental design.

Third, we focus on different mechanisms through which individuals' cognitive appraisal is associated with demands crafting, including both a primary appraisal process (i.e., as a challenge or hindrance) and a secondary appraisal process (i.e., in terms of perceived control). These two constructs are closely related and together shape the meaning of job demands for an individual (Folkman, 1982). Most research has focused on the role of primary appraisals in affecting individuals' psychological and behavioural responses, partly due to the situation that primary appraisal and secondary appraisal are not separable in many contexts (Holroyd & Lazarus, 1982). Thus, existing studies have either neglected secondary appraisals (e.g., Cash & Gardner, 2011; Gerich, 2017) or confounded these two constructs by specifying challenge appraisal as a potential gain with high control, while considering hindrance appraisal as a potential loss with low control (e.g., Harvey, Nathens, Bandiera, LeBlanc, 2010; Hemenover & Dienstbier, 1996). The distinction between a primary and secondary appraisal, can give a better understanding of the demands-appraisal-coping process (Dewe, 1991). Thus, by using an experimental design, we keep primary appraisal and secondary appraisals relatively independent from each other, which enables us to investigate their interrelationship and to improve the robustness of our findings.

Theory and Hypotheses

In the following section, we introduce existing research on reducing demands and optimizing demands as two major forms of demands crafting. We then draw on the transactional theory of stress (Lazarus & Folkman, 1984), job demands resources theory (Bakker & Demerouti, 2007) and job crafting theory (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001) to develop our hypotheses.

Two Types of Demands crafting

The original job crafting theory, based on the job demands resources perspective, proposed that employees can reduce their job demands when they feel overwhelmed, which is referred to as reducing demands crafting (Tims & Bakker, 2010; Tims, Bakker, & Derks, 2012). However, some scholars have suggested that individuals can also restore fit in their jobs by optimizing demands, which means taking self-initiated actions targeted towards simplifying or optimizing work processes to improve work efficiency (Demerouti & Peeters, 2018).

To understand the effects of different types of job crafting behaviours, some scholars have applied approach/avoidance theory, suggesting optimizing demands to be approach crafting and reducing demands to be avoidance crafting (Bruning & Campion, 2018; Lichtenthaler & Fischbach, 2019, Zhang & Parker, 2019). Approach crafting fits the definition of proactive behaviour which is characterized by self-starting, a change orientation and a future orientation (Parker, Bindl, & Strauss, 2010), but avoidance crafting is more passive. Empirical evidence has supported this reasoning. Specifically, optimizing demands has been shown to be related with enhanced work engagement (Demerouti & Peeters, 2018), which is consistent with the positive outcomes of proactive behaviours (e.g., see meta-analyses Thomas, Whiteman, & Viswesvaran, 2010; Tornau & Frese, 2013). To supplement this, another meta-analysis (Rudolph et al., 2017) has shown that reducing demands was related to decreased work engagement, impaired task performance, and increased job strain.

Primary Appraisal of Challenge versus Hindrance

Founded on the transactional theory of stress (Lazarus & Folkman, 1984), we propose that individuals' appraisals of demands will shape what type of demands crafting they engage in. An appraisal is defined as an individual's cognitive perception and evaluation about a potential stressor or job demand. Specifically, Lazarus and Folkman (1984) identified two fundamental dimensions of appraisal: primary appraisal and secondary appraisal. A primary

appraisal refers to the evaluation of whether and how an encounter will affect one's well-being. A secondary appraisal is an evaluative process regarding one's resources and capacity to deal with the situation (Lazarus & Folkman, 1984), a concept we discuss further in the next section. Focusing on primary appraisals of potentially demanding situations, a 'challenge appraisal' refers to perceiving the situation as having the possibility for gain and growth, whereas a 'hindrance appraisal' or 'threat appraisal' refers to evaluating the situation as having the potential for harm and loss.

Employees who appraise job demands as challenges tend to experience more positive affect such as excitement, hope and eagerness (Folkman & Lazarus, 1985; Skinner & Brewer, 2002), which, in turn, can promote individuals' confidence and energy to address the demands (Baron, 1990; Kramer, Newton, & Pommerenke, 1993). Furthermore, because activated positive affect can broaden individuals' thoughts and actions (Fredrickson, 2001), challenge appraisals can enable individuals to utilize their knowledge and skills to solve the obstacles in a creative way. As a challenge appraisal indicates a potential for personal gain and development, individuals anticipate that their investment in time and energy will be rewarded. Thus, appraising a job demand as a challenge will also motivate individuals to invest their time and effort to achieve the expected positive outcomes (LePine, Zhang, Crawford, & Rich, 2016). Supporting the above reasoning, empirical studies have found that challenge appraisals are related to positive affect and attitudes (Prem, Ohly, Kubicek, & Korunka, 2017; Webster, Beehr, & Love, 2011), more problem-focused coping (Gardner & Fletcher, 2009), and proactive behaviours (Ohly & Fritz, 2010). Consistent with previous research, which has indicated that challenge appraisals can activate more approach-oriented goals and behaviours, we hypothesize that when job demands are appraised as challenges, employees are more likely to restore their fit with job demands through optimizing demands, an approach-oriented crafting.

Hypothesis 1a: Challenge primary appraisals of job demands will be positively related to optimizing demands.

In contrast, employees who appraise job demands as hindrances are likely to experience negative effect such as fear and anxiety (Folkman & Lazarus, 1985; Searle & Auton, 2015; Skinner & Brewer, 2002). The feeling of anxiety motivates individuals to move away from the threat and related consequences (Rodell & Judge, 2009; Roth & Cohen, 1986). An employee experiencing anxiety may withdraw some of his/her effort from the job and some contact with others to reduce the threats that lead to the feeling of anxiety. In general, negative affect elicited by a hindrance appraisal can deplete one's regulatory resources and inhibit goal pursuit (Carver & Scheier, 1990; Hobfoll, 1989). Thus, employees who perceive a job demand as a hindrance are likely to cope with the demanding situation more passively. Indeed, Blascovich, Seery, Mugridge, Norris and Weisbuch (2004) found that employees who perceive a demanding situation as a hindrance put less effort into the task at hand and performed worse than those who have a challenge appraisal. Several other studies have also supported the view that a hindrance appraisal is related to negative affect and attitudes, emotion-focused coping and withdrawal behaviours (Gardner & Fletcher, 2009; Webster et al., 2011). Consequently, we argue that employees with a hindrance appraisal will be reluctant to devote their energy to their work and will be likely to withdraw from their tasks and environment, which are indicators of reducing demands.

Hypothesis 1b: Hindrance primary appraisals of job demands will be positively related to reducing demands.

Secondary Appraisal of Perceived Control

Secondary appraisal is the evaluation of coping resources and options which determines how much control an individual perceives they have over an encounter (Lazarus & Folkman, 1984). Theoretically, primary appraisal is logically followed by secondary

appraisal, which, in turn, leads to subsequent coping responses (Chang, 1998). However, this underlying mechanism has rarely been investigated, partially due to the difficult separating primary appraisal and secondary appraisal processes in many contexts (Holroyd & Lazarus, 1982). To better understand the demands-appraisal-coping process, we investigate control appraisal as a key secondary appraisal process. We argue that individuals' primary appraisal of challenge or hindrance affects their feeling of control, which, in turn, stimulates different crafting actions to deal with job demands.

Specifically, an individuals' challenge or hindrance appraisal is likely to affect their control appraisal for two key reasons. First, affective states have been found to influence individuals' cognitive processes, such as the encoding of information (Bower, Gilligan, & Monteiro, 1981). Positive affect enables individuals to organize information more inclusively compared with negative affect (Isen & Daubman, 1984). As challenge appraisal is associated with positive affect, individuals who appraise a job demand as a challenge are more likely to succeed in finding available resources to meet that demand via a more thorough evaluation of their situation, hence they develop an appraisal of the demand as one which they can more readily control. In contrast, individuals who perceive a demanding situation as a hindrance may ignore potential resources available to them due to restrictive attention and information processing caused by the negative affect, which, in turn, reduces the extent to which they appraise the demand as being controllable.

The second reason that a challenge or hindrance appraisal affects control appraisal is that individuals' affective states have been associated with environmental mastery, defined as feeling competent about dealing with the environment (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). For example, Fredrickson et al. (2008) found a substantial increase in participants' environmental mastery after a six-week intervention study aimed at increased positive emotions. Therefore, it is likely that a challenge appraisal strengthens the feeling of

perceived control, while a hindrance appraisal weakens the sense of perceived control. Our hypothesis is:

Hypothesis 2a: Challenge primary appraisal will be positively related to control appraisal. *Hypothesis 2b*: Hindrance primary appraisal will be negatively related to control appraisal.

Research has shown that control appraisals are associated with subsequent coping actions. Specifically, when individuals perceive high control over a demanding situation, they will be more confident that they can change the environment. Therefore, the more control individuals feel over a demanding situation, the more likely they will engage in problem-focused or approach coping. Conversely, when individuals perceive little control over a demanding situation, this is likely to result in emotion-focused or avoidance coping (Chang, 1998; Folkman & Lazarus, 1985). Consistent with prior theory and empirical research, we argue that an employee's appraisal of a job demand as one which they can highly control will be positively related to optimizing demands but negatively related to reducing demands.

Hypothesis 3a: Control appraisal will be positively related to optimizing demands.

Hypothesis 3b: Control appraisal will be negatively related to reducing demands.

Taken together, following the process of primary appraisal, secondary (i.e., control) appraisal and coping in the transactional stress and coping model, we propose a mediation model in which control appraisal mediates the relationship between primary appraisal and demands crafting. Specifically, when individuals appraise a job demand as a challenge, they will perceive more control over the demanding situation, which, in turn, leads to a greater use of approach-oriented crafting (i.e., optimizing demands). Conversely, when individuals appraise a job demand as a hindrance, they will perceive less control over the demanding situation, which, in turn, leads to a greater use of avoidance-oriented crafting (i.e., reducing demands).

Hypothesis 4a: Challenge primary appraisal will be related to more optimizing demands indirectly through increased control appraisal.

Hypothesis 4b: Hindrance primary appraisal will be related to more reducing demands indirectly through decreased control appraisal.

Job Autonomy, Control Appraisal and Demands crafting

The extent to which an individual perceives control over a demanding situation is affected by primary appraisals, as hypothesized above, as well as situational factors. Regarding the latter, we focus on one situational factor in this research: job autonomy, i.e., the degree of freedom an individual has in work scheduling, work methods and decision-making (Morgeson & Humphrey, 2006). We choose job autonomy for two main reasons. First, job autonomy is one of the most important predictors of job crafting as it affects individuals' perceived opportunity to craft their job (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). Second, as indicated in the definition, job autonomy is closely related to individuals' perceived degree of control. Specifically, job autonomy enables employees to decide their timing, schedules, work methods of work, consequently it should increase employees' appraised control. Indeed, job autonomy has been regarded as an important indicator of job control in the job demand-control model (Karasek, 1979). There has been also empirical evidence supporting the positive relationship between job autonomy and perceived control (e.g., Thompson & Prottas, 2006). We therefore expect that:

Hypothesis 5: Job autonomy will be positively related to control appraisal.

In addition to this theorized main effect of job autonomy on control appraisal, we argue that the effect of primary appraisal (hindrance/challenge appraisals) on control appraisal may vary, depending on the level of job autonomy. When people have made a primary appraisal (in this case, whether the demand is a hindrance or challenge), individuals then evaluate their available resources (e.g., job resources) to cope with the job demand. When someone

perceives a job demand as a challenge, a high level of job autonomy enables the individual to mobilize available resources and change the environment, leading to an even higher sense of control. In contrast, when someone appraises a job demand as a hindrance, an environment in which this person has limited autonomy will hinder their energy to explore potential coping resources, hence resulting in an even greater impaired sense of control. Therefore, we expect that a high level of job autonomy will strengthen the positive relationship between challenge appraisals of job demands and control appraisal, while a low level of job autonomy will strengthen the negative relationship between hindrance appraisals of job demands and control appraisal.

Hypothesis 6a: The positive relationship between challenge appraisal and control appraisal will be stronger when job autonomy is high rather than low.

Hypothesis 6b: The negative relationship between hindrance appraisal and control appraisal will be stronger when job autonomy is low rather than high.

Overview of Studies

To test the hypotheses, we conducted an initial field study (Study 1) and two scenario-based experimental studies (Study 2A and Study 2B). In Study 1, we tested the relationship of primary appraisals (challenge or hindrance appraisal) with demands crafting (H1), and the indirect effect of control appraisal as a mediator between primary appraisals and demands crafting (H2-H4). In Study 2A and Study 2B, we manipulated individuals' primary appraisal as well as their level of job autonomy, which enabled us to keep primary appraisal and secondary appraisals separate, and hence allowed us to test all hypotheses (H1-H6).

The advantage of a field study design is its generalizability to real life contexts as we measured employees' appraisal and behaviours in natural work settings with a survey. However, the experimental studies are crucial for establishing causality because, in real work settings, perceptions of job demands are usually affected by factors such as individual

differences and job resources, meaning it is difficult to obtain an objective indicator of 'job demands'. Without such an objective indicator, any assessment of the degree of demands is likely to be entangled to some degree with one's appraisal. Our scenario-based experiments address this limitation by keeping the job demands constant and objective. We focused on workload as the indicator of demands as it is more neutral, thus it can equally be appraised as a challenge or a hindrance (Webster et al., 2011). A further issue with field studies is that it is difficult to disentangle primary appraisal from secondary appraisal using a survey design. Using an experimental design, however, we can manipulate primary appraisal and secondary appraisal separately.

Study 1

In this field study, we used a cross-sectional research design to investigate the relationship of challenge or hindrance appraisal (primary appraisals) with demands crafting (H1) and the indirect effect of control appraisal (secondary appraisal) between individuals' primary appraisal and their demands crafting (H2-H4).

Method

Sample and procedure. Participants were recruited from a tourism company in China through the company's intranet. Information about the study including study aims, procedure, confidentiality and the survey link was distributed through this intranet. 235 employees completed the survey, with 61.1% being female, a mean age of 29.38 years (SD = 4.66), and a mean tenure of 2.87 years (SD = 2.64). The highest level of education was either primary or secondary (4.7%), vocational (51.1%), or university (44.2%). On average participants worked 45.76 hours per week (SD = 6.94).

Measures. All measures used a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).

Challenge and hindrance appraisal. Appraisals of job demands were assessed with a

measure developed by LePine, Zhang, Crawford and Rich (2016), including challenge appraisal (3 items, e.g., “Working to fulfil the demands of my job helps to improve my personal growth and well-being”; α = .83) and hindrance appraisal (3 items, e.g., “Working to fulfil the demands of my job thwarts my personal growth and well-being”; α = .83).

Control appraisal. Control appraisal was measured with four items developed by Parker, Turner and Williams (2006) (α = .82). An example item is “I feel powerless to control the outcomes of the process I work on.” As all items were negatively framed, we reverse coded the items so that low scores denote a lack of control.

Reducing demands. Reducing demands was measured with six items developed by Tims et al., (2012) (α = .79). An example item is “I organize my work in such a way to make sure that I do not have to concentrate for too long a period at once”.

Optimizing demands. Optimizing demands was measured with five items developed by Demerouti and Peeters (2018) (α = .81). An example item is “I change work processes or procedures which delay my work”.

Results

Confirmatory factor analysis (CFA) and descriptive statistics. CFA was conducted to test the factorial validity of all measures using maximum likelihood estimation with robust chi-squares and standard errors (MLR) with Mplus 8.1 (Muthén & Muthén, 2017).

Table 1
CFA Results for Study 1

Models	MLRχ^2(df)	CFI	TLI	RMSEA [90% CI]	SRMR
Five-factor model	303.08*(178)	.92	.90	.06[.05, .07]	.07
Four-factor model 1	499.50*(182)	.79	.75	.09[.08, .10]	.09
Four-factor model 2	472.29*(182)	.80	.77	.09[.08, .10]	.10
One-factor model	1137.64*(188)	.36	.28	.16[.15, .17]	.15

Note: * p<.001, Four-factor model 1: challenge appraisal and hindrance appraisal were combined as one factor, Four-factor model 2: reducing demands and optimizing demands were combined as one factor.
RMSEA, root mean square error of approximation; CFI, comparative fit index; TLI, Tucker Lewis index; SRMR, standardized root mean square residual.

We contrasted a 5-factor baseline model including challenge appraisal, hindrance appraisal, control appraisal, reducing demands and optimizing demands with three competing

models in which (a) challenge appraisal and hindrance appraisal were combined as one factor, (b) reducing demands and optimizing demands were combined as one factor, (c) all measures were combined as one factor. Results in Table 1 show that the five-factor baseline model fitted the data best ($\chi^2_{(178)}$ = 303.08, RMSEA = .06, CFI = .92, TLI = .90, SRMR = .07).

Means, standard deviations and correlations of variables in Study 1 are shown in Table 2. Results show that challenge appraisal was not significantly related to optimizing demands (r =.11, p = .11), although hindrance appraisal was significantly positively related to reducing demands (r =.20, p < .01). Challenge appraisal was positively associated with control appraisal (r = .29, p < .01), and hindrance appraisal was negatively related to control appraisal (r = -.46, p < .01). Control appraisal was positively related to optimizing demands (r = .15, p < .05), but not significantly associated with reducing demands (r = -.06, p = .40). These zero-order correlations provided initial evidence about the hypotheses, but they are limited because the correlation between two variables did not take the influences of other variables into account.

Table 2
Means, Standard Deviations, and Correlations Among Variables in Study 1

	M	SD	1	2	3	4	5
1. Challenge appraisal	4.05	0.68	(.83)				
2. Hindrance appraisal	2.20	0.84	-.34**	(.83)			
3. Reducing demands	2.71	0.78	-.02	.20*	(.79)		
4. Optimizing demands	3.17	0.77	.11	-.08	.23**	(.81)	
5. Control appraisal	3.58	0.79	.29**	-.46**	-.06	-.15**	(.82)

* p<.05; ** p<.01;

Testing hypotheses. We conducted the path analysis with Mplus 8.1 to examine proposed main effects and mediating effects. Hypothesis 1a proposed that challenge appraisal was positively related to optimizing demands. Results of the path analysis showed that the total effect of challenge appraisal on optimizing demands was not significant (B = .11, SE = .07, with 95% confidence interval between -.034 and .261). Thus, H1a is not supported. Hypothesis 1b proposed a positive relationship between hindrance appraisal and reducing

demands. Results of the path analysis showed that the total effect of hindrance appraisal on reducing demands was positive and significant (*B* = .18, *SE* = .06, with 95% confidence interval between .050 and .277), which supported H1b.

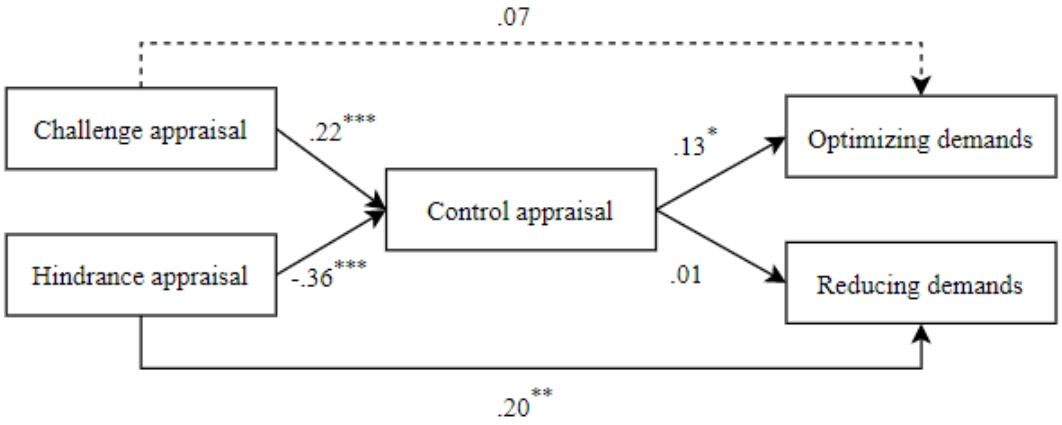


Figure 2: Main effects and mediation model

With the relationship between primary appraisals and control appraisal, as shown in Figure 2, challenge appraisal was positively related to control appraisal (β = .22, *SE* = .06, p < .001), while hindrance appraisal was negatively related to control appraisal (β = -.36, *SE* = .06, p < .001), supporting H2a and H2b. With the relationship between control appraisal and demands crafting, control appraisal was positively related to optimizing demands (β = .13, *SE* = .07, p < .05), supporting H3a. However, control appraisal was not significantly related to reducing demands, which did not support H3b.

To examine the indirect effect, we used Bootstrap estimates with 10,000 iterations and a bias-corrected confidence interval (95%). The indirect effect is statistically significant if the confidence interval excludes zero. The indirect effect of challenge appraisal on optimizing demands via control appraisal was .04, with a 95% confidence interval (CI) between -.005 and .088, which included zero. Thus, H4a was not supported. However, the 90% CI was between .001 and .077, which excluded zero. It indicated that there was a trend that challenge appraisal was related to more optimizing demands indirectly via increased control appraisal.

The indirect effect of hindrance appraisal on reducing demands was -.002, with a 95% CI between -.058 and .052, thus did not support H4b.

Discussion

Results from the field study partially supported our hypotheses. In general, we found a positive relationship between hindrance appraisal and reducing demands but did not found the indirect effect between them through control appraisal. Thus, hindrance appraisal was related to more reducing demands without the mediating effect of control appraisal. In contrast, there was a marginal significant indirect effect of challenge appraisal on optimizing demands through control appraisal. However, the total effect and direct effect of challenge appraisal on optimizing demands was not significant, which indicated that control appraisal fully mediated the positive relationship between challenge appraisal and optimizing demands. Overall, these results reveal that there might be different mechanisms for relationships of challenge appraisal or hindrance appraisal with optimizing demands or reducing demands respectively.

Due to the cross-sectional design of Study 1, we cannot draw causal conclusions about the relationship of challenge or hindrance appraisals (primary appraisal) with individuals' coping strategies in terms of optimizing demands or reducing demands. In addition, we did not include job demands in this study, which may affect employees' crafting behaviours. To improve the robustness of our results and demonstrate the causal relationship between primary appraisal and demands crafting, we conducted two scenario-based experiments in our next study.

Study 2

In this study, we conducted two scenario-based experimental studies in different scenario settings (call center customer representative vs. software developer) to test our overall hypothesized theoretical model. The experiment design enables us to keep the job

demand constant to each participant, which addressed the limitation in the field study. In both experiments, we manipulated participants' primary appraisal and job autonomy to test the overall moderated mediation model.

Method

Sample, design and procedure. Participants are employees working full-time or part-time from the USA recruited through Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011). Participants were asked to complete an online scenario-based survey which lasted for approximately 20 minutes and got $2 for compensation. We asked participants to answer several questions related to the scenario and manipulation materials to assure they understood the materials and data quality. 148 participants met our requirements in Study 2A (82 male, M_{age} = 41.40 years, SD_{age} = 11.13). On average, participants had a work experience for 230.1 months (SD = 145.5), and worked 39.75 hours per week (SD = 8.47). 182 participants successfully completed this survey (78 males, M_{age} = 40.29 years, SD_{age} = 10.65). On average, participants' total work experience was 209.22 months (SD = 126.46), and average working hours per week were 41.58 hours (SD = 6.37).

Participants were asked to read a scenario in which they were customer representatives in a call centre of a sale company (Study 2A) or software developers in a software development company (Study 2B). In both scenarios, participants were facing a high workload (see online supplement S.1). Participants then were randomly assigned to two manipulated conditions (challenge appraisal, hindrance appraisal), which instructed them to appraise workload as a challenge or a hindrance. After completing the appraisal manipulation checks, participants then were randomly assigned to two job autonomy conditions (high vs. low). Participants then completed the job autonomy manipulation checks, measures of control appraisal, reducing demands, optimizing demands and demographics. Upon completing this, participants were fully debriefed.

Primary appraisal manipulation. Participants were instructed to read one of two articles about workload which were written by the authors. After a short general introduction to the workload, which was same for each group, the information provided in the articles framed the workload as either positive or negative. The articles were written in the same style and had the same structure and length (around 200 words). To make the message credible, we summarized what the alleged research has shown concerning the effects of a high workload (see online supplement S.2).

The article for the cohort experiencing a simulated challenge stated the negative effects of a low workload, such as job boredom, reduced work motivation and engagement, and the positive effects of a high workload, such as staying focused and enhancing productivity. The article for the cohort experiencing a simulated hindrance stated the negative effects of a high workload, such as job stress and impaired work quality, and the positive effects of a low workload, such as staying focused and enhancing productivity.

Job autonomy manipulation. Participants were instructed to read one of two materials on their job autonomy which were written by the authors. We included three types of job autonomy in the material: work scheduling autonomy, work methods autonomy and decision-making autonomy (Morgeson & Humphrey, 2006). In the high autonomy condition, the material stated that participants can decide the schedule and methods that suit them best in their job, and they can make decisions over some issues. In the low autonomy condition, the material stated that participants' schedule and methods were constrained by the company, and they cannot change this by themselves, nor can they make their own decisions (see online supplement S.3).

Measures. All measures used a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).

Control appraisal. Control appraisal was measured with four self-developed items

(e.g., “I can manage the demands imposed on me by the increased workload”, α = .83 in Study 2A and .82 in Study 2B).

Reducing demands. To measure reducing demands, five items were adapted from the measure of decreasing hindering demands (Tims et al., 2012) (α = .81 in Study 2A and .78 in Study 2B). An example item is “I skip some tasks that I think are not very important”.

Optimizing demands. Optimizing demands was measured with same measure as in Study 1 (Demerouti & Peeters,2018, α = .77 in both studies).

Challenge and hindrance appraisal (used for manipulation check). Appraisals about the workload were assessed with a measure developed by Searle and Auton (2015), including challenge appraisal (4 items, e.g., “The high workload will help me to learn a lot in my job”; α = .93 in both studies) and hindrance appraisal (4 items, e.g., “The high workload will hinder any achievements I might have”; α = .93 in Study 2A and .94 in Study 2B).

In Study 2A, significant differences were found between two appraisal conditions for challenge appraisal, t (146) = -14.24, $p < .001$, and hindrance appraisal, t (146) = 14.47, $p < .001$. Participants in challenge condition reported higher challenge appraisal (M = 3.99, SD = 0.76) than participants in hindrance condition (M = 2.18, SD = 0.79). Participants in hindrance condition reported higher hindrance appraisal (M = 4.29, SD = 0.57) than participants in challenge condition (M = 2.40, SD = 0.99). In Study 2B, significant differences were found between the two conditions for the challenge appraisal, t (177) = -16.74, $p < .001$ and the hindrance appraisal, t (177) = 14.30, $p < .001$. Participants in the challenge condition reported a greater challenge appraisal (M = 4.31, SD = 0.66) than those in the hindrance condition (M = 2.51, SD = 0.79). Participants in the hindrance condition reported a greater hindrance appraisal (M = 3.96, SD = 0.73) than those in the challenge condition (M = 2.16, SD = 0.94). These results indicated that the primary appraisal manipulation was successful.

Job autonomy (used for manipulation check). Job autonomy was assessed with three items measuring work scheduling autonomy, decision-making autonomy and work method autonomy respectively (Morgeson & Humphrey, 2006, α = .97 in Study 2A and .98 in Study 2B,). An example item is "The job allows me to make a lot of decisions on my own".

In Study 2A, significant differences were found between two conditions in job autonomy, t (146) = -31.10, $p < .001$. Participants in high autonomy condition (M = 4.55, SD = 0.74) reported higher level of perceived job autonomy than low autonomy condition (M = 1.34, SD = 0.74). In Study 2B, significant differences were found between the two job autonomy conditions, t (177) = -30.79, $p < .001$. Participants in the high autonomy condition (M = 4.09, SD = 0.71) reported higher perceived job autonomy than those in the low autonomy condition (M = 1.54, SD = 0.96). Therefore, we concluded that our job autonomy manipulation was successful.

Results

We tested the mediation models using Model 4 in SPSS PROCESS (Hayes, 2013). To investigate the indirect effect of challenge or hindrance condition (primary appraisal) on demands crafting through control appraisal, we used bootstrap estimates with 10,000 iterations and a bias-corrected confidence interval (95%) (Preacher & Hayes, 2008). The indirect effect is statistically significant if the confidence interval excludes zero.

Regarding the relationship between primary appraisal and demands crafting, results showed that the total effect of primary appraisal on optimizing demands were not significant in both studies (*B* = .02, *SE* = .11, 95% CI = [-.20, .23] in Study 2A, *B* = .07, *SE* = .09, 95% CI = [-.11, .25] in Study 2B), which did not support H1a. The total effect of primary appraisal on reducing demands were significant in both studies (*B* = -.34, *SE* =.15, 95% CI = [-.64, -.03] in Study 2A, *B* = -.36, *SE* = .13, 95% CI = [-.63, -.10] in Study 2B), which supported H1b.

Table 3
Coefficient Estimates for the Mediation Model in Study 2A

	Control appraisal	Optimizing demands	Reducing demands
Primary appraisal	.76*** (.16)	-.19 (.11)	-.24 (.16)
Control appraisal		.27*** (.05)	-.13 (.08)

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

Table 4
Coefficient Estimates for the Mediation Model in Study 2B

	Control appraisal	Optimizing demands	Reducing demands
Primary appraisal	.76*** (.16)	-.12 (.09)	-.29* (.14)
Control appraisal		.27*** (.05)	-.10 (.08)

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

As shown in Table 3 and Table 4, the challenge appraisal condition was positively related to control appraisal in both studies (B = .76, SE = .16, p < .001 in both studies) supporting H2a and H2b. Control appraisal was positively related to optimizing demands in both studies (B = .27, SE = .05, p < .001 in both studies) which supported H3a. However, control appraisal was not significantly related to reducing demands in both studies, which did not support H3b.

Table 5
Total Effect and Indirect Effect for the Mediation Model in Study 2A

	B	*SE*	95% CI
Primary appraisal → Optimizing demands	.02	.11	[-.20, .23]
Primary appraisal → Reducing demands	-.34	.15	[-.64, -.03]
Primary appraisal → Control appraisal → Optimizing demands	.21	.06	[.10, .33]
Primary appraisal → Control appraisal → Reducing demands	-.10	.07	[-.25, .04]

Table 6
Total Effect and Indirect Effect for the Mediation Model in Study 2B

	B	*SE*	95% CI
Primary appraisal → Optimizing demands	.07	.09	[-.11, .25]
Primary appraisal → Reducing demands	-.36	.13	[-.63, -.10]
Primary appraisal → Control appraisal → Optimizing demands	.19	.05	[.10, .30]
Primary appraisal → Control appraisal → Reducing demands	-.07	.05	[-.18, .05]

As shown in Table 5 and Table 6, the indirect effects of primary appraisal on optimizing demands through control appraisal were significant (B = .21, SE = .06, 95% CI = [.10, .33] in Study 2A, B = .19, SE = .05, 95% CI = [.10, .30] in Study 2B). Thus, H4a was supported in both studies. However, we did not find significant indirect effects of primary appraisal on reducing demands through control appraisal (B = -.10, SE = .07, 95% CI = [-.25, .04] in Study 2A, B = -.07, SE = .05, 95% CI = [-.18, .05] in Study 2B). Thus, H4b was

not supported in both studies.

Table 7
Coefficient Estimates for the Moderated Mediation Model in Study 2A

	Control appraisal	Optimizing demands	Reducing demands
Primary appraisal	.95*** (.21)		
Job autonomy	.79*** (.22)		
Primary appraisal × job autonomy	-.29 (.30)		
Primary appraisal		-.19 (.11)	-.24 (.16)
Control appraisal		.27*** (.05)	-.13 (.08)

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

Table 8
Coefficient Estimates for the Moderated Mediation Model in Study 2B

	Control appraisal	Optimizing demands	Reducing demands
Primary appraisal	.76*** (.18)		
Job autonomy	.80*** (.17)		
Primary appraisal × job autonomy	-.13 (.24)		
Primary appraisal		-.12 (.09)	-.29* (.14)
Control appraisal		.27*** (.05)	-.10 (.08)

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

To investigate whether job autonomy moderates the relationship between primary appraisal conditions and control appraisal, we tested two moderated mediation models with optimizing demands and reducing demands as dependent variables using Model 7 in SPSS PROCESS (Hayes, 2013). As shown in Table 7 and Table 8, job autonomy had a main effect on control appraisal ($B = .79$, $p < .001$ in Study 2A; $B = .80$, $p < .001$ in Study 2B), which supported H5. However, there were no interacting effects of primary appraisal and job autonomy on control appraisal ($B = -.29$, $p > 0.05$ in Study 2B, $B = -.13$, $p > 0.05$ in Study 2B), which did not support H6.

Discussion

Consistent with Study 1, the two experiments results showed that the hindrance appraisal condition resulted in the greater use of reducing demands crafting, while the challenge appraisal condition did not affect the degree of engagement in optimizing demands. Furthermore, results reveal different mechanisms regarding how the challenge or hindrance primary appraisals affect demands crafting. Specifically, challenge appraisal condition led to a greater use of optimizing demands by enhancing the feelings of control over resources to

meet the challenge. Hindrance appraisal condition led to a greater use of reducing demands directly, and the feeling of control did not play a role between hindrance appraisal and reducing demands. In addition, job autonomy positively predicted control appraisal directly but did not interact with the primary appraisal condition to predict control appraisal.

General Discussion

The aim of this paper was to investigate why and when employees engage in different job demands crafting strategies when facing a demanding situation. We conducted a field study and two scenario-based experimental studies to investigate our hypotheses. We emphasize that, to reveal the causal inferences of challenge or hindrance appraisal (primary appraisal) and demands crafting, the results from the experimental studies are more rigorous.

Theoretical Contributions

First, our results show that individuals' cognitive appraisal plays a significant role in determining their demands crafting. Both the field study and the two experimental studies showed that hindrance appraisal was positively related to reducing demands. This is consistent with research based on the transactional theory of stress (Lazarus & Folkman, 1984), which showed hindrance appraisal was positively related to avoidance-oriented coping. Thus, this paper contributes to the literature by incorporating the transactional theory of stress into job crafting research.

However, as distinct from previous findings on the positive relationship between challenge appraisal and approach-oriented coping, the positive relationship between challenge appraisal and optimizing demands was not supported in our field study (Study 1) and the two experimental studies (Study 2A and 2B). This warrants closer investigation into underlying mechanism of these relationships, which we elaborate next.

Our second contribution is to extend the transactional theory of stress by revealing different processes through which individuals' challenge or hindrance appraisal (primary

appraisal) led to optimizing job demands or reducing job demands. The two experimental studies showed that the challenge appraisal condition affected optimizing demands by increasing control appraisal, while hindrance appraisal condition affected reducing demands directly, without any relationship to the effect of control appraisal. These results can be generalized as consistent findings were shown in the field study (Study 1). As we explain next, this may be due to the different natures of optimizing and reducing demands, with the former identified as a type of approach-oriented proactive behaviour while the latter is an avoidance-oriented withdrawal behaviour.

Research in proactive behaviour proposed three proactive motivations, “can do”, “reason to” and “energized to” (Parker, Bindl, & Strauss, 2010). Challenge appraisal involves “reason to” and “energized to” motivation as a challenge appraisal indicates the potential gain (which is the reason) and stimulates positive affect (which provides energy for individuals to engage in proactive behaviour). However, for the “can do” motivation, which involves the evaluation of the costs of an action, the ability and resources control to undertake an action is also important (Parker, Bindl, & Strauss, 2010). The “can do” motivation is also the focus of control appraisal in the transactional theory of stress (Lazarus & Folkman, 1984).

Thus, in our experiments, the challenge appraisal condition did not directly affect optimizing demands but indirectly affected it through increased control appraisal, which provides a strong sense of “can do”. Conversely, when a demanding situation is appraised as a hindrance, it stimulates the avoidance motivational state which inhibits individuals’ motivation to explore coping resources, in turn directly leading to coping by avoidance. Our findings reveal that the processes of challenge or hindrance appraisal-control, appraisal-demands crafting are different due to the approach or avoidance nature of the coping strategies. Thus, this paper extends the transactional theory of stress by incorporating other theories, such as the approach and avoidance motivation theory (Elliot, 2006).

Finally, our paper helps to articulate the effect of job autonomy for employees in dealing with job demands. Job demands-resources theory indicates that job resources can help employees to reduce job demands and their associated physical and psychological costs (Demerouti et al., 2001). Our findings suggest that the effect of job autonomy in assisting employees to deal with job demands are conditional. When an employee has a hindrance appraisal, the effect of job autonomy is limited as the person tends to step away from the job demands and lacks the motivation to mobilize the resources to deal with such job demands. The effect of job autonomy only becomes positive when individuals perceive job demands as a challenge, in which condition they are motivated to overcome the job demands to obtain potentially positive gains.

We did not find any moderating effect of job autonomy on the relationship between primary appraisal and control appraisal. This may be explained by trait activation theory which indicates that a position of strength is likely to attenuate the effect of individual differences on behaviours (Tett & Burnett, 2003). When employees are in a position of strength, wherein the job autonomy is very high, they tend to have a high sense of control, thus limiting the effect of their challenge appraisal on control appraisal. From trait activation theory, the effect of individuals' challenge appraisal will be salient in a weak situation in which job autonomy is low. This is contradictory to our final pair of hypotheses that high job autonomy will strengthen the positive effect of challenge appraisal and vice versa, so the two contradictory moderating effects might cancel out each other.

Practical Implications

As optimizing demands is a more favourable job crafting strategy than reducing demands, organizations can use our findings to better manage employees' crafting behaviours. To increase the use of optimizing demands, the key is to enhance employees' control appraisal. This can be achieved by encouraging employees to appraise job demands as

challenges and by providing more job autonomy. It is worth noting that simply increasing employees' challenge appraisal might not be effective if they perceive themselves to have little control over the demands, so it is important to use this appraisal change strategy alongside offering job resources.

Our results indicate that reducing demands is mainly affected by hindrance appraisal. Thus, the best way to lower the extent to which employees engage in reducing demands is to change the way they perceive their job demands. In the case of hindrance appraisal, offering job resources might be ineffective as employees lack motivation to mobilize these resources. We have shown in this paper that it is possible to change individuals' challenge or hindrance appraisal by providing informational support. Thus, organizations can develop interventions to foster employees' challenge appraisal and diminish their hindrance appraisal. However, it should be noted that organizations should keep job demands at a reasonable level for employees. If the job demands exceed the capacity of employees, forcing employees to form a challenge appraisal towards job demands might be unsuccessful and detrimental to employees' motivation and health.

Limitations and Implications for Future Research

Our studies have several notable limitations. First, as the experimental studies were conducted in a controlled and hypothetical environment, we were only able to test our dependent variables by measuring participants' crafting tendencies, as opposed to actual demands crafting behaviours. However, research has indicated a strong positive relationship between job crafting intentions and actual job crafting behaviours (Tims, Bakker, & Derks, 2015). In addition, we conducted a field study to establish the external validity of our paper.

Second, our experimental studies investigated participants' appraisals about one specific job demand. Employees experience various job demands in their work and may have different appraisals depending on the specific demands. However, our focus in this paper is

the relationship of individuals' appraisal to their demands crafting rather than the relationship of job demands to their appraisals. Therefore, we chose workload, which is open to appraisal, as the job demand constant to all participants in our experiments. Future research could replicate our research design with other job demands, such as time pressure.

Third, we did not find job autonomy to have a moderating effect on the relationship between primary appraisal and control appraisal. Another direction for future research is to examine other potential moderators such as other job resources (e.g., social support). In addition, we argued for positive affect or negative affect as underlying mechanisms through which challenge or hindrance appraisal (primary appraisal) led to outcomes, but we did not test this in our current research. Future research can test the indirect effect of positive or negative affect on the relationship of primary appraisal with control appraisal and dependent variables.

References

Alarcon, G. M. (2011). A meta-analysis of burnout with job demands, resources, and attitudes. *Journal of Vocational Behaviour*, *79*(2), 549-562.

Baron, R. A. (1990). Environmentally Induced Positive Affect: Its Impact on Self-Efficacy, Task Performance, Negotiation, and Conflict. *Journal of Applied Social Psychology*, *20*(5), 368-384.

Blascovich, J., Seery, M. D., Mugridge, C. A., Norris, R. K., & Weisbuch, M. (2004). Predicting athletic performance from cardiovascular indexes of challenge and threat. *Journal of Experimental Social Psychology*, *40*(5), 683-688.

Bower, G. H., Gilligan, S. G., & Monteiro, K. P. (1981). Selectivity of learning caused by affective states. *Journal of Experimental Psychology: General*, *110*(4), 451-473.

Bruning, P. F., & Campion, M. A. (2018). A role–resource approach–avoidance model of job crafting: A multimethod integration and extension of job crafting theory. *Academy of Management Journal*, *61*(2), 499-522.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?. *Perspectives on Psychological Science*, *6*(1), 3-5.

Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review*, *97*(1), 19.

Cascio, W. F. (2003). Changes in workers, work, and organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Industrial and Organizational Psychology* (Vol. 12, pp. 401–422). New York, NY: John Wiley & Sons.

Cash, M. L., & Gardner, D. (2011). Cognitive hardiness, appraisal and coping: comparing two transactional models. *Journal of Managerial Psychology*, *26*(8), 646-664.

Chang, E. C. (1998). Dispositional optimism and primary and secondary appraisal of a

stressor: Controlling for confounding influences and relations to coping and psychological and physical adjustment. *Journal of Personality and Social Psychology, 74*(4), 1109-1120.

Daniels, K. (2006). Rethinking job characteristics in work stress research. *Human Relations, 59*(3), 267-290.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499-512.

Demerouti, E., & Peeters, M. C. (2018). Transmission of reduction-oriented crafting among colleagues: A diary study on the moderating role of working conditions. *Journal of Occupational and Organizational Psychology, 91*(2), 209-234.

Dewe, P. (1991). Primary appraisal, secondary appraisal and coping: Their role in stressful work encounters. *Journal of Occupational Psychology, 64*(4), 331-351.

Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation and Emotion, 30*(2), 111-116.

Folkman, S. (1982). An approach to the measurement of coping. *Journal of Occupational Behaviour, 3*,95-107.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*(1), 150-170.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*(3), 218-226.

Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social*

Psychology, *95*(5), 1045.

Gardner, D., & Fletcher, R. (2009). Demands, appraisal, coping and outcomes: Positive and negative aspects of occupational stress in veterinarians. *International Journal of Organizational Analysis*, *17*(4), 268-284.

Gerich, J. (2017). The relevance of challenge and hindrance appraisals of working conditions for employees' health. *International Journal of Stress Management*, *24*(3), 270-292.

Gilboa, S., Shirom, A., Fried, Y., & Cooper, C. (2008). A meta-analysis of work demand stressors and job performance: Examining main and moderating effects. *Personnel Psychology*, *61*(2), 227-271.

Harvey, A., Nathens, A. B., Bandiera, G., & LeBlanc, V. R. (2010). Threat and challenge: Cognitive appraisal and stress responses in simulated trauma resuscitations. *Medical Education*, *44*(6), 587-594.

Hayes, Andrew F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: The Guilford Press

Hemenover, S. H., & Dienstbier, R. A. (1996). Prediction of stress appraisals from mastery, extraversion, neuroticism, and general appraisal tendencies. *Motivation and Emotion*, *20*(4), 299-317.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*: 513–524.

Holroyd, K. A. and Lazarus, R. S. (1982). Stress, coping, and somatic adaptation. In: Goldberger, L. & Breznitz, S. (Eds), *Handbook of stress: Theoretical and clinical aspects*, The Free Press, New York, pp. 21-35.

Isen, A. M., & Daubman, K. A. (1984). The influence of affect on categorization. *Journal of Personality and Social Psychology*, *47*(6), 1206-1217.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for

job redesign. *Administrative Science Quarterly*, *24* (2), 285-308.

Kramer, R. M., Newton, E., & Pommerenke, P. L. (1993). Self-enhancement biases and negotiator judgment: Effects of self-esteem and mood. *Organizational Behaviour and Human Decision Processes*, *56*(1), 110-133.

Lang, J., Thomas, J. L., Bliese, P. D., & Adler, A. B. (2007). Job demands and job pRerformance: The mediating effect of psychological and physical strain and the moderating effect of role clarity. *Journal of Occupational Health Psychology*, *12*(2), 116-124.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, Springer publishing company.

LePine, M. A., Zhang, Y., Crawford, E. R., & Rich, B. L. (2016). Turning their pain to gain: Charismatic leader influence on follower stress appraisal and job performance. *Academy of Management Journal*, *59*(3), 1036-1059.

LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*, *48*(5), 764-775.

Lichtenthaler, P. W., & Fischbach, A. (2019). A meta-analysis on promotion-and prevention-focused job crafting. *European Journal of Work and Organizational Psychology*, *28*(1), 30-50.

Mackey, J. D., & Perrewe, P. L. (2014). The AAA (appraisals, attributions, adaptation) model of job stress: The critical role of self-regulation. *Organizational Psychology Review*, *4*(3), 258-278.

Mason, W., & Suri, S. (2012). Conducting behavioural research on Amazon's Mechanical Turk. *Behaviour Research Methods*, *44*(1), 1-23.

Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ):

Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology, 91*(6), 1321-1339.

Muthén, L.K. and Muthén, B.O. (1998-2017). *Mplus user's guide*. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Ng, T. W., & Feldman, D. C. (2010). The relationships of age with job attitudes: A meta-analysis. *Personnel Psychology, 63*(3), 677-718.

Ohly, S., & Fritz, C. (2010). Work characteristics, challenge appraisal, creativity, and proactive behaviour: A multi-level study. *Journal of Organizational Behaviour, 31*(4), 543-565.

Parker, S. K., Bindl, U. K., & Strauss, K. (2010). Making things happen: A model of proactive motivation. *Journal of Management*, *36*(4), 827-856.

Parker, S. K., Williams, H. M., & Turner, N. (2006). Modeling the antecedents of proactive behaviour at work. *Journal of Applied Psychology*, *91*(3), 636-652.

Petrou, P., Demerouti, E., Peeters, M. C., Schaufeli, W. B., & Hetland, J. (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behaviour*, *33*(8), 1120-1141.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behaviour Research Methods, 40*(3), 879-891.

Prem, R., Ohly, S., Kubicek, B., & Korunka, C. (2017). Thriving on challenge stressors? Exploring time pressure and learning demands as antecedents of thriving at work. *Journal of Organizational Behaviour*, *38*(1), 108-123.

Rodell, J. B., & Judge, T. A. (2009). Can "good" stressors spark "bad" behaviours? The mediating role of emotions in links of challenge and hindrance stressors with citizenship and counterproductive behaviours. *Journal of Applied Psychology*, *94*(6),

1438-1451.

Rosa, H. (2003). Social acceleration: Ethical and political consequences of a desynchronized high-speed society. *Constellations*, 10, 3–33. https://doi.org/10.1111/1467-8675.00309.

Rudolph, C. W., Katz, I. M., Lavigne, K. N., & Zacher, H. (2017). Job crafting: A meta-analysis of relationships with individual differences, job characteristics, and work outcomes. *Journal of Vocational Behaviour*, *102*, 112-138.

Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist*, *41*(7), 813-819.

Searle, B. J., & Auton, J. C. (2015). The merits of measuring challenge and hindrance appraisals. *Anxiety, Stress, & Coping*, *28*(2), 121-143.

Skinner, N., & Brewer, N. (2002). The dynamics of threat and challenge appraisals prior to stressful achievement events. *Journal of Personality and Social Psychology*, *83*(3), 678-692.

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied psychology*, *88*(3), 500-517.

Thomas, J. P., Whitman, D. S., & Viswesvaran, C. (2010). Employee proactivity in organizations: A comparative meta-analysis of emergent proactive constructs. *Journal of Occupational and Organizational Psychology*, *83*(2), 275-300.

Thompson, C. A., & Prottas, D. J. (2006). Relationships among organizational family support, job autonomy, perceived control, and employee well-being. *Journal of Occupational Health Psychology*, *11*(1), 100-118.

Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology*, *36*(2), 1-9.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting

scale. *Journal of Vocational Behaviour*, *80*(1), 173-186.

Tims, M., Bakker, A. B., & Derks, D. (2015). Job crafting and job performance: A longitudinal study. *European Journal of Work and Organizational Psychology*, *24*(6), 914-928.

Tornau, K., & Frese, M. (2013). Construct clean-up in proactivity research: A meta-analysis on the nomological net of work-related proactivity concepts and their incremental validities. *Applied Psychology*, *62*(1), 44-96.

Webster, J. R., Beehr, T. A., & Love, K. (2011). Extending the challenge-hindrance model of occupational stress: The role of appraisal. *Journal of Vocational Behaviour*, *79*(2), 505-516.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*(2), 179-201.

Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour*, *40*(2), 126-146.

Supplement S.1: Background scenario information in Study 2A and Study 2B

Study 2A:

Assume that you are a full-time employee in GB company. Please read the material carefully to be familiar with your company and your job responsibilities. We will ask you some questions about your job after your reading.

You are a full-time call center customer service representative working in GB company.

GB company aims to promote people's health and happiness through supporting a healthy lifestyle. It is a leading supplier of home appliances (e.g., blenders) and natural foods.

You are a full-time call center customer representative within the company. When GB customers call to ask questions, you are responsible for answering their questions. Your responsibilities include:

1) providing information about the use of home appliances that are sold by GB;
2) providing information to customers about dietary aspects of GB's natural foods;
3) selling natural foods to customers;
4) selling home appliances to customers.

Recently, to boost sales performance, your company has provided a series of workshops on the topic of healthy living and daily diets to existing customers as well as potential customers. These workshops have been very successful, and the number of hotline calls has sharply increased.

Some of the hotline calls are about typical questions such as the use of appliances and product information. Some of the hotline calls are specifically focused on the food and recipes used in the workshops. Although the recipes and cooking instructions have been delivered on the workshops, some customers do not memorize all the details. There are also some customers who ask for an update of recipes beyond those on workshops.

Normally, you work from 9am to 6pm and have 100 phone calls every day on average. Now, the number of an average phone call has increased by at least one third. This means that there is hardly break between phone calls. Sometimes customers have to wait on the line for a while. To handle the

increased calls, you need to work faster and harder than before. You find it is difficult for you to finish your lunch without the interruption of phone calls.

As the interests of customers keep booming, you can expect the increased phone calls will last for a period of time. To maintain customer satisfaction, you have to answer the calls as soon as possible to avoid long waiting time annoying customers. At the same time, you also need to keep a good record of every phone call. The uncompleted records pile up soon as you hardly find enough break time to get them done. Overall, you are working at a very fast pace.

Study 2B:

Assume that you are a full-time employee in GB company. Please read the material carefully to become familiar with your company and your job responsibilities. We will ask you some questions about your job after your reading.

GB company is a leading software development company. GB company aims for delivering strong and robust software solutions to clients to help their business grow.

You are a full-time software developer working in the development department of GB. Your responsibilities include:

1) Designing and developing software systems;

2) Testing and modifying existing software to correct errors, to adapt it to new hardware, and to upgrade interfaces and improve performance;

3) Preparing reports or correspondence concerning project specifications, activities, or status;

4) Coordinating installation of software systems.

In the past few months, you have been working on two development projects. One is at the testing phase and the client has reported some bugs to be modified and improved. The other is at the development phase and the client has requested several new functions in the software. As your company employ “agile development” (which means involving clients at

every phase) you have to adjust the development according to clients' needs. Both the modifying and adjusting of software development requires considerable time and effort.

Recently, the enquires and clients of GB have increased due to a series of marketing strategies. To keep all the projects running well, your development team was recently assigned another two new development projects.

Normally, you and your development team can comfortably deal with two projects simultaneously, usually working from 9am to 6pm. However, with four ongoing projects, your workload has increased at least one third, or even more. To handle the increased workload and to meet the deadline of each project, you need to work faster and harder than before. It is difficult for you to find break time during the workday. You find the whole development team is under great time pressure. Sometimes, you and your colleagues miss your lunch to catch up on the backlog.

Overall, you are working at a very fast pace. As all the projects cannot be completed in a short time period, you expect that this situation with high workload will last for a while.

Supplement S.2: Primary appraisal manipulation

Challenge appraisal manipulation:

Workload is the objective amount of work an individual has to do. There is a distinction between the actual amount of work (workload) and the individual's perception of the workload (perceived workload). Workload can also be classified as quantitative (the amount of work to be done) or qualitative (the difficulty of the work). In your case, the quantitative workload (actual amount of work to be done) has increased as a result of GB's workshops creating a large number of calls.

Workload is a major component of our work, with important consequences. Findings from a great number of scientific studies have shown that low levels of workload can cause job boredom, and reduce your work motivation and engagement. Low levels of workload can cause you to feel under-stimulated, which means you do not give full attention to your tasks and responsibilities. Low levels of workload can cause mistakes and impair work quality. On the other hand, high levels of workload help you stay focused, energetic and alert. A high workload can boost your concentration and productivity. Employees with a high level of workload in their job are more likely to set challenging goals and utilize their skills to achieve their goals.

Hindrance appraisal manipulation:

Workload is the objective amount of work an individual has to do. There is a distinction between the actual amount of work (workload) and the individual's perception of the workload (perceived workload). Workload can also be classified as quantitative (the amount of work to be done) or qualitative (the difficulty of the work). In your case, the quantitative workload (actual amount of work to be done) has increased as a result of GB's workshops creating a large number of calls.

Workload is a major component of our work, with important consequences. Findings

from a great number of scientific studies have shown that high levels of workload can cause job stress, and can reduce your work motivation and engagement. High levels of workload can cause you to feel overwhelmed, which means you do not give full attention to your tasks and responsibilities. High levels of workload can cause mistakes and impair work quality. On the other hand, low levels of workload help you stay focused, energetic and alert. A low workload can boost your concentration and productivity. Employees with a low level of workload in their job are more likely to set challenging goals and utilize their skills to achieve their goals.

Supplement S.3: Job autonomy manipulation in Study 2A and 2B

High job autonomy

In your development department, you have some autonomy over aspects of your work. For example:

-You can have lunch any time that is convenient to you.

-You can use whichever work methods/schedules work best for you as long as they do not violate the company's regulations. For example, you can shift among different projects and decide when and which project you would like to work on.

-You have high decision latitude in your job. For example, you can try to figure out problems with your own solutions, although your project manager also gives you some suggestions.

Low job autonomy

In your development department, the work is standardized and there are strict requirements you must follow. For example:

-You must have lunch between 12-1pm

-You must use the work methods/schedules as specified by detailed job descriptions. For example, there is strict time requirement for working on different projects. For example, 9am-12pm is time to work on project A. You cannot shift among different projects without permission.

-You have very little decision latitude in your job. For example, you must follow the instructions your project manager gives to solve the problems.

Supplement S.4: Means, standard deviations, and correlations of variables in Study 2A and 2B

Table 1
Means, Standard Deviations, and Correlations Among Variables in Study 2A

	M	D	1	2	3	4	5
1. Challenge appraisal	3.16	1.19	1				
2. Hindrance appraisal	3.27	1.25	-.76**	1			
3. Control appraisal	3.56	1.02	.55**	-.46**	1		
4. Optimizing demands	4.28	0.66	.17**	-.09	.37**	1	
5. Reducing demands	2.66	0.95	-.15	.35**	-.19**	-.11	1

Table 2
Means, Standard Deviations, and Correlations Among Variables in Study 2B

	M	D	1	2	3	4	5
1. Challenge appraisal	3.40	1.16	1				
2. Hindrance appraisal	3.08	1.23	-.81**	1			
3. Control appraisal	3.67	0.95	.52**	-.49**	1		
4. Optimizing demands	4.34	0.62	.10	-.06	.38**	1	
5. Reducing demands	3.07	0.91	-.17*	.20**	-.17**	-.03	1

Chapter 4: When Is Decreasing Hindering Job Demands Positive? An Analysis of Job Crafting Profiles

Fangfang Zhang

fangfang.zhang@postgrad.curtin.edu.au

School of Management, Faculty of Business and Law, Curtin University

Maria Tims

m.tims@vu.nl

Department of Management and Organization, School of Business and Economics, Vrije Universiteit Amsterdam

Sharon K. Parker

s.parker@curtin.edu.au

School of Management, Faculty of Business and Law, Curtin University

Note: This chapter is presented as a journal article manuscript. This manuscript is planned to submit to the *Journal of Management*.

Zhang, F., Tims, M., Parker, S.K. When is decreasing hindering job demands positive? An analysis of job crafting profiles. Targeted journal: *Journal of Management.*

Abstract

There is a debate on whether decreasing hindering job demands is a proactive or avoidant crafting behaviour. Research findings have shown inconsistent results regarding the effect of decreasing hindering job demands. To reconcile the inconsistent findings on decreasing hindering job demands, in this article, we adopted a person-centred approach to recognize distinct job crafting profiles based on individuals' job crafting behaviours. Drawing on job crafting theory and conservation of resources theory, we proposed three job crafting profiles: proactive crafters, active crafters, and reactive crafters. To validate the job crafting profiles, we linked the job crafting profiles with predictors and outcomes. We proposed that proactive personality and job autonomy differentially predict these profiles. We further proposed that the proactive crafter profile is most desirable, with the highest levels of well-being and performance. Across two independent studies involving three samples of employees from a variety of organizations, we identified three job crafting profiles as expected. Latent profile similarity analyses showed that these job crafting profiles generalized across samples and across time. Our studies reveal that the role and effect of decreasing hindering job demands depends on the presence of approach forms of crafting, indicating the significance of the profile analyses for understanding the consequences of crafting behaviour at work.

Keywords: job crafting, decreasing hindering job demands, person-centred approach, work engagement, job performance

Introduction

Good work design has been theorized and shown to benefit employees' motivation, health, and performance (Parker, 2014). However, jobs are not only designed through managerial decision-making processes but can be actively redesigned by employees through job crafting, which is recognized as a powerful complement to more traditional top-down work redesigns (Wrzesniewski & Dutton, 2001). Job crafting is defined as the actions that employees self-initiate in their jobs to create a better job for themselves (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). In the current study, we investigate how job crafting profiles that involve combinations of approach forms of crafting co-occurring with avoidant forms of crafting advance a better understanding on the effects of these work behaviours.

More specifically, the job demands-resources perspective of job crafting proposed four job crafting strategies: 1) increasing structural job resources (e.g., seeking more job autonomy and development opportunities); 2) increasing social job resources (e.g., seeking advice from colleagues); 3) increasing challenging job demands (e.g., proactively engaging in projects beyond formal job responsibility); and 4) decreasing hindering job demands (e.g., keeping oneself away from emotionally-draining tasks or co-workers) (Tims, Bakker, & Derks, 2012). As stated in job crafting theories, all job crafting behaviours are anticipated to benefit employees because these behaviours enhance their fit with job, work meaningfulness and a positive identity, which, subsequently, associate with high levels of well-being and positive organizational outcomes (Berg, Dutton, & Wrzesniewski, 2013; Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001).

However, in contrast to job crafting theory, empirical findings only support this assertion for the first three job crafting strategies. Specifically, recent meta-analyses have shown that these three forms of job crafting are positively associated with more engaged, satisfied and higher-performed workers, whereas decreasing hindering job demands tends to

be related to diminished desirable outcomes, increased burnout and turnover intentions (Lichtenthaler & Fischbach, 2019; Rudolph, Katz, Lavigne, & Zacher, 2017).

To reconcile these confusing results in which decreasing hindering demands can have negative effects, one theoretical approach has drawn a distinction between approach job crafting and avoidance job crafting. Approach crafting is defined as crafting that is motivated towards problem-focused and improvement-focused goals, whereas avoidance crafting is directed towards reducing or eliminating parts of one's work (Bruning & Campion, 2018; Zhang & Parker, 2019). From this theoretical perspective, approach crafting (e.g., increase one's job resources and challenges) should promote desirable outcomes because it increases one's resources and one's fit with the job, whereas avoidance crafting (e.g., decrease or reduce one's job demands) should be negatively associated with those outcomes because the withdrawal behaviours prevent employees from fulfilling their job responsibilities, which may bring more burden to employees (Bruning & Campion, 2018; Zhang & Parker, 2019).

To some extent, the literature supports this theorizing. As noted above, almost all studies, including meta-analyses, show positive effects for approach forms of crafting, as would be expected. However, the literature shows inconsistent results concerning the effects of avoidance crafting. For example, regarding the relation of deceasing hindering job demands to work engagement, although many studies found negative results (e.g., Demerouti, Bakker, & Gevers, 2015; Demerouti, Bakker, & Halbesleben, 2015; Demerouti & Peeters, 2018; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012), some have reported non-significant results (e.g., Bakker, Rodríguez-Muñoz, & Sanz Vergel, 2016; Meijerink, Bos-Nehles, & de Leede, 2018; Tims et al., 2012, 2013) or positive results (e.g., Rastogi & Chaudhary, 2018). Theoretically, too, there is some confusion about the construct of decreasing hindering job demands. While some scholars suggest it is a withdrawal-oriented behaviour (Demerouti, 2014; Petrou et al., 2012), consistent with the notion of avoidance

crafting, others regard decreasing hindering job demands as a proactive behaviour (Bindl, Unsworth, Gibson, & Stride, 2018; Tims & Bakker, 2010) as it enhances one's emotional resources, which is contrary to the idea of avoidance crafting.

Altogether, therefore, the theorized distinction between approach and avoidance crafting – with the conclusion that the former is positive, and the latter is negative – does not appear to tell the whole story. The inconsistent findings with respect to decreasing hindering job demands and the consequent debate call for a more nuanced view. In this paper, we draw on Zhang and Parker's (2019) theorizing that decreasing hindering job demands can be proactive if this behaviour is part of a proactive goal and used together with approach forms of crafting, or, this behaviour can be a passive withdrawal-oriented behaviour when used in isolation from approach forms of crafting. In other words, the function of decreasing hindering job demands depends on what other forms of crafting it co-occurs with. Consequently, we argue that theory will be advanced by examining different forms of crafting together rather than in isolation. We aim, therefore, to establish the value of considering job crafting profiles that involve combinations of approach forms of crafting co-occurring with decreasing hindering job demands.

To pursue this goal, we conduct person-centred analyses to recognize distinct job crafting profiles founded on individuals' job crafting behaviours and investigate the antecedents and outcomes associated with these profiles. A key aspect to test the construct validation of latent profiles is to ascertain to what degree profiles can be generalized to distinct groups of participants and across multiple time points. We therefore assess the similarity of job crafting profiles across two different cultural samples (Study 1), and the longitudinal similarity of the same participants' job crafting profiles across two time points (Study 2).

Our research advances the job crafting literature in two crucial ways. First, this shift to

a person-centred approach fundamentally changes the way to understand job crafting and provides novel insights that differ from a variable-centred approach. To date, most studies of job crafting have leant on the variable-centred analytic strategy. This strategy is appropriate for understanding how individuals are different within the population on a particular variable, and is useful for capturing the interrelatedness of variables within a group of individuals but cannot reveal the characteristics of multiple subpopulations within a group of people (Wang & Hanges, 2011). It is possible that there are different subpopulations of crafters, with members of a subpopulation being similar to each other in terms of their profile of crafting, but distinct from members of other job crafting profiles. We use latent profile analysis (LPA) (Muthén & Muthén, 2000; Oberski, 2016) to examine the characteristics of employees who belong to different job crafting profiles in using job crafting strategies. Drawing upon the conservation of resources theory (COR, Hobfoll, 1989, 2001), we theorize three distinct subpopulations of crafters: individuals who engage in high levels of approach forms of crafting and a moderate amount of decreasing hindering job demands (proactive crafters); individuals who engage in moderate levels of both approach forms of crafting and decreasing hindering job demands (active crafters); and individuals who primarily engage in decreasing hindering job demands (reactive crafters).

A second contribution is that we validate the job crafting profiles by linking them to antecedents and outcomes that have been widely investigated in the variable-centred job crafting literature. Specifically, we identify job autonomy and proactive personality as antecedents, which we theorize increase the likelihood of membership of a particular job crafting profile. In addition, we link these profiles to positive individual and organizational outcomes (i.e., work engagement, job performance, and organizational citizenship behaviours (OCB)). The results show that proactive employees or workers with high job autonomy also engage in decreasing hindering job demands in conjunction with high levels of approach

forms of crafting, which supports our idea that decreasing hindering job demands constitutes part of a proactive goal. These analyses also reveal that the effect of decreasing hindering job demands might be more, or less dysfunctional, depending on whether the employee engages in other approach forms of crafting behaviours as well.

In what follows, we develop our hypotheses regarding job crafting profiles and their antecedents and outcomes. We then explain three studies that test these hypotheses.

Job Crafting Profiles

We draw upon the job demands-resources perspective of job crafting theory (Tims & Bakker, 2010), in conjunction with COR theory (Hobfoll, 1989, 2001), to propose three distinct job crafting profiles. The job demands-resources perspective of job crafting theory suggests that employees can adjust job aspects in terms of job demands and job resources to satisfy their passions, needs, skills and preferences (Tims & Bakker, 2010; Tims et al., 2012). As stated in the COR theory (Hobfoll, 1989, 2001), employees are driven to gain resources and protect themselves from resource loss. Specifically, employees engage in two distinct processes: resource protection or resource accumulation, depending on their existing level of resource loss and their associated motivations.

Consistent with COR theory and the resource accumulation process, the approach forms of job crafting aim to enhance desirable job aspects that build skills and opportunities to make the work environment resourceful and stimulating. In contrast, the avoidance forms of job crafting are targeted to avoid resource loss and therefore are similar to a resource protection process. Individuals with a pool of resources have greater opportunity to gain new resources and are more likely to engage in resource accumulation, for example, through approach forms of crafting. However, when individuals confront resource loss, they are more reluctant to invest in future resources and more likely to focus on protecting the remaining resources, such as through decreasing their job demands.

Drawing on this theory, we first identify '*proactive crafters*' as those employees with a pool of resources who have a greater capacity to gain new resources and who are more likely to engage in resource accumulation. Using available resources, these employees exert control over the environment and are motivated to further enrich their resource pool by proactively accumulating new resources in their work. Thus, we expect to see these individuals use more approach forms of crafting than other profiles. However, in order to have the capacity and resources to actually expand their roles through approach crafting, they have to reduce other demands, so we expect to see they also engage in reasonably amount of decreasing hindering job demands compared with other profiles. This fits with Zhang and Parker's (2019) idea that decreasing hindering job demands constitutes a component of an overall proactive strategy.

Second, we identify '*reactive crafters*' as those employees who have lost resources and who therefore focus on protecting resources they have and make less effort to accumulate new resources. According to COR theory, individuals need resources to meet job demands and perform well (Hobfoll, 1989). However, when these resources are lost or are not replenished, they are unlikely to cope with workplace demands and more likely to avoid or reduce these demands (Wright & Cropanzano, 1998). We therefore expect to see these employees engage in low levels of approach forms of crafting, compared with approach crafting in other profiles. We also expect to see in these individuals higher levels of decreasing hindering job demands, compared with their own approach forms of crafting, because these employees' goal is to reduce energy expenditure. This fits with Zhang and Parker's (2019) idea about the avoidant characteristic of decreasing hindering job demands when it is used in isolation without other approach forms of crafting.

Third, we identify '*active crafters*' as a mid-range group between proactive crafters and reactive crafters. Similarly to proactive crafters, these employees are also motivated to accumulate resources. However, they are not as proactive as proactive crafters, which may be

due to their insufficient resources. To protect themselves from any further resource loss, these individuals also reduce their job demands. We expect to see them engaging in modest amount of each job crafting behaviour as against other profiles, which is different from proactive crafters who use approach forms of crafting as their preferred strategy, and different from reactive crafters who use decreasing hindering job demands as their preferred strategy.

To add maximum value to a person-centred approach, indicators that define profiles should differ quantitatively or qualitatively (Marsh, Lüdtke, Trautwein, & Morin, 2009). Quantitative differences refer to differences in levels of profile indicators across groups. Quantitative differences in the current study means that the three groups of job crafters should differ in the strengths of their approach forms of crafting. Specifically, we propose that proactive crafters will engage in the highest level of approach forms of crafting, followed by active crafters and then reactive crafters. Qualitative differences mean that groups in different profiles have distinct hierarchical sequencing of profile indicator scores. In other words, to reiterate, we propose that proactive crafters engage in higher levels of approach forms of crafting than decreasing hindering job demands, while reactive crafters engage in a higher level of decreasing hindering job demands than approach forms of crafting. Active crafters use the two different job crafting strategies without particular preference; thus we do not hypothesize the ordering of approach crafting and decreasing hindering job demands in this intermediate group.

In sum, we propose our hypothesis in the following:

Hypothesis 1: There are three profiles of job crafters: proactive crafters are high on increasing structural resources, increasing social resources, increasing challenging demands with moderate to high scores on decreasing hindering job demands; active crafters have moderate scores on all of the above; reactive crafters are low on all crafting indicators except for decreasing hindering job demands, on which they are

high.

It is noteworthy that one study to date has investigated job crafting profiles (Mäkikangas, 2018) in which active and passive crafters were distinguished. Active job crafters were defined as employees who moderately use each form of crafting and passive crafters as those who primarily decrease job demands, corresponding to the terms of active and reactive crafters which we propose. However, we have theorized an additional group of crafters, proactive crafters, who engage in higher levels of approach forms of crafting than in decreasing hindering job demands but nevertheless use this last strategy as well. We also note some limitations with Mäkikangas' study, including a small sample size (N=131), and a sample which is female-dominated (75%) and homogenous (rehabilitation employees). Probably due to the homogeneity of the sample, the distribution of the two profiles was skewed, with 94% being active job crafters and only 6% being passive job crafters. In addition, the study was a diary study, which is not optimal since research has shown that employees' job crafting behaviours fluctuate on a daily basis (e.g., Cullinane, Bosak, Flood, & Demerouti, 2017; Demerouti et al., 2015; Hetland, Hetland, Bakker, & Demerouti, 2018; Tims, Bakker, & Derks, 2014), and whether the daily job crafting profiles can represent overall job crafting profiles is unclear. Incomplete measurement (as a result of the use of only two items per construct) could also increase measurement error of job crafting behaviours and lead to imprecise job crafting profiles. To overcome these limitations, in this study, we analyse five larger samples across multiple industries in four different countries to investigate job crafting profiles based on employees' general levels of job crafting.

Predictors of Job Crafting Profiles

Research has indicated that both individual differences and job characteristics play a significant role in motivating job crafting. One of the most frequently investigated individual characteristic is proactive personality; a proclivity to initiate positive changes to the

environment regardless of situational constraints (Bateman & Crant, 1993). Proactive employees craft undesirable job aspects to create a better environment for themselves (Bakker, Tims & Derks, 2012). Therefore, proactive employees are inclined to enrich their structural and social job resources through actions such as seeking autonomy, development opportunities and seeking help or feedback. In addition, proactive employees will actively search for challenges when they feel under-stimulated. To gain a better position to deal with job demands, proactive employees prepare for overcoming existing job demands or preventing future demands.

The variable-centred approach of job crafting research has indicated that proactive employees were associated with increased use of approach forms of crafting but diminished use of decreasing hindering job demands (Rudolph et al., 2017). Consistent with the variable-centred approach of job crafting research, we expect that the extent to which individuals have a proactive personality will differentiate the three job crafting profiles in terms of different levels of approach crafting in each profile. Specifically, the higher the proactive personality of employees, the more approach forms of crafting they will engage in.

Corresponding to the argument that decreasing hindering job demands constitutes part of a proactive goal, it is anticipated that proactive individuals might sometimes decrease hindering job demands in order to free up resources for approach crafting. For proactive employees, therefore, we expect to see reasonably high decreasing hindering demands, alongside the high levels of approach crafting. However, as proactive employees are inclined to accumulate resources in their jobs, they will rely more on approach forms of crafting than decreasing hindering job demands. Thus, we propose:

Hypothesis 2: Individuals high in proactive personality will have higher probability being proactive crafters as opposed to reactive crafters (H2a), being active crafters as opposed to reactive crafters (H2b), and being proactive crafters as opposed to active

crafters (H2c).

Employees who are motivated to make changes in their jobs are likely to assess the opportunities they have for crafting before engaging in these behaviours (van Wingerden & Poell, 2017; Wrzesniewski & Dutton, 2001). Job autonomy, defined as the extent of freedom in work scheduling, choosing methods to carry out work tasks and making decisions (Morgeson & Humphrey, 2006), plays a significant role in enhancing the possibility of job crafting (Petrou et al., 2012; Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). Job autonomy leads not only to meaningful and healthy work but also to felt responsibility for the job, which, in turn, leads to perceived opportunities for job crafting (Kim, Im, & Qu, 2018; Sekiguchi, Li, & Hosomi, 2017; Tims & Bakker, 2010).

From the variable-centred approach, a meta-analysis showed that job autonomy is associated with increased use of approach forms of job crafting, but diminished use of decreasing hindering job demands (Rudolph et al., 2017). Consistent with the variable-centred approach of job crafting research, we expect that as job autonomy increases, the approach forms of crafting employees engage in will increase. Thus, we expect that job autonomy will explain the quantitative differences among the three job crafting profiles. According to COR theory (Hobfoll, 2001), when employees possess job resources, they are in a better position to address job demands and accumulate additional resources (Hobfoll, 2002). Therefore, from the person-centred approach, when considering the combined use of job crafting strategies, a high level of job autonomy provides possibilities to reduce job demands as well as to accumulate job resources to achieve positive outcomes. In contrast, when job autonomy is low, employees have little opportunity to craft their jobs and experience a resource loss. To reduce the pressure of high job demands, they will primarily attempt to reduce their job demands (Wright & Cropanzano, 1998) and will be less inclined to use approach forms of crafting due to lack of resources required for future resource investment

(Hobfoll, 2001). Although our three profile classifications include decreasing hindering job demands to some extent, the hierarchical ordering of approach forms of crafting and decreasing hindering demands is different. Namely, the more job autonomy employees have, the more the preference for approach forms of crafting over decreasing hindering job demands. Thus, job autonomy differentiates the qualitative ordering of these three job crafting profiles. In summary, we hypothesize that the proactive crafters will have significantly greater job autonomy than the active crafters, who, in turn, will have more job autonomy than the reactive crafters:

> *Hypothesis 3:* Higher levels of job autonomy will increase the possibility of individuals being proactive crafters as opposed to reactive crafters (H3a), active crafters as opposed to reactive crafters (H3b), and proactive crafters as opposed to active crafters (H3c).

Consequences of Job Crafting Profiles

People who actively craft their jobs are likely to have better well-being because they have more control over their environment (Wrzesniewski & Dutton, 2001), an enhanced person-job fit (Chen, Yen, & Tsai, 2014; Lu, Wang, Lu, Du, & Bakker, 2014; Tims, Derks, & Bakker, 2016), which, in turn, generates favourable outputs for both individuals and organizations (Kristof-Brown, Zimmerman & Johnson, 2005). As stated in the job demands-resources theory (Bakker & Demerouti, 2007), adequate job resources and challenging demands can promote employees' motivation and performance. Therefore, when employees increase job resources and challenges through approach forms of crafting, this enhances their needs satisfaction for autonomy, relatedness and competency (Ryan & Deci, 2000), which, in turn, fosters employee well-being and performance (Slemp & Vella-Brodrick, 2014; Tims, Bakker & Derks, 2013, 2015). Meta-analyses on job crafting have shown consistent findings that employees who use more approach crafting are more engaged and better performed

(Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). On grounds of these findings, we expect that the more approach crafting employees use, the higher well-being, task performance and contextual performance (defined in this paper as organizational citizenship behaviour, OCB) they will report.

Decreasing hindering job demands is anticipated to protect employees from excessive job demands, but this strategy has been indicated as dysfunctional when investigated independently from other job crafting strategies (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). However, as discussed above, the variable-centred approach cannot capture the heterogeneity of different subpopulations of job crafters. Indeed, decreasing hindering job demands could either be a proactive strategy when it aligns with a future-focused proactive goal, or a relatively passive strategy when it aims to avoid tasks and relationships (Zhang & Parker, 2019). The only person-centred study of job crafting identified at the time of writing has shown preliminary results that decreasing hindering job demands was less detrimental when it was combined with approach forms of crafting (Mäkikangas, 2018). Those who proactively create opportunities for developing new skills or generate support from colleagues and simultaneously decrease hindering job demands may find their work engagement or job performance to still be at an adequate level. This is because they, in sum, have created a better job for themselves, one which may remain interesting and challenging. However, those who primarily decrease their job demands may have turned the work environment less motivating and resourceful (Petrou et al., 2012; Petrou, Demerouti, & Schaufeli, 2015). Therefore, the consequences of decreasing hindering job demands depend on the amount employees engage in approach forms of crafting at the same time. We expect that higher use of approach crafting employees engage in, when combined with decreasing hindering job demands will lead to better well-being and performance. Thus, we propose:

Hypothesis 4: Proactive crafters will report the highest levels of work engagement and

performance (task performance and OCB), followed by active crafters, and reactive crafters will report the lowest levels of work engagement and performance (task performance and OCB).

Overview of Studies

We conducted two studies to test the above hypotheses. In Study 1, we examined job crafting profiles in two different cultural samples, their profile similarity across these two samples, and the similarity of relationships of job crafting profiles with predictors and outcomes (predictive and explanatory similarity). In Study 2, to further support the construct validation of job crafting profiles, we assessed the longitudinal similarity of job crafting profiles across two time points within samples.

Study 1

Study 1 was designed to investigate and validate job crafting profiles in two different samples and examine the relationship of profiles with predictors and outcomes.

Method

Participants and procedure. Data used in Study 1 was part of a big project, and other parts of dataset has been reported in a published paper (Akkermans & Tims, 2017). However, the two studies focus on very different questions. Akkermans and Tims (2017) investigated whether employees' career competency enhance their perceived employability and work-home balance through job crafting, whereas this study aims to investigate different subpopulations of employees in their use of job crafting (that is, profiles), as well as how these profiles relate to employees' well-being and performance. The only overlap variable between this study and the published paper is job crafting. The research question, and the resulting theoretical and managerial implications from this study, are highly distinct from the published paper.

Sample 1. Respondents were recruited in the Netherlands, with the help of four HR

Management Masters students. The Masters students each reached out to their contacts within organizations and their social networks (e.g., LinkedIn and Facebook) to invite employees to participate in the study. Furthermore, the snowballing technique was used by providing participants with a standardized invitation including description of the research project and a survey link that they could spread among their colleagues. A total of 560 employees started filling in the online survey, of which 350 finished it (a response rate of 62.5%). Respondents were mainly female (60.1%) aged averagely 26.07 years (SD = 4.50). They had worked for about 2.18 years (SD = 2.13) in their current organization with a total work experience of 4.92 years (SD = 3.28). On average, respondents worked 35.97 hours per week (SD = 11.42). In terms of educational level, they mainly had a secondary education (12.3%), vocational education (38.6%), university education (45.4%) or others (3.7%), and were employed in the following sectors: business activities (19.9%), healthcare (12.5%), culture and other services (12.2%), education (11.1%), government (9.7%), financial activities (7.8%), trade (6.9%), construction (6.4%) and others (13.5%).

Sample 2. Three German HR Management Masters students collected the data in Germany, using the same procedure as described in Study 1. A total of 415 employees started the survey with 296 finishing it (response rate of 71.3%). Respondents were mainly female (63.5%) aged 24.21 years (SD =3.72). On average, they had worked for about 1.99 years (SD = 1.94) years in their current organization with a total work experience of 4.09 years (SD = 3.17). Respondents worked 40.11 hours per week (SD = 11) on average. In terms of educational level, they mainly had a secondary education (14.9%), vocational education (39.2%), university training (25.7%), or others (20.2%), and were employed in the following sectors: financial activities (32.1%), business activities (17.6%), production (11.1%), culture and other services (8.8%), trade (8.1%), government (8.1%), transport (3.7%) and others (10.5%).

Measures. All variables were rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) if not otherwise indicated. Back-translation procedure were adopted to ensure item accuracy (Brislin, 1986). All Cronbach alpha values were acceptable with values above .70 (see supplement Table S6 and Table S7).

Job crafting. Job crafting was assessed using the job crafting scale developed and validated by Tims et al. (2012) including four job crafting behaviours: increasing structural job resources (five items, e.g., "I try to learn new things at work"), increasing social job resources (five items, e.g., "I ask others for feedback on my job performance"), increasing challenging job demands (five items, e.g., "I regularly take on extra tasks even though I do not receive extra salary for them"), and decreasing hindering job demands (six items, e.g., "I make sure that my work is mentally less intense"). Answer categories ranged from 1 (*never*) to 5 (*often*).

Proactive personality. Proactive personality was measured with a shortened 4-item scale (Parker & Collins, 2010). An example item is: "If I believe in an idea, no obstacle will prevent me from making it happen".

Job autonomy. Job autonomy was measured with 4 items developed by Bakker, Demerouti, Taris, Schaufeli, & Schreurs (2003). An example item is "Do you have freedom to solve problems at work yourself?" Answer categories ranged from 1 (never) to 5 (always).

Work engagement. Work engagement was assessed using the Utrecht Work Engagement Scale (UWES) comprising three dimensions (Schaufeli, Bakker, & Salanova, 2006): vigour (3 items, e.g., "At my job, I feel strong and vigorous"), dedication (3 items, e.g., "My job inspires me"), and absorption (3 items, e.g., "I feel happy when I am working intensely"). The response categories ranged from 0 (*never*) to 6 (*always*).

Self-reported task performance. Task performance was assessed with a 7-item scale (Williams &Anderson, 1991). An example item is "I adequately complete assigned duties".

OCB. OCB toward individuals was assessed using a 7-item scale (Williams & Anderson, 1991). An example item is “I help others who have been absent”.

Statistical analyses. Confirmatory factor analyses (CFAs) and LPAs were performed following the guidance of analyses of latent profile similarity in multiple groups (Morin, Meyer, Creusier, & Biétry, 2016). CFAs were conducted to verify the factorial validity of all measures and their measurement invariance across samples, using the robust maximum likelihood estimator (MLR) available in Mplus 8 (Muthén & Muthén, 2017). Details of all measurement models and measurement invariance models are reported in the supplement Table 1. Factor scores (estimated with an SD of 1, and a grand mean of 0 across samples) were saved from the strict invariant (factor loadings, intercepts, residual) measurement models (Millsap, 2011) and used for subsequent main analyses because they are better indicators than scale scores. Briefly, factor scores ensure measure comparability across samples and reduce measurement errors to some extent by assigning higher weight to more credible items (Morin, Boudrias, Marsh, Madore, and Desrumaux, 2016).

LPA models were estimated based on factor scores of the four job crafting indicators. To ensure global maximum of model estimation, all LPA models were estimated using 5000 random sets of start values, 1000 iterations, and the 200 best solutions were retained for final stage optimization (Hipp & Bauer, 2006; Jung, & Wickrama, 2008). Starting from a single-profile model, LPA models with up to four profiles were estimated separately across samples.

A variety of statistical indicators were used to choose the best fit solution (McLachlan & Peel, 2000). Specifically, A lower value on the Akaike information criterion (AIC), Consistent AIC (CAIC), Bayesian information criterion (BIC), sample-size-adjusted BIC (SABIC), and a significant value on Lo-Mendell-Rubin likelihood ratio test (LMR), bootstrap likelihood ratio test (BLRT) indicate a favourable model. In addition, the entropy ranging from 0 to 1 indicates the precision of latent profiles extracted from the cases (Peugh, & Fan,

2013). Higher values close to 1 indicate better classification accuracy in the model. All these indicators needed to be taken into account to choose the best fitting model with optimal number of latent profiles. Additionally, theoretical meaning should be considered when selecting the best profile structure (Marsh et al., 2009).

Guided by Morin et al. (2016), the optimal LPA models in both samples were integrated into a single multigroup LPA model to form the configural similarity model, which is the first step to test profile similarity. Configural similarity would be supported if the same number of profiles could be ascertained in both samples. Next, we tested the structural similarity of profiles by forcing the means of job crafting profile indicators to equality across samples. In the third step, the dispersion similarity of job crafting profiles was verified by forcing the variances of job crafting profile indicators to equality across samples. Finally, we constrained the size of profiles to be equal across samples to test the distributional similarity.

After test of similarity of job crafting profiles across samples, we further included predictors and outcomes into the model to examine the predictive and explanatory similarity. Including covariates into LPA models is likely to influence the nature of job crafting profiles (Vermunt, 2010). To avoid changes in job crafting profiles, we use start values same with the retained similarity model in models including the covariates (Morin, 2016). We use multinomial logistic regressions to investigate how proactive personality and job autonomy are associated with job crafting profiles. To test predictive similarity, a similarity model which constrains the relationship of job crafting profiles with predictors to equality across samples was contrasted with a model without equality constrains in each sample. We tested explanatory similarity by putting equality constrains across samples on the within-profile means of outcome variables. At least two lower values on the CAIC, BIC, and ABIC for the similarity model than the freely estimated model support the predictive or explanatory similarity (Morin et al., 2016).

Results

Guided by the 6-step of multiple-groups latent profile similarity tests (Morin et al., 2016), we now report on the job crafting profile similarity, relations of job crafting profiles with predictors and outcomes to test our hypotheses.

Table 1
Fit Results from the Latent Profiles Analyses Conducted in Study 1

	Log likelihood	#fp	scaling	AIC	CAIC	BIC	SABIC	Entropy	LMR	BLRT
Class enumeration: The Netherlands										
1 profile	-1381.08	8	0.95	2778.16	2790.51	2809.02	2783.64	—	—	—
2 profiles	-1122.33	13	1.10	2270.66	2290.73	2320.81	2279.57	0.89	<0.001	<0.001
3 profiles	-1032.65	18	1.20	2101.29	2129.09	2170.74	2113.63	0.84	0.005	<0.001
4 profiles	-976.43	23	1.12	1998.87	2034.38	2087.60	2014.63	0.87	0.002	<0.001
Class enumeration: Germany										
1 profile	-1106.82	8	1.10	2229.63	2241.40	2259.15	2233.78	—	—	—
2 profiles	-962.74	13	1.41	1951.48	1970.61	1999.46	1958.23	0.77	0.012	<0.001
3 profiles	-887.50	18	1.26	1811.00	1837.48	1877.42	1820.34	0.87	0.020	<0.001
4 profiles	-834.24	23	1.42	1714.48	1748.32	1799.36	1726.42	0.86	0.138	<0.001
Cross-cultural similarity										
Configural	-2336.93	53	1.15	4779.85	4875.79	5016.80	4848.53	0.92	—	—
Structural	-2417.85	41	1.20	4917.70	4991.92	5101.00	4970.83	0.89	—	—
Structural (partial)	-2345.85	47	1.16	4785.69	4870.77	4995.82	4846.59	0.90	—	—
Dispersion	-2356.73	41	1.16	4795.47	4869.69	4978.77	4848.60	0.89	—	—
Distribution	-2367.48	39	1.23	4812.96	4883.56	4987.32	4863.50	0.89	—	—
Predictive Similarity										
Freely estimated across countries	-1659.77	63	1.14	3445.54	3551.40	3708.36	3508.40	0.90	—	—
Equality across countries	-1668.42	51	1.15	3438.85	3524.54	3651.60	3489.74	0.90	—	—
Explanatory similarity										
Freely estimated across countries	-5618.78	99	1.38	11435.56	11614.44	11877.40	11563.08	0.92	—	—
Equality across countries	-5516.17	84	1.27	11200.33	11352.11	11575.23	11308.53	0.93	—	—

Note: #fp = number of free parameters; AIC = Akaike information criterion; CAIC = constant AIC; BIC = Bayesian information criterion; SABIC = sample size adjusted BIC; LMR = *p* value associated with the adjusted Lo–Mendell–Rubin likelihood ratio test; BLRT = *p* value associated with the bootstrap likelihood ratio test.

Similarity of job crafting profiles. We examined LPA models including one- to four-profile solutions separately in both samples. Results of fit indices for these LPA models are reported in Table 1. In both samples, the values of BIC, CAIC, SABIC kept declining as the number of profiles increased, as would be expected. The LMR supported the three-profile

solution in Sample 2 as shown by the non-significant LMR value for the four-profile solution. In Sample 1, the LMR supported the four-profile solution, but in fact, only three profiles showed both quantitative and qualitative differences. Consequently, we adopted the three-profile solution as it was both the most meaningful empirical solution and was consistent with our theorizing. Thus, the configural similarity of job crafting profiles across the two samples was supported.

From the configural similarity model retained from the three-profile solution for each sample, we estimated the structural similarity model by including equality constrains on the within-profile means of the four job crafting indicators across the two samples. The structural similarity model showed higher values on CAIC, BIC and SABIC than the baseline configural similarity model, indicating structural differences in the three-profile solution across samples. After a careful examination of the job crafting profiles across the two samples, a partial structural similarity model was retained. Results showed that there were structural differences in active crafters across samples, as demonstrated by different levels of job crafting indicators across samples.

Next, based on the partial structural similarity model, we investigated the dispersion similarity and the distributional similarity. We evaluated the dispersion similarity model by including equality constrains on the within-profile variability of the job crafting indicators across samples. The lower values of CAIC and BIC supported the dispersion similarity of job crafting profile across samples. The final step was to examine the distributional similarity model by including equality constrains on the sizes of job crafting profiles across samples. The increased values on AIC, BIC and CAIC did not support the distributional similarity, which means that the sizes of the profiles differed across samples. Therefore, the dispersion similarity model was used for illustration and for predictive and explanatory similarity tests.

The profile solutions in each sample from the dispersion similarity model are illustrated

in Figure 1. As shown, the profile structure of proactive and reactive crafters is very similar across samples, although there were slight differences in some indicators. Compared to the Dutch sample, German proactive crafters engaged in higher levels of increasing structural job resources, while German reactive crafters showed higher levels of decreasing hindering job demands. With regard to active crafters, we have proposed that they used both the approach forms of crafting and decreasing hindering job demands without any particular preference. Therefore, considering the flexibility of active crafters, their structural differences across samples are not too surprising.

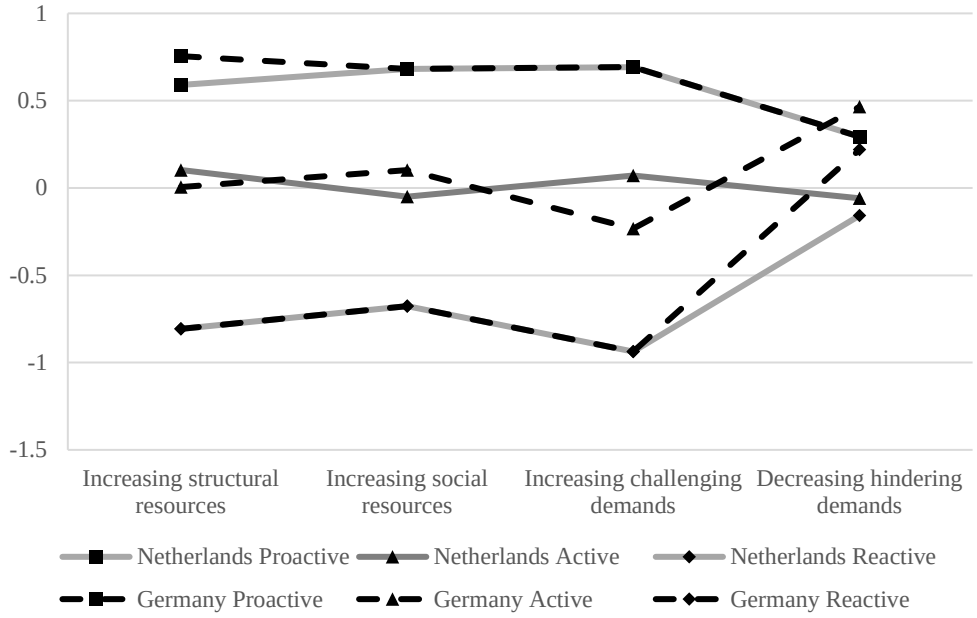


Figure 1: Job Crafting Profiles Identified in Study 1 at Both Samples

To statistically test the quantitative and qualitative differences in the job crafting profiles, we compared the levels of approach forms of crafting across three profiles, and the relative ordering of approach forms of crafting and decreasing hindering job demands within these profiles. Overall, results showed that proactive crafters had the highest levels of approach forms of crafting, followed by active crafters and then reactive crafters (see supplement Table S2). In terms of the qualitative differences, the results showed that proactive crafters reported more approach forms of crafting than decreasing hindering job

demands, and the opposite was true for reactive crafters (see supplement Table S3). Thus, Hypothesis 1 was supported.

The retained model yielded a high accurate classification (entropy value of .89). The high values on the correct membership assignment probabilities (from .90 to .97 in Sample 1 and from .90 to .95 in Sample 2) further supported the classification accuracy. As noted previously, there were variations regarding the sizes of three crafting profiles across samples. Specifically, results showed that proactive crafters and active crafters were more prevalent in German (39.9% and 48.9% of employees, respectively) than in Dutch (31.7% and 40.3% of employees, respectively). In contrast, reactive crafters appeared to be more prevalent in Dutch than in German (28.0% and 11.2% of employees, respectively).

Predictive similarity of job crafting profiles. Working based on the dispersion similarity model, which is the most similar model, predictors were then included into the model through a multinomial regression. Predictive similarity was supported as the similarity model with equality constrains showed lower values on CAIC, BIC, and SABIC than the freely estimated model (Table 1). Therefore, the relations of profile membership with predictors generalized across samples, despite some structural differences in job crafting profiles. The results again supported that the structures of job crafting profiles across samples were remarkably similar.

Table 2
Results from Multinomial Logistic Regressions for the Effects of the Predictors on Profile Membership in Study 1(Predictive Similarity)

	Profile 1 vs. Profile 3		Profile 2 vs. Profile 3		Profile 1 vs. Profile 2	
	Coef. (SE)	OR	Coef. (SE)	OR	Coef. (SE)	OR
Age	-0.14 (0.05) *	0.87	-0.05 (0.04)	0.95	-0.09 (0.05)	0.92
Gender	-0.20 (0.35)	0.82	-0.02 (0.29)	0.98	-0.17 (0.29)	0.84
Education	0.30 (0.28)	1.34	-0.23 (0.24)	0.80	0.52 (0.20) **	1.68
Tenure	-0.09 (0.09)	0.92	-0.03 (0.09)	0.97	-0.06 (0.08)	0.95
Proactive personality	6.14 (0.86) ***	463.17	2.79 (0.60) ***	16.32	3.35 (0.68) ***	28.38
Job autonomy	0.59 (0.28) *	1.80	0.40 (0.24) †	1.49	0.19 (0.24)	1.21

Note: $^{*}p < .05$. $^{**}p < .01$. $^{***}p<0.001$ $^{\dagger}p<0.10$
SE: Standard Error of the coefficient; OR: Odds ratio;
Profile 1: proactive crafter, Profile 2: active crafter, Profile 3: reactive crafter

The relations of job crafting profiles with indicators retained from the predictive similarity model are reported in Table 2. In terms of demographics, gender and tenure were uncorrelated with job crafting profile membership. As age increased, the likelihood of being a proactive crafter versus a reactive crafter decreased. Having a higher level of education increased the probability of being proactive rather than active crafters. As expected, the results showed that proactive employees have more chance to belong to proactive crafter profile instead of the reactive crafter profile (Hypothesis 2a) and the active crafter profile (Hypothesis 2c), and higher probability to be active crafters versus reactive crafters (Hypothesis 2b). Thus, Hypotheses 2a, 2b and 2c were supported.

Findings also indicated that as job autonomy increased, the probability of membership of the proactive crafter profile against the reactive crafter profile grew (Hypothesis 3a). However, job autonomy was uncorrelated with the likelihood of being in the active crafter profile as compared with the reactive crafter profile (Hypothesis 3b), and the probability to belong to the proactive crafter profile instead of the active crafter profile (Hypothesis 3c). Thus, only Hypothesis 3a was supported.

Explanatory similarity of job crafting profiles. From results in Table 1, the explanatory similarity was supported as the similarity model with equality constrains on within-profile means of outcomes showed lower values of CAIC, BIC, and ABIC than the freely estimated model. This indicates relations of job crafting profile membership with outcomes generalized across samples. Results of outcome means estimated in each profile and comparisons of mean-level differences in both samples are reported in Table 3. As shown, the most desirable levels on all outcomes (except task performance) were associated with proactive crafters, followed by active crafters and finally reactive crafters. The only

exception is task performance, which did not significantly differ between reactive and active crafters. Thus, Hypothesis 4 was largely supported.

In summary, the results support three meaningful job crafting profiles across samples. The structures of these profiles were very similar across samples despite minor differences in some indicators. The effects of predictors (i.e., proactive personality, job autonomy) on job crafting profile membership and the consequences (i.e., work engagement, task performance, OCB) of job crafting profiles also generalized across samples. A limitation of Study 1 is its cross-sectional design, which raises the common method bias problem and precludes the examination of longitudinal similarity in job crafting profiles. We conducted Study 2 to address these limitations and to gain further insights into job crafting profiles.

Table 3
Associations between Profile Membership and the Outcomes in Study 1 (Explanatory similarity)

Outcome	Proactive crafter (P1)	Active crafter (P2)	Reactive crafter (P3)	Tests of significance
Vigour	0.674	-0.350	-1.344	1>2>3
Dedication	0.781	-0.428	-1.750	1>2>3
Absorption	0.862	0.009	-1.161	1>2>3
Task performance	0.151	-0.148	-0.179	1>2=3
OCB	0.201	-0.126	-0.330	1>2>3

Study 2

To add more robustness into the job crafting profiles, we assessed the longitudinal similarity of job crafting profiles across two time points. To overcome the common method bias in Study 1, we replicated the relationship of job crafting profiles with predictors and outcomes, measured at different times, respectively. Specifically, we linked Time 2 job crafting profile membership with predictors at Time 1 and outcomes at Time 3.

Method

Participants and procedure. Data used in this study has previously been reported in two published papers (Tims, Bakker, & Derks, 2013, 2015). Tims et al. (2013) investigated whether job crafting is associated with employees' well-being (work engagement, burnout,

and job satisfaction) through changes in job resources and job demands. Tims et al. (2015) focused on whether job crafting intentions were related to employees' work engagement through actual job crafting, and whether work engagement mediated the relationship between employees' job crafting and performance (task performance and OCBI). Although our current study also aims to investigate how job crafting is associated with employees' work engagement and performance, and has overlapping variables with those two published papers, our Study 2 extends the previous two papers in several ways.

First, the two published papers studied crafting at the variable level and found crafting job resources and challenging job demands were associated with enhanced well-being and performance, whereas crafting hindering job demands was not significantly related to employees' well-being and performance. Conversely, this study adopts a person-centred approach, and investigated how different combination use of the four job crafting behaviours is related to different levels of employees' well-being and performance. Specifically, we found the consequences of crafting hindering job demands hinged upon to what extent employees also craft their job resources and challenging job demands (consistent with a profile rationale). Study 2 thus contributes to job crafting theory by highlighting significance to take all job crafting behaviours into account together, as a profile, rather than investigate them in isolation.

Second, this study extends Tims et al. (2013) that it investigates how job autonomy affects job crafting profiles rather than a change of job autonomy due to employees' job crafting. This study extends both papers by including T3 job crafting to investigate transitions of job crafting profile membership (T3 job crafting was not included in either of the two published papers). In sum, the current study addresses different research questions and results in different theoretical and managerial implications from previous two published papers.

Respondents were recruited from a chemical plant in the Netherlands. The plant makes

plastics and supplies them to the automotive and health care industries. All employees (N≈1250) received a standard invitation including description and confidentiality of the study, a personal login code and the survey link. The study was designed with three measurement times, measuring job autonomy at Time 1, job crafting at Time 2 and 3, work engagement, task performance and OCB at Time 3. The number of participants at T1, T2 and T3 was 564 (45.1%), 468 (37.4%) and 477 (38.1%), respectively. There were 288 participants in total who completed the surveys on all three occasions, which comprised the sample for this study. Participants were mainly male (82.6%), which is consistent with the gender distribution within the organization, with a mean age of 45.19 years (SD = 8.71). On average, participants had worked for 18.31 years (SD = 9.95) in this organization and worked 39.15 hours per week (SD = 6.81). With regard to educational level, 15% of the participants had primary or secondary education, 40% had vocational education, and 45% had higher degree in universities or colleges. Additional analyses showed that there were no significant differences in the demographic and the study variables between those who dropped out and those who finished all three surveys. Thus, the sample was deemed to be representative of the total population of 1250 individuals.

Measures. Job autonomy, job crafting, work engagement, task performance, and OCB were measured with the same scales used in Study 1. All Cronbach alpha values were acceptable, being above .70 (see supplement Table S8).

Statistical analyses. CFAs were conducted to verify the longitudinal measurement invariance of job crafting measures across the two time points. All models were estimated using the MLR estimator available in Mplus 8 (Muthén & Muthén, 2017). Details of longitudinal measurement invariance are provided in supplement Table 2. Same with Study 1, factor scores (estimated with an SD of 1, and a grand mean of 0) were saved from strict invariant (factor loadings, intercepts, residual) measurement models (Millsap, 2011) and used

for subsequent main analyses.

Longitudinal similarity of job crafting profiles was tested following strategies proposed by Morin et al. (2016). Starting from a single-profile solution, LPA models with up to four profiles were first conducted separately at each time point. Once the best fitting model was selected for the two waves, we then tested the longitudinal similarity of job crafting profiles following the same sequences as in Study 1: configural similarity, structural similarity, dispersion similarity and distributional similarity.

To make sure job crafting profiles remained unchanged by including covariates, we adopted a 3-step approach to estimate predictors and outcomes of job crafting profiles (Asparouhov & Muthén, 2013; Vermunt, 2010). Firstly, LPA was conducted to choose the best fitting model with optimal number of profiles. Next, the most likely class membership was retained relying on the posterior distribution in the first step. In the final stage, taking the most likely class membership and classification error into account, the relations of covariates with job crafting profiles were estimated. Multinomial logistic regressions were conducted to estimate relations of job crafting profiles with predictors through the R3STEP command available in Mplus (Asparouhov & Muthén, 2013). The regression results determine changes in the probability a person classified to one profile over another profile with changes of levels in predictors. We utilized the DU3STEP command available in Mplus (Asparouhov & Muthén, 2013) to estimate outcomes of job crafting profiles, which compares each profile on each outcome separately to determine significant differences between the compared groups.

Results

Below we reported results of the longitudinal similarity of job crafting profiles, predictors and outcomes of job crafting profile membership.

Longitudinal similarity of job crafting profiles. Results of fit indices for all LPA solutions in each time point are reported in Table 4. The indices (BIC, CAIC, SABIC) kept

declining as the number of profiles increased, as would be expected. The LMR supported the three-profile solution in both time points as shown by the non-significant values in the four-profile solution. Therefore, the configural similarity of job crafting profiles across time was supported. Next, the structural similarity of job crafting profiles across time was supported as the similarity model showed lower values on CAIC, BIC and SABIC than the configural model. Dispersion similarity and distributional similarity of job crafting profiles across time were both supported by lower values on CAIC and BIC. Thus, the distributional similarity model was retained for interpretation. This model resulted in a high classification accuracy of job crafting profiles with an entropy value of .85.

Table 4
Fit Results from the Latent Profiles Analyses and Latent Transition Analyses Conducted in Study 2

	Log likelihood	#fp	scaling	AIC	CAIC	BIC	SABIC	Entropy	LMR	BLRT
Time 2 Class enumeration										
1 profile	-1217.34	8	1.07	2450.69	2462.36	2479.99	2454.62	—	—	—
2 profiles	-1027.09	13	1.32	2080.19	2099.16	2127.81	2086.58	0.82	<0.001	<0.001
3 profiles	-945.18	18	1.36	1926.36	1952.63	1992.29	1935.21	0.85	0.029	<0.001
4 profiles	-896.41	23	1.37	1838.82	1872.39	1923.07	1850.13	0.86	0.099	<0.001
Time 3 Class enumeration										
1 profile	-1276.04	8	1.02	2568.07	2579.75	2597.37	2572.01	—	—	—
2 profiles	-1082.34	13	1.60	2190.67	2209.65	2238.29	2197.07	0.83	0.028	<0.001
3 profiles	-998.46	18	1.40	2032.92	2059.19	2098.86	2041.78	0.82	0.012	<0.001
4 profiles	-961.87	23	1.47	1969.73	2003.30	2053.98	1981.04	0.81	0.267	<0.001
Longitudinal transition analyses										
Configural similarity	-1864.44	52	1.27	3832.88	3908.77	4023.35	3858.45	0.86	—	—
Structural similarity	-1870.13	40	1.48	3820.27	3878.64	3966.79	3839.94	0.85	—	—
Dispersion similarity	-1876.38	28	1.86	3808.75	3849.61	3911.31	3822.52	0.85	—	—
Distribution similarity	-1876.73	26	1.98	3805.45	3843.39	3900.69	3818.24	0.85	—	—

Note: #fp = number of free parameters; AIC = Akaike information criterion; CAIC = constant AIC; BIC = Bayesian information criterion; SABIC = sample size adjusted BIC; LMR = *p* value associated with the adjusted Lo–Mendell–Rubin likelihood ratio test; BLRT = *p* value associated with the bootstrap likelihood ratio test.

The profile solutions from the distribution similarity model are illustrated in Figure 2. Consistent with Hypothesis 1, we found three job crafting profiles that differed both quantitatively and qualitatively. To statistically test these quantitative and qualitative differences in the profiles, we compared the levels of the approach forms of crafting across

these three profiles, and the relative ordering of approach forms of crafting and decreasing hindering job demands within the profiles. Overall, results showed that proactive crafters had the highest levels of approach forms of crafting, followed by active crafters and reactive crafters (see supplement Table S2). In terms of the qualitative differences, the findings revealed that proactive crafters used more approach forms of crafting than decreasing hindering job demands, and the opposite was true for reactive crafters (see supplement Table S3). Thus, Hypothesis 1 was supported in this study.

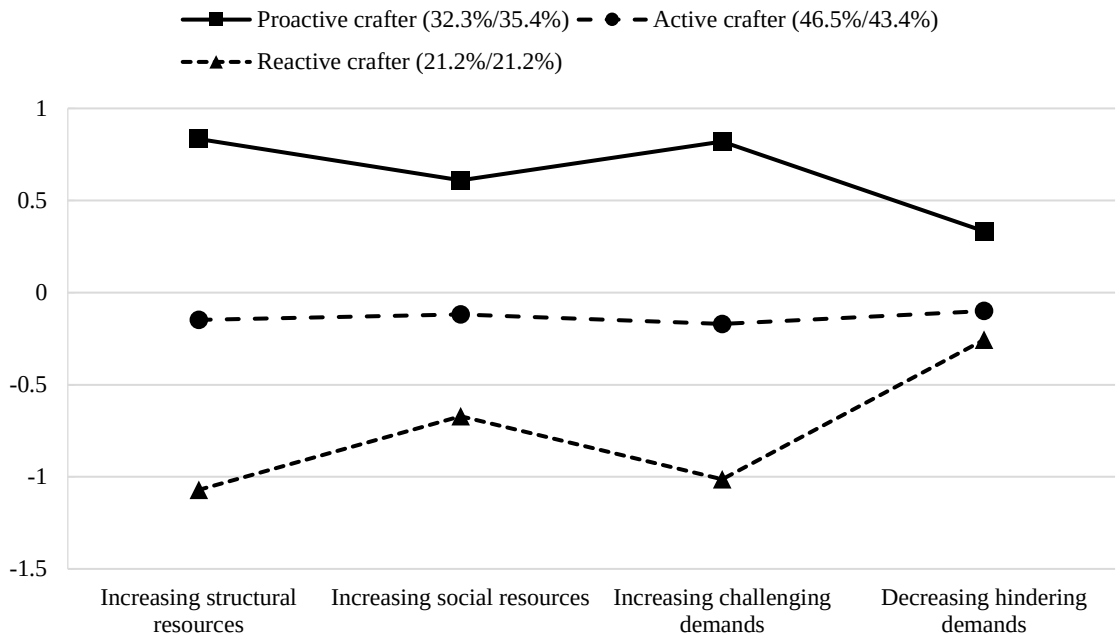


Figure 2: Job Crafting Profiles Transition Model from T2 To T3 in Study 2

The size of the three profiles remained fairly stable over time (see supplement Table S4), characterizing 32.3% and 35.4% of the proactive crafters at Time 2 and Time 3, 46.5% and 43.4% of the active crafters at Time 2 and Time 3, and 21.2% and 21.2% of the reactive crafters at Time 2 and Time 3. Although the relative sizes of the job crafting profiles remained stable, 29.9% of the participants (86 out of 288 employees) switched classes over time (see supplement Table S5).

Predictors and outcomes of job crafting profiles. As shown in Table 5, the multinomial logistic regression results showed that as job autonomy increased, the probability

increased that individuals belong to proactive profile over reactive profile (Hypothesis 3a) and active profile over reactive profile (Hypothesis 3b). However, job autonomy was uncorrelated with the probability of being in the proactive versus the active crafter profile (Hypothesis 3c). Therefore, Hypotheses 3a and 3b were supported, but Hypothesis 3c was not supported.

Table 5
Three-Step Results for Antecedents of Job Crafting Profile Membership in Study 2 and 3

	1 vs. 3		2 vs. 3		1 vs. 2	
Predictor	Coef. (SE)	OR	Coef. (SE)	OR	Coef. (SE)	OR
Job autonomy	1.19 (0.28) ***	3.29	0.80 (0.23) ***	2.23	0.39 (0.27)	1.48

Note: OR=Odds ratio; SE=Standard Error of the coefficient; 1=proactive crafter; 2=active crafter; 3=reactive crafter,
* $p<0.05$, ** $p<0.01$, *** $p<0.001$

As Table 6 indicates, proactive crafters demonstrated the highest level of work engagement, followed by active then reactive crafters. Proactive crafters also had the highest score on task performance compared to the other two profiles, but there were no significant differences between active and reactive crafters. In terms of OCB, proactive crafters had higher levels than reactive crafters, but no significant differences were found between active versus reactive crafters, nor between proactive and active crafters. Thus, Hypothesis 4 was partially supported.

Table 6
Outcome Means and Pairwise Comparisons between Profiles in Study 2 and 3

	Profile means			Profile comparisons				Summary of comparisons
	P1	P2	P3	Global χ^2	1 vs. 3	2 vs. 3	1 vs. 2	
Work engagement	5.16	4.39	3.79	46.65***	45.66***	9.82**	18.31***	1>2>3
Task performance	4.37	4.16	4.09	10.91**	10.10***	0.82	6.55*	1>2=3
OCB	4.16	3.97	3.80	13.69***	13.50***	2.78	2.43	1>3, 2=3,1=2

Note: P1=proactive crafter; P2=active crafter; P3=reactive crafter, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

In summary, the results showed the generalizability of job crafting profiles across time, and largely replicated the results for predictors and outcomes of job crafting profiles from Study 1.

General Discussion

Job crafting research to date been subject to inconsistent theoretical views and empirical findings regarding the avoidance form of decreasing hindering job demands. In the current study using five independent samples, we used a person-centred approach, instead of the traditional variable-centred approach, to reconcile the role and effect of the construct of decreasing hindering job demands.

Theoretical Contributions

A key theoretical contribution of this article is that we theorized, and showed, that different subpopulations of employees engage in different clusters of job crafting strategies. We found three job crafting profiles that were both quantitatively and qualitatively distinct. The results showed that most employees decrease hindering job demands to some degree, but the major differentiation among the three profiles is the extent to which they also engage in approach forms of crafting. Proactive crafters engage in the highest level of approach forms of crafting, followed by active crafters and then reactive crafters. Our results provide empirical support to Zhang and Parker's (2019) idea that decreasing hindering job demands functions like either part of a proactive goal or a passive withdrawal behaviour, which underscores the need for future studies to assess job crafting combinations in ways which complement and extend our three studies' results.

Second, our three studies reconcile the literature's inconsistent theory and findings on decreasing hindering job demands by investigating job crafting combinations. We argued that the 'function' of hindering job demands appears to vary depending on whether it is part of an overall proactive strategy engaged in by proactive individuals to accumulate resources, or a withdrawal behaviour engaged in by individuals to prevent resource loss. The results supported our argument and highlighted that the increased use of approach forms of crafting alongside decreasing hindering job demands resulted in higher work engagement, task

performance and OCB. Thus, our studies extend prior job crafting theories and provide important insight into the role and effect of decreasing hindering job demands, indicating whether it is proactive or avoidant depending on the employee's combined use of other approach forms of crafting. Taken together, our results suggest that the dominant use of strategies to decrease hindering job demands, without complementary approach forms of crafting, likely constitute avoidant behaviour.

Third, these three studies provide a new perspective to investigate factors that influence job crafting. Unlike the variable-centred results showing that a proactive personality is negatively associated with decreasing hindering job demands (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017; Zhang & Parker, 2019), our person-centred approach reveals that proactive employees also decrease hindering job demands somewhat, but they use this strategy alongside higher or at least comparative levels of approach forms of crafting. Moreover, job autonomy consistently differentiated proactive crafters from reactive ones, but not proactive from active crafters, nor active from reactive crafters. As job autonomy and job crafting are reciprocally correlated (Petrou et al., 2012; Tims & Bakker, 2010; Tims, Bakker, & Derks, 2013), the results might be limited in cross-sectional research designs, indicating future research opportunities. Overall, our results reveal that the effect of a proactive personality and job autonomy is not only to promote approach forms of crafting, but to stimulate employees to balance the use of all job crafting strategies.

Finally, to maximize the generalizability of job crafting profiles, we systematically examined the similarity of job crafting profiles across samples and time. We found job crafting profiles with remarkably similar structures in two different samples and across two time points. We also found the role of predictors in influencing job crafting profiles and consequences of job crafting profiles generalized across two independent samples. In sum, these findings strengthen the robustness of our studies.

Practical Implications

Organizations can use the job crafting profiles to better manage and support employees with different job crafting profiles. For example, with the awareness that the proactive job crafting profile leads to the most desirable outcomes, organizations should encourage employees to increase the use of approach forms of crafting and keep the use of decreasing hindering job demands at a moderate level. Interventions based on the variable-centred approach often aim to improve a specific type of job crafting (e.g., approach crafting) without taking other forms of crafting into account (e.g., avoidance crafting). For example, according to research findings using the variable-centred approach of job crafting, job crafting interventions should not encourage the use of decreasing hindering job demands as it has been indicated to be detrimental (Kooij, van Woerkom, Wilkenloh, Dorenbosch, & Denissen, 2017). Existing intervention studies guide participants to engage in the four job crafting behaviours, without pointing out the potential risk of using decreasing hindering job demands strategy and how to avoid its negative effect when adopting this strategy (e.g., van den Heuvel, Demerouti, & Peeters, 2015). Some interventions did not teach participants the strategy of decreasing hindering job demands (e.g., van Wingerden, Bakker, & Derks, 2016, 2017). The person-centred approach provides a more complete and unbiased description on employee use of job crafting strategies, thus enabling managers and practitioners to design more effective interventions. In particular, we recommend that employees can be taught to use decreasing hindering job demands, for example, to protect them from becoming overwhelmed, but they need to be aware of the complementary necessity of engaging in approach forms of job crafting at the same time to achieve optimal results.

With regard to the antecedents of profile membership considered in this article, proactive personality is a relatively stable characteristic that is less likely to be affected by interventions. However, we suggest that organizations could try to provide employees with

job autonomy to increase their likelihood of being proactive and active crafters.

Limitations and Future Directions

An initial limitation of this research is that all measures in our studies were rated from one source (i.e., employees), which raises the risk of common method bias. However, as job crafting is self-initiated behaviour which might not be easily observed by others, it can be usefully evaluated by using self-reports, therefore the job crafting profiles are unlikely to be influenced by common method variance. Also, to help address the issue of common method bias, we included a three-wave time-lagged study in which antecedents and outcomes of job crafting profiles were collected at different times. Nevertheless, further studies should collect data from additional sources (e.g., supervisors), especially on outcome variables like performance, to provide more robust results.

Second, although we investigated the antecedents and outcomes of job crafting profiles, there was insufficient evidence to point to a causal direction between these variables. However, our primary purpose in this paper was not to show the causal relationships of these variables but to understand different job crafting profiles and how job crafting membership relates to predictors and outcomes. Future studies could use longitudinal research designs to investigate these variables' causal relationships. For example, the variable-centred approach of job crafting research has shown that work engagement and approach forms of crafting were reciprocally related (Vogt, Hakanen, Brauchli, Jenny, & Bauer, 2016), while decreasing hindering job demands was reciprocally related to burnout (Petrou et al., 2015). However, little is known about how the combined use of approach job crafting strategies and decreasing hindering job demands are causally related to employee work engagement and burnout. Consistent with our results in the studies presented here, it is expected that the longitudinal effect of decreasing hindering job demands will vary depending on the extent of using approach forms of crafting as well. This means that employees who rely primarily on

decreasing hindering demands could be trapped in a vicious cycle where decreasing hindering job demands and burnout strengthen each other. In contrast, employees who use deceasing hindering job demands alongside high levels of approach forms of crafting may not suffer from the negative effects of the former.

Finally, our study showed that some individuals switched membership between different job crafting profiles within one month, but it did not focus on the effects of these changes and what factors influence profile membership transitions of different types. Further investigation is needed on the predictors and outcomes of profile transition to provide additional insights into job crafting research and interventions. As shown in our studies, proactive crafters showed the most favourable work engagement, task performance and OCB, so it is expected that an employee's move into a proactive profile will result in better well-being and performance. Similarly, a change to becoming a reactive crafter may lead to a decrease in employee well-being and performance. Future studies could investigate the effects of job crafting profile transition especially over a longer time period than the one-month timeframe of the current study.

As a proactive profile is the most favourable job crafting profile, effort should be put into investigating the factors which influence changes of job crafting profile membership. From our results, it could be assumed that the increase of job resources would promote a transition to a proactive profile. Extending on prior job crafting research (Guan & Frenkel, 2018; Meijerink et al., 2018), future studies can also investigate how human resource practices affect the transition of job crafting profile membership.

References

Asparouhov, T., & Muthén, B. (2013). *Auxiliary variables in mixture modeling: 3-Step approaches using Mplus* [Technical report comment]. Retrieved from http://www.statmodel.com/download/3stepOct28.pdf

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, *22*(3), 309-328.

Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B., & Schreurs, P. J. (2003). A multigroup analysis of the job demands-resources model in four home care organizations. *International Journal of Stress Management*, *10*(1), 16-38.

Bakker, A. B., Rodríguez-Muñoz, A., & Sanz Vergel, A. I. (2016). Modelling job crafting behaviours: Implications for work engagement. *Human Relations*, *69*(1), 169-189.

Bakker, A. B., Tims, M., & Derks, D. (2012). Proactive personality and job performance: The role of job crafting and work engagement. *Human Relations*, *65*(10), 1359-1378.

Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behaviour: A measure and correlates. *Journal of Organizational Behaviour*, *14*(2), 103-118.

Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013). Job crafting and meaningful work. In B.J. Dik, Z. S. Byrne & M. F. Steger (Eds.), *Purpose and meaning in the workplace* (pp. 81-104). Washington, DC: American Psychological Association.

Berg, J. M., Wrzesniewski, A., & Dutton, J. E. (2010). Perceiving and responding to challenges in job crafting at different ranks: When proactivity requires adaptivity. *Journal of Organizational Behaviour*, *31*(2-3), 158-186.

Bindl, U. K., Unsworth, K. L., Gibson, C. B., & Stride, C. B. (2019). Job crafting revisited: Implications of an extended framework for active changes at work. *Journal of Applied Psychology*, *104*(5), 605-628.

Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner &

J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137-164). Newbury Park, CA: Sage.

Bruning, P., & Campion, M. (2018). A role-resource approach-avoidance model of job crafting: A multi-method integration and extension of job crafting theory. *Academy of Management Journal*, *61*(2), 499-522.

Chen, C. Y., Yen, C. H., & Tsai, F. C. (2014). Job crafting and job engagement: The mediating role of person-job fit. *International Journal of Hospitality Management*, *37*, 21-28.

Cullinane, S. J., Bosak, J., Flood, P. C., & Demerouti, E. (2017). Job crafting for lean engagement: The interplay of day and job-level characteristics. *European Journal of Work and Organizational Psychology*, *26*(4), 541-554.

Demerouti, E. (2014). Design your own job through job crafting. *European Psychologist*, *19*(4), 237-247.

Demerouti, E., Bakker, A. B., & Gevers, J. M. (2015). Job crafting and extra-role behaviour: The role of work engagement and flourishing. *Journal of Vocational Behaviour*, *91*, 87-96.

Demerouti, E., Bakker, A. B., & Halbesleben, J. R. (2015). Productive and counterproductive job crafting: A daily diary study. *Journal of Occupational Health Psychology*, *20*(4), 457-469.

Guan, X., & Frenkel, S. (2018). How HR practice, work engagement and job crafting influence employee performance. *Chinese Management Studies*, *12*(3), 591-607.

Hetland, J., Hetland, H., Bakker, A. B., & Demerouti, E. (2018). Daily transformational leadership and employee job crafting: The role of promotion focus. *European Management Journal*, *36*(6), 746-756.

Hipp, J. R., & Bauer, D. J. (2006). Local solutions in the estimation of growth mixture models. *Psychological Methods*, 11, 36-53.

Hobfoll, S. E. 1989. Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44*: 513–524.

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology*, *50*(3), 337-421.

Hobfoll, S. E. 2002. Social and psychological resources and adaptation. *Review of General Psychology, 6*:307–324.

Jung, T., & Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Social and Personality Psychology Compass*, *2*(1), 302-317.

Kim, H., Im, J., & Qu, H. (2018). Exploring antecedents and consequences of job crafting. *International Journal of Hospitality Management*, *75*, 18-26.

Kooij, D. T., van Woerkom, M., Wilkenloh, J., Dorenbosch, L., & Denissen, J. J. (2017). Job crafting towards strengths and interests: The effects of a job crafting intervention on person–job fit and the role of age. *Journal of Applied Psychology*, *102*(6), 971-981.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology*, *58*(2), 281-342.

Lichtenthaler, P. W., & Fischbach, A. (2019). A meta-analysis on promotion-and prevention-focused job crafting. *European Journal of Work and Organizational Psychology*, *28*(1), 30-50.

Lu, C. Q., Wang, H. J., Lu, J. J., Du, D. Y., & Bakker, A. B. (2014). Does work engagement increase person–job fit? The role of job crafting and job insecurity. *Journal of Vocational Behaviour*, *84*(2), 142-152.

Mäkikangas, A. (2018). Job crafting profiles and work engagement: A person-centred approach. *Journal of Vocational Behaviour*, *106*, 101-111.

Marsh, H. W., Lüdtke, O., Trautwein, U., & Morin, A. J. (2009). Classical latent profile analysis of academic self-concept dimensions: Synergy of person-and variable-centred approaches to theoretical models of self-concept. *Structural Equation Modeling: A Multidisciplinary Journal*, *16*(2), 191-225.

McLachlan, G., & Peel, D. (2000). *Finite mixture models*. New York, NY: Wiley.

Meijerink, J., Bos-Nehles, A., & de Leede, J. (2018). How employees' pro-activity translates high-commitment HRM systems into work engagement: the mediating role of job crafting. *The International Journal of Human Resource Management*, 1-26.

Millsap, R. E. (2011). *Statistical approaches to measurement invariance*. New York, NY: Taylor & Francis.

Morin, A. J., Boudrias, J. S., Marsh, H. W., Madore, I., & Desrumaux, P. (2016). Further reflections on disentangling shape and level effects in person-centred analyses: An illustration exploring the dimensionality of psychological health. *Structural Equation Modeling: A Multidisciplinary Journal*, *23*(3), 438-454.

Morin, A. J., Meyer, J. P., Creusier, J., & Biétry, F. (2016). Multiple-group analysis of similarity in latent profile solutions. *Organizational Research Methods*, *19*(2), 231-254.

Muthén, B. O. (2004). Latent variable analysis: Growth mixture modeling. In D. Kaplan (Ed.), *Handbook of quantitative methodology for the social sciences* (pp. 345-368). Newbury Park, CA: Sage.

Muthén, B. O., & Muthén, L. K. (2000). Integrating person-centred and variable-centred analysis: Growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research, 24*, 882–891.

Muthén, L.K. and Muthén, B.O. (1998-2017). *Mplus user's guide*. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Parker, S. K., & Collins, C. G. (2010). Taking stock: Integrating and differentiating multiple

proactive behaviours. *Journal of Management*, *36*(3), 633-662.

Petrou, P., Demerouti, E., Peeters, M. C., Schaufeli, W. B., & Hetland, J. (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behaviour*, *33*(8), 1120-1141.

Petrou, P., Demerouti, E., & Schaufeli, W. B. (2015). Job crafting in changing organizations: Antecedents and implications for exhaustion and performance. *Journal of Occupational Health Psychology*, *20*(4), 470.

Peugh, J., & Fan, X. (2013). Modeling unobserved heterogeneity using latent profile analysis: A Monte Carlo simulation. *Structural Equation Modeling: A Multidisciplinary Journal*, *20*(4), 616-639.

Rastogi, M., & Chaudhary, R. (2018). Job crafting and work-family enrichment: The role of positive intrinsic work engagement. *Personnel Review*, *47*(3), 651-674.

Rudolph, C., Katz, I., Lavigne, K., & Zacher, H. (2017). Job crafting: A meta-analysis of relationships with individual differences, job characteristics, and work outcomes. *Journal of Vocational Behaviour*, *102*, 112-138.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, *66*(4), 701-716.

Sekiguchi, T., Li, J., & Hosomi, M. (2017). Predicting job crafting from the socially embedded perspective: The interactive effect of job autonomy, social skill, and employee status. *The Journal of Applied Behavioural Science*, *53*(4), 470-497.

Slemp, G. R., & Vella-Brodrick, D. A. (2014). Optimising employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-

being. *Journal of Happiness Studies*, *15*(4), 957-977.

Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology*, *36*(2), 1-9.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behaviour*, *80*(1), 173-186.

Tims, M., Bakker, A. B., & Derks, D. (2013). The impact of job crafting on job demands, job resources, and well-being. *Journal of Occupational Health Psychology*, *18*(2), 230.

Tims, M., B. Bakker, A., & Derks, D. (2014). Daily job crafting and the self-efficacy–performance relationship. *Journal of Managerial Psychology*, *29*(5), 490-507.

Tims, M., Bakker, A. B., & Derks, D. (2015). Job crafting and job performance: A longitudinal study. *European Journal of Work and Organizational Psychology, 24*(6), 914-928.

Tims, M., Derks, D., & Bakker, A. B. (2016). Job crafting and its relationships with person–job fit and meaningfulness: A three-wave study. *Journal of Vocational Behaviour*, *92*, 44-53.

Van den Heuvel, M., Demerouti, E., & Peeters, M. C. (2015). The job crafting intervention: Effects on job resources, self-efficacy, and affective well-being. *Journal of Occupational and Organizational Psychology, 88*(3), 511-532.

Van Wingerden, J., Bakker, A. B., & Derks, D. (2016). A test of a job demands-resources intervention. *Journal of Managerial Psychology*, *31*(3), 686-701.

Van Wingerden, J., Derks, D., & Bakker, A. B. (2017). The impact of personal resources and job crafting interventions on work engagement and performance. *Human Resource Management*, *56*(1), 51-67.

Van Wingerden, J. V., & Poell, R. F. (2017). Employees' perceived opportunities to craft and in-role performance: the mediating role of job crafting and work engagement. *Frontiers*

in Psychology, *8*, 1876.

Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political Analysis, 18,* 450–469.

Vogt, K., Hakanen, J. J., Brauchli, R., Jenny, G. J., & Bauer, G. F. (2016). The consequences of job crafting: A three-wave study. *European Journal of Work and Organizational Psychology*, *25*(3), 353-362.

Wang, M., & Hanges, P. J. (2011). Latent class procedures: Applications to organizational research. *Organizational Research Methods, 14*(1), 24-31.

Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviours. *Journal of Management*, *17*(3), 601-617.

Wright, T. A., & Cropanzano, R. (1998). Emotional exhaustion as a predictor of job performance and voluntary turnover. *Journal of Applied Psychology*, *83*(3), 486.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*(2), 179-201.

Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour*, *40*(2), 126-146.

Appendix: Data Transparency Table

Variables used in each study		Variables used in each study		
Study 1 (Current)	Akkermans & Tims (2017)	**Study 2 (Current)**	Tims, Bakker, & Derks (2013)	Tims, Bakker, & Derks (2015)
Job crafting	Job crafting	Job crafting T2 & T3	Job crafting (T2)	Job crafting (T2)
Proactive personality	x			
Autonomy	x	Autonomy T1	Autonomy *Δ*T1&T3	T1 is control variable
Work engagement	x	Work engagement T3	Work engagement *Δ*T1&T3	Work engagement T3 T1 is control
Job performance	x	Job performance T3	x	Job performance T3 T1 is control
OCB	x	OCB T3	x	OCB T3 T1 is control
x	Career competencies	x	x	Job crafting intentions T1
x	Employability	x	Developmental opportunities *Δ*T1&T3	T1 is control
x	Work-home interference/enrichment		Variety *Δ*T1&T3	T1 is control
x	Control: Gender	x	Feedback *Δ*T1&T3	T1 is control
x	Control: Number of working hours	x	Coaching *Δ*T1&T3	T1 is control
			Social support *Δ*T1&T3	T1 is control
		x	Workload *Δ*T1&T3	T1 is control
		x	Cognitive demands *Δ*T1&T3	T1 is control
		x	Emotional demands *Δ*T1&T3	T1 is control
		x	Burnout *Δ*T1&T3	T1 is control
		x	Job satisfaction *Δ*T1&T3	T1 is control

Akkermans, J., & Tims, M. (2017). Crafting your career: How career competencies relate to career success via job crafting. *Applied Psychology*, *66*(1), 168-195.
Tims, M., Bakker, A. B., & Derks, D. (2013). The impact of job crafting on job demands, job resources, and well-being. *Journal of Occupational Health Psychology*, *18*(2), 230.
Tims, M., Bakker, A. B., & Derks, D. (2015). Job crafting and job performance: A longitudinal study. *European Journal of Work and Organizational Psychology*, *24*(6), 914-928.

Supplement Material: Preliminary Confirmatory Factor Analyses

Confirmatory factor analyses (CFAs) were conducted to verify the factorial validity of all measures and their measurement invariance in Mplus 8 (Muthén & Muthén, 2017). In Study 1, we conducted separate CFAs for job crafting, variables of predictors and the outcomes because it is complex to estimate measurement models including all variables in multiple samples. The job crafting models included, in each sample, four factors for increasing structural job resources, increasing social job resources, increasing challenging job demands, and decreasing hindering job demands. The predictor models included, in each sample, two factors related to proactive personality and job autonomy. Finally, the outcome models included five factors related to vigour, dedication, absorption, task performance and OCB. In Study 2, longitudinal models were estimated across both time waves including a total of 8 job crafting factors (4 factors × 2 time waves).

All models were evaluated using the robust maximum likelihood estimator (MLR) available in Mplus 8 (Muthén & Muthén, 2017) to address the non-normality issue in the data (Finney & DiStephano, 2013). Full Information MLR estimation (FIML; Enders, 2010; Graham, 2009) was used to make use of data from all respondents regardless of missing data. FIML estimation has been recognized as the most practical approach to estimate missing data as it provides unbiased estimation even there is a very high percentage of missing data (e.g., 50%) (Enders, 2010; Graham, 2009; Larsen, 2011; Shin, Davidson, & Long, 2009).

To ensure measure comparability across different samples and time points, we tested their measurement invariance in the following four steps (Meredith, 1993; Milfont & Fischer, 2010; Millsap, 2011). First, configural invariance was verified by examining whether patterns of item loadings on the latent variables are the same across samples or time points. Second, weak invariance was tested by including equality constrains on factor loadings across samples or time points. Next, strong invariance was tested by including equality constrains on

item intercepts across samples or time points. Finally, strict invariance was tested by constraining item residuals to be equal across samples or time points. In each sequence of invariance, the preceding model served as reference. After the measurement invariance been verified, factor scores were saved for subsequent main LPA analyses.

A variety of indices were used to determine optimal model fit: the chi-square (χ^2), the root mean square error of approximation (RMSEA), the 90% confidence interval of the RMSEA, the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the standardized root mean square residual (SRMR) (Hu & Bentler, 1999; Marsh, Hau, & Grayson, 2005). To support an adequate model, CFI and TLI values should be greater than .90, RMSEA should smaller than .08, and the SRMR should smaller than .10. In the context of comparing measurement invariance models, research has favored CFIs and RMSEAs over chi-square difference tests which is sensible to sample size and minor model misspecifications (Chen, 2007; Cheung & Rensvold, 2002). To support measurement invariance, the change of CFI should be no greater than .01, and the change of RMSEA should be no greater than .015 when contrasted the restricted model to the preceding model.

Results from all measurement models and measurement invariance models are reported in supplementary Table S1. The results for job crafting measurement models, predictor models and outcomes models in Study 1 support the weak invariance but not the strong invariance. After a careful examination of parameters in the weak invariance models and modification indices in the strong invariance models, we found that the non-invariance of job crafting measurement models was mainly related to the intercepts of two items (one related to increasing structural job resources, and one related to increasing social job resources), the non-invariance of predictor measurement models was mainly related to the intercepts of one item associated with proactive personality, and the non-invariance of outcome measurement models was mainly related to the intercepts of two items (one related to dedication, and one

related to absorption). Thus, we retained models of partial strong invariance by relaxing the invariance constraints on these items. The strict invariance measurement models for job crafting, predictors and outcomes were supported.

Results from job crafting measurement models in Study 2 support the measurement invariance (configural, weak, strong, strict) across time waves as none of the CFIs and RMSEAs exceeding the recommended cut-off scores.

Factor scores (estimated with an SD of 1, and a grand mean of 0 across samples) in Study 1 and Study 2 were saved from the strict invariance measurement models and used for subsequent main LPA analyses.

References Used in This Supplement

Chen, F.F. (2007). Sensitivity of goodness of fit indexes to lack of measurement. *Structural Equation Modelling*, *14*, 464–504.

Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of fit indexes for testing measurement invariance. *Structural Equation Modelling*, *9*, 233–255.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford.

Finney, S.J., & DiStefano, C. (2013). Non-normal and categorical data in structural equation Modelling. In G.R. Hancock & R.O. Mueller (Eds), *Structural Equation Modelling: A Second Course, 2nd edition* (pp. 439-492). Greenwich, CO: IAP.

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, *60*, 549-576.

Hu, L.-T., & Bentler, P.M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling*, *6*, 1–55.

Larsen, R. (2011). Missing data imputation versus full information maximum likelihood with second level dependencies. *Structural Equation Modelling*, *18*, 649-662.

Marsh, H. W., Hau, K., & Grayson, D. (2005). Goodness of fit in structural equation models. In A. Maydeu-Olivares & J.J. McArdle (Eds.), *Contemporary psychometrics: A festschrift for Roderick P. McDonald.* (pp. 275-340). Mahwah, NJ: Erlbaum.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, *58*(4), 525-543.

Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, *3*(1), 111-130.

Millsap, R.E. (2011). *Statistical approaches to measurement invariance*. NewYork: Taylor &

Francis.

Muthén, L.K. and Muthén, B.O. (1998-2017). *Mplus user's guide*. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Shin, T., Davison, M. L., & Long, J. D. (2009). Effects of missing data methods in structural equation Modelling with non-normal longitudinal data. *Structural Equation Modelling: A Multidisciplinary Journal*, *16*(1), 70-98.

Supplement Tables

Table S1

Goodness-of-Fit Statistics of the Preliminary Confirmatory Factor Analyses Conducted in Study 1 and Study 2

Model	MLRχ^2(df)	CFI	TLI	RMSEA	RMSEA 90% CI	SRMR	AIC	CAIC	BIC	SABIC
Study 1										
Job Crafting: A priori 4-facotr model										
The Netherlands	369.13*(181)	0.92	0.91	0.05	[0.05, 0.06]	0.06	18051.13	18160.76	18325.05	18099.81
Germany	319.79*(181)	0.91	0.89	0.05	[0.04, 0.06]	0.06	15609.99	15714.45	15872.01	15646.84
Job Crafting: Multiple-Group measurement invariance										
Configural invariance	687.34*(362)	0.92	0.90	0.05	[0.04, 0.06]	0.06	33661.12	33918.18	34295.98	33845.13
Weak invariance	704.49*(379)	0.91	0.90	0.05	[0.05, 0.06]	0.06	33645.55	33871.83	34204.40	33807.53
Strong invariance	839.83*(396)	0.88	0.88	0.06	[0.05, 0.06]	0.07	33761.73	33957.23	34244.57	33901.68
Partial strong invariance	775.28*(394)	0.90	0.89	0.06	[0.05, 0.06]	0.06	33692.71	33891.83	34184.49	33835.25
Strict invariance	808.27*(413)	0.90	0.89	0.05	[0.05, 0.06]	0.07	33694.29	33859.02	34101.13	33812.21
Predictor measurement models										
Configural invariance	179.01*(68)	0.94	0.92	0.07	[0.06, 0.08]	0.05	13931.09	14043.32	14208.28	14011.43
Weak invariance	182.68*(76)	0.94	0.93	0.07	[0.05, 0.08]	0.06	13922.11	14019.87	14163.54	13992.09
Strong invariance	229.19*(84)	0.92	0.91	0.07	[0.06, 0.08]	0.07	13956.00	14039.27	14161.66	14015.61
Partial strong invariance	211.76*(83)	0.93	0.92	0.07	[0.06, 0.08]	0.07	13938.63	14023.71	14148.76	13999.53
Strict invariance	232.11* (93)	0.92	0.93	0.07	[0.06, 0.08]	0.10	13952.15	14019.13	14117.57	14000.09
Outcome measurement models										
Configural invariance	915.13*(358)	0.91	0.89	0.07	[0.06, 0.08]	0.06	27586.37	27850.66	28236.83	27773.29
Weak invariance	929.29*(374)	0.91	0.89	0.07	[0.06, 0.07]	0.07	27576.67	27812.00	28155.85	27743.11
Strong invariance	1060.58*(390)	0.89	0.88	0.07	[0.07, 0.08]	0.08	27701.55	27907.92	28209.44	27847.50
Partial strong invariance	996.66*(388)	0.90	0.89	0.07	[0.06, 0.08]	0.07	27624.26	27834.24	28141.06	27772.77
Strict invariance	1095.84*(408)	0.89	0.88	0.07	[0.07, 0.08]	0.10	27770.22	27944.00	28197.92	27893.13
Study 2: Job crafting longitudinal measurement invariance										
Configural invariance	1283.72*(770)	0.91	0.90	0.05	[0.04, 0.05]	0.06	27991.49	28246.88	28632.51	28077.56
Weak invariance	1301.47*(787)	0.91	0.90	0.05	[0.04, 0.05]	0.06	27978.90	28209.48	28557.64	28056.61
Strong invariance	1341.13*(808)	0.91	0.90	0.05	[0.04, 0.05]	0.06	27976.70	28176.63	28478.52	28044.08
Strict invariance	1371.93*(829)	0.90	0.90	0.05	[0.04, 0.05]	0.06	27973.03	28142.32	28397.93	28030.08

Note. MLR χ^2 = chi square test of model fit associated with the robust Maximum Likelihood estimator; df= degrees of freedom; CFI = Comparative fit index; TLI = Tucker-Lewis index; RMSEA = Root mean square error of approximation; 90% CI = 90% Confidence Interval for the RMSEA; SRMR = Standardized Root Mean Square Residual; AIC = Akaïke information criterion; CAIC = Consistent AIC; BIC = Bayesian information criterion; SABIC = Sample-size adjusted BIC; * $p < 0.01$.

Table S2

Quantitative Differences among Job Crafting Profiles

	Proactive crafter (P.1)	Active crafter (P.2)	Reactive crafter (P.3)	Summary of comparisons
Study 1_Sample 1				
Increasing structural resources	0.59	0.10	-0.09	1>2>3, p<0.001
Increasing social resources	0.68	-0.05	-0.68	1>2>3, p<0.001
Increasing challenging demands	0.69	0.07	-0.94	1>2>3, p<0.001
Study 1_Sample 2				
Increasing structural resources	0.10	0.01	-0.09	1>2>3, p<0.001
Increasing social resources	0.68	0.10	-0.68	1>2>3, p<0.001
Increasing challenging demands	0.69	-0.23	-0.94	1>2>3, p<0.001
Study 2				
Increasing structural resources	0.83	-0.15	-1.07	1>2>3, p<0.001
Increasing social resources	0.61	-0.12	-0.67	1>2>3, p<0.001
Increasing challenging demands	0.82	-0.17	-1.01	1>2>3, p<0.001

Table S3

Qualitative Differences among Job Crafting Profiles

	Approach crafting	Decreasing hindering job demands	Summary of comparisons
Study 1_Sample 1			
Proactive crafter (P1)	0.66	0.29	A>D, p<0.001
Reactive crafter (P3)	-0.57	-0.16	A<D, p<0.001
Study 1_Sample 2			
Proactive crafter (P1)	0.49	0.29	A>D, p<0.001
Reactive crafter (P3)	-0.57	0.22	A<D, p<0.001
Study 2			
Proactive crafter (P1)	0.76	0.33	A>D, p<0.001
Reactive crafter (P3)	-0.92	-0.26	A<D, p<0.001

Note: Approach crafting was computed by means of increasing structural resources, increasing social resources, increasing challenging demands. A=approach crafting, D=Decreasing hindering job demands

Table S4
Posterior Classification Probabilities for the Most Likely Latent Profile Membership (Row) by Latent Profile (Column)

	Proactive crafter (P.1)	Active crafter (P.2)	Reactive crafter (P.3)	Percentage (%)
Study 1. Sample 1				
Proactive crafter (P.1)	0.92	0.00	0.08	31.7
Active crafter (P.2)	0.00	0.97	0.03	40.3
Reactive crafter (P.3)	0.07	0.03	0.90	28.0
Study 1. Sample 2				
Proactive crafter (P.1)	0.95	0.00	0.05	39.9
Active crafter (P.2)	0.00	0.90	0.10	48.9
Reactive crafter (P.3)	0.05	0.04	0.91	11.2

Table S5
Number and Percentage of Employees in the Three Job Crafting Profiles across Time

Time 2 Profile	Relative size	Time 3 Profile		
		Proactive crafter	Active crafter	Reactive crafter
Proactive crafter	93/32.3%	70/24.3%	22/7.6%	1/0.3%
Active crafter	134/46.5%	28/9.7%	89/30.9%	17/5.9%
Reactive crafter	61/21.2%	4/1.4%	14/4.9%	43/14.9%
Relative size		102/35.4%	125/43.4%	61/21.2%

Table S6
Means, Standard Deviations, and Correlations of Sample 1 in Study 1 (N=350)

	1	2	3	4	5	6	7	8	9
1. Increasing structural resources	(.78)								
2. Increasing social resources	.50**	(.82)							
3. Increasing challenging demands	.69**	.51**	(.79)						
4. Decreasing hindering demands	.03	.28**	.12*	(.80)					
5. Proactive personality	.46**	.21**	.47**	-.03	(.74)				
6. Job autonomy	.42**	.10	.35**	-.14**	.27**	(.88)			
7. Work engagement	.49**	.41**	.40**	-.15**	.33**	.32**	(.95)		
8. Task performance	.32**	.05	.25**	-.11*	.29**	.30**	.21**	(.85)	
9. OCB	.41**	.27**	.44**	-.06	.29**	.26**	.29**	.52**	(.75)
Mean	3.53	2.75	3.15	2.03	3.62	3.77	4.43	4.11	3.88
Standard deviation	0.63	0.80	0.79	0.66	0.49	0.82	1.15	0.45	0.46

Note: Scale reliabilities are along the diagonal, ** $p<0.01$

Table S7

Means, Standard Deviations, and Correlations of Sample 2 in Study 1 (N=296)

	1	2	3	4	5	6	7	8	9
1. Increasing structural resources	(.78)								
2. Increasing social resources	.44**	(.76)							
3. Increasing challenging demands	.65**	.49**	(.78)						
4. Decreasing hindering demands	-.06	.14*	.02	(.72)					
5. Proactive personality	.54**	.25**	.53**	-.05	(.80)				
6. Job autonomy	.38**	.07	.27**	-.05	.27**	(.85)			
7. Work engagement	.59**	.43**	.52**	-.11**	.41**	.38**	(.93)		
8. Task performance	.54**	.28**	.48**	-.15*	.36**	.27**	.50**	(.85)	
9. OCB	.45**	.38**	.45**	-.03	.39**	.29**	.49**	.62**	(.85)
Mean	3.75	3.00	3.10	2.38	3.68	3.62	4.83	4.08	3.95
Standard deviation	0.61	0.75	0.78	0.61	0.55	0.80	0.96	0.57	0.54

Note: Scale reliabilities are along the diagonal, ** $p<0.01$

Table S8

Means, Standard Deviations, and Correlations of Study 2 (N=288)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Increasing structural resources (T2)	(.78)											
2. Increasing social resources (T2)	.51**	(.82)										
3. Increasing challenging demands (T2)	.67**	.56**	(.81)									
4. Decreasing hindering demands (T2)	.11	.33**	.14**	(.80)								
5. Increasing structural resources (T3)	.70**	.44**	.51**	.07	(.81)							
6. Increasing social resources (T3)	.37**	.72**	.36**	.26**	.47**	(.83)						
7. Increasing challenging demands (T3)	.52**	.47**	.70**	.20**	.65**	.56**	(.80)					
8. Decreasing hindering demands (T3)	.08	.26**	.08	.67**	.19**	.43**	.28**	(.86)				
9. Job autonomy (T1)	.43**	.23**	.30**	-.15**	.51**	.18**	.31**	-.11	(.84)			
10. Work engagement (T3)	.49**	.27**	.39**	-.05	.61**	.24**	.44**	.01	.54**	(.96)		
11. Task performance (T3)	.27**	.08	.23**	-.25**	.38**	.03	.24**	-.27**	.27**	.34**	(.84)	
12. OCB (T3)	.32**	.18**	.27**	-.05	.33**	.17**	.27**	-.09	.27**	.29**	.40**	(.84)
Mean	3.20	2.05	2.56	1.76	3.16	2.17	2.57	1.80	4.06	4.40	4.19	3.97
Standard deviation	0.73	0.69	0.82	0.23	0.77	0.75	0.81	0.69	0.77	1.20	0.49	0.49

Note: Scale reliabilities are along the diagonal, ** $p<0.01$

Chapter 5: General Discussion: Bring the Pieces Together

The overarching aim of this thesis is to provide a theoretical clarification of job crafting construct and a better understanding of demands crafting. In this concluding chapter, I summarize the findings of each article and discuss how these articles contribute collectively to job crafting literature. Next, I acknowledge the main limitations of this thesis and a series of potential promising research directions in the future. Finally, I discuss the practical implications of this thesis to provide strategies to manage employees' job crafting behaviours.

Summary of Findings

Article 1(chapter 2) presented a comprehensive review and synthesis of job crafting literature (Zhang & Parker, 2019). This review identified common factors underlying two distinct job crafting theoretical perspectives and integrated them into a new three-level hierarchical structure. Additionally, this review recognized that the approach-avoidance orientation of job crafting is the most important distinction to distinguish job crafting types. The review of empirical studies supported this statement by showing that approach crafting was positively related to desirable outcomes, while avoidance crafting was negatively related to these desirable outcomes. The target of job crafting, crafting tasks and relations in one perspective or crafting job resources and job demands in the other perspective, is the difference emphasized by the current two job crafting theories, but it turns out to be not as important as emphasized. The review of empirical studies showed that job crafting types in two different perspectives have similar antecedents and outcomes within the approach or avoidance framework. For example, increasing structural resources (Tims, Bakker, & Derks, 2012) and task crafting (Wrzesniewski & Dutton, 2001), both approach crafting, are

positively related to desirable outcomes. Based on the review and synthesis, a series of theoretical and methodological recommendations for future directions were outlined.

Article 2 (chapter 3) builds on the recommendation identified in article 1 by investigating antecedents and mechanisms of two different types of demands crafting: reducing demands and optimizing demands. Applying the transactional theory of stress (Lazarus & Folkman, 1984), I conducted one field study and two scenario-based experimental studies to investigate how individuals' primary appraisal of challenge or hindrance affected their choices of demands crafting. Results showed different mechanisms for reducing demands and optimizing demands. Specifically, individuals' hindrance primary appraisal led to more reducing demands, which is consistent with prior research based on the transactional theory of stress (Lazarus & Folkman, 1984). Individuals' challenge primary appraisal did not affect optimizing demands directly which is inconsistent with prior research showing a positive relationship between challenge primary appraisal and approach coping. However, challenge appraisal is positively related to an increased feeling of control (secondary appraisal), which in turn led to greater use of optimizing demands. I introduced approach-avoidance theory (Elliot, 2006) and proactive motivation theory (Parker, Bindl, & Strauss, 2010) to explain the different mechanisms for optimizing demands and reducing demands. Finally, results showed that job autonomy increased the control appraisal but did not interact with primary appraisal to affect the control appraisal. This finding suggests that job autonomy is essential to promote optimizing demands when job demands are appraised as challenges but did not affect reducing demands when job demands are appraised as hindrances.

In the third article (chapter 4), I focused on the consequences of decreasing hindering job demands, one type of demands crafting strategy. This article reconciled the inconsistent findings and theoretical debates on decreasing hindering job demands. Based on the theoretical reasoning in article 1 that the effects of decreasing hindering job demands depend on the extent a person engages in approach crafting, I conducted two studies to investigate different job crafting profiles and their relationship with outcomes. Results from two studies consistently identified three different types of job crafter. All crafters engaged in decreasing hindering job demands to some level, but the main difference was the level they engaged in approach forms of crafting. Specifically, proactive crafters had the highest level of approach crafting and used approach crafting more frequently than decreasing hindering job demands. Reactive crafters had the lowest level of approach crafting and used decreasing hindering job demands more frequently than approach crafting. A middle type of crafters between proactive crafters and reactive crafters is active crafters, who used both approach crafting and decreasing hindering job demands at a moderate level. Results on differences in outcomes of job crafting profiles showed that proactive crafters had the most desirable levels of outcomes, while reactive crafters had the worst levels of outcomes. The findings suggest that when used together with approach crafting, decreasing hindering job demands is not dysfunctional, whereas when used solely without approach crafting, decreasing hindering job demands will lead to negative effects.

Overall Theoretical Contributions

Going beyond the theoretical implications discussed in each article, this thesis as a whole contributes to job crafting literature in several important ways.

First, this thesis provides a comprehensive structure of job crafting, which is a guide to map various job crafting types that have been investigated or not investigated in job crafting literature. This structure can be used as a criterion to synthesize studies that investigated various types of job crafting using multiple methods or measures. For example, due to a lack of this overarching structure, the meta-analysis by Rudolph et al. (2017) only included studies using measures based on the job demands-resources theory. Conversely, Lazazzara, Tims, and De Gennaro (2019) applied this structure and used the approach-avoidance distinction in their meta-synthesis to review and synthesize different types of job crafting behaviours investigated in qualitative studies.

The best suitable job crafting strategies may vary across populations and work situations. Thus, there have been tons of types of job crafting in qualitative studies, which are greater than in quantitative studies. To achieve a comprehensive understanding of job crafting, it is necessary to explore various types of job crafting according to the settings in empirical studies. However, without a clear structure of job crafting construct, these various job crafting types could not be integrated, which will limit the contributions of those studies to job crafting literature. With the hierarchical structure proposed in this thesis, all these job crafting types can be well organized and classified, which enables the synthesis and generalization of overall research findings.

The hierarchical structure of job crafting construct is also vital to future research. On one hand, scholars can freely investigate any new type of job crafting to build the enrichment of job crafting literature. On the other hand, new studies can be easily incorporated with prior studies to move job crafting research forward. Additionally, using this comprehensive job

crafting structure, it is easy to identify what has been thoroughly investigated and what lacks investigation in existing job crafting literature, which provides fruitful future research directions to scholars.

Second, this thesis highlights the importance to distinguish approach crafting from avoidance crafting. In article 1 (Zhang & Parker, 2019), I indicated that the distinction of approach-oriented and avoidance-oriented is the fundamental differences of various types of job crafting. Research on approach crafting has great consistence on its antecedents and outcomes across different studies. However, avoidance crafting is more complex which has been reflected in article 2 and article 3. For example, there are different antecedents and mechanisms of approach crafting (i.e., optimizing demands) and avoidance crafting (i.e., reducing demands). This means that different theory development is required for those two different types of job crafting, which I elaborate next.

Third, this thesis contributes to the extension of job crafting theory by integrating other theories such as approach-avoidance theory (Elliot, 2006), the transactional theory of stress (Lazarus & Folkman, 1984), and proactive motivation theory (Parker et al., 2010). The approach-avoidance orientation has been regarded as the most critical distinction of job crafting behaviours, which has been supported in article 1 (Zhang & Parker, 2019) and acknowledged by other scholars (e.g., Bruning & Campion, 2018; Lazazzara et al. 2019). Thus, the antecedents and consequences of job crafting can be explained from the perspective of approach-avoidance theory (Elliot, 2006), which extends existing job crafting theory mainly based on job demands-resources theory (Demerouti et al., 2001). As shown in article 2, the transactional theory of stress (Lazarus & Folkman, 1984) and proactive motivation

theory (Parker et al., 2010) can explain the antecedents and processes of demands crafting, which is insufficient for job crafting theory or job demands-resources theory to explain.

Finally, this thesis contributes to understanding how different types of crafting interact with each other from different perspectives. Article 1 (Zhang & Parker, 2019) has proposed that approach/avoidance crafting and behavioural/cognitive crafting are composite components rather than reflective components of job crafting construct. Thus, they are distinctive job crafting behaviours and may have different patterns and interactions within a person or between individuals. In article 3, the results showed that individuals may or may not use approach crafting and avoidance crafting simultaneously. They may also engage in different level of approach crafting and avoidance crafting. It is important to view and evaluate individuals' job crafting behaviours as a whole rather than different parts, as the different combination use of approach crafting and avoidance crafting leads to different outcomes.

Moreover, this thesis contributes to a better understanding of relationship between behavioural crafting and cognitive crafting, a type of crafting which has been neglected in prior research. In the second article, I investigated how individuals' cognitive appraisals affected their demands crafting. In the experimental studies, I manipulated participants' challenge or hindrance appraisal toward a job demand. This process can be regarded as one type of cognitive crafting as it involves alteration of perception to job aspects (Berg, Dutton, & Wrzesniewski, 2013; Wrzesniewski & Dutton, 2001). Although the change of perceptions of participants in the experiments was guided, this reframing process of job demands can be used as a self-initiated cognitive crafting strategy. The findings in article 2 suggest the

potential interrelation of cognitive crafting and behavioural crafting with cognitive crafting predicting behavioural types of crafting. It is worth to note that the approach or avoidance orientation of this reframing is important, as has been stated in the first article (Zhang & Parker, 2019). It is expected that the approach-oriented reframing (i.e., challenge appraisal) will lead to more positive outcomes.

Limitations

Besides specific limitations discussed in each article, I discuss the broader issues and limitations of this thesis as a whole.

First, regarding the antecedents of demands crafting, the transactional theory of stress (Lazarus & Folkman, 1984) is only one perspective to explain the processes from job demands to demands crafting. The transactional theory of stress approach considers individuals' evaluation of the effects of job demands on their well-being or self-interests. More research is needed to explore the antecedents and processes of demands crafting from other perspectives.

Second, more investigations into mechanisms and boundary conditions that explain the antecedents and consequences of demands crafting are needed. In article 2, the theoretical reasoning between individuals' primary appraisal of challenge or hindrance and demands crafting was argued with the process of positive or negative affect. In Article 3, I argued that the motivation to reduce job demands is different for different job crafters, with proactive crafters aiming for an approach-oriented goal while reactive crafters aiming for an avoidance-oriented goal. However, these mechanisms were not measured in both articles.

Third, this thesis did not investigate the consequences of optimizing demands. It was

included in a study in article 3, but that study focused on job crafting profiles. To the best of my knowledge, there has been only one study that reported a positive relationship between optimizing demands and work engagement (Demerouti & Peeters, 2018). More research is needed to test whether the positive effects of optimizing demands can hold across studies.

Fourth, this thesis mainly focused on job crafting behaviours at the individual level. Research has indicated that team members can together decide how to modify their jobs to attain their shared work goals (Leana, Appelbaum, & Shevchuk, 2009), which refers to team collaborative crafting. Only a minimal number of studies have investigated team crafting, which is also a limitation in the broad job crafting literature.

Finally, there are some methodological limitations in this thesis. Both article 2 and article 3 included cross-sectional studies that constrain causal conclusions. However, in article 2, this issue has been addressed by two experimental studies. In article 3, the aim is to preliminarily explore job crafting profiles rather than to demonstrate causality. Another limitation is that all variables in this thesis were rated by employees, a single source, which raises the problem of common method variance bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This issue was addressed by a time-lagged study in article 3, in which job crafting and dependent variables were collected at different times.

Recommendations for Future Research

Having acknowledged the limitations of this thesis, I discuss how to address these limitations in future research. I also outline several valuable recommendations for future research to address the limitations in the broader job crafting literature.

First, to address the first limitation of this thesis, future research could investigate the

antecedents of demands crafting from other perspectives. For example, another approach in stress research is from the justice theory perspective, which means whether a job demand is incongruent with organisational norms and legitimate to be expected from employees (Ford & Jin, 2015; Semmer et al., 2015). When a job demand is considered to be illegitimate for employees, it led to increased strain, feelings of resentment towards one's organization and irritability, and worse well-being (Semmer et al., 2015). Besides the direct effect, the perception of illegitimacy also moderates the relationship between job demands and outcomes. Ford and Jin (2015) found that the relationship between workload and depressive symptoms was stronger when workload levels exceeded the organisational norm of time pressure. It is expected that employees' perception of illegitimacy of job demands will affect their choices of demands crafting strategies.

Second, more research is needed to better articulate the mechanisms and boundary conditions of demands crafting. Job crafting strategies are at the action level, which serves individuals' overall goals to craft. It is crucial to take individuals' motives and goals into account when investigating their demands crafting. For example, as discussed in the second limitation, one crafting strategy could serve either an approach goal or an avoidance goal, which in turn leads to different outcomes. Future research could investigate how the motives to craft affect individuals' demands crafting and the consequences of demands crafting.

The motives to craft are also important to other types of crafting beyond demands crafting. Berg et al. (2013) have raised a call to investigate employees' motives, strengths, and passions when studying their job crafting behaviours. To respond to this call, scholars (Kooij, Woerkom, Wilkenloh, Dorenbosch, & Denissen, 2017) have investigated two new

types of crafting with different motives: job crafting towards strengths and job crafting towards interests, defined as employee self-initiated changes in the job to better use their strengths or interests, respectively. In their intervention study targeted to promote employees' job crafting behaviours, the authors (Kooij et al., 2017) found that after the intervention, there was a positive relationship of job crafting towards strengths with both demands-abilities fit and needs-supplies fit. However, job crafting towards interests was only positively related to needs-supplies fit. Therefore, the same crafting strategies with different motives may lead to different outcomes. Future studies could investigate the motives underlying employees' job crafting and how their motives affect their choices of job crafting strategies and other outcomes.

Third, a limitation in this thesis and broad job crafting literature is the lack of investigation into the consequences of optimizing demands. Therefore, another direction for future research is to investigate various outcomes of optimizing demands. To incorporate with the above recommendations, scholars could also investigate motives and goals underlying optimizing demands and how different motives affect the consequences of optimizing demands. Another direction is to investigate how individuals use optimizing demands and reducing demands in combination. As individuals may use these two different demands crafting strategies in different combinations, it will be insightful to investigate the consequences of optimizing demands from both the variable-centred approach and person-centred approach.

Fourth, to address the limitation of this thesis and broad job crafting literature, another research direction is to investigate how team members together engage in job crafting to

customize their job demands. Based on individual job crafting, team crafting has been defined as the process that team members work together to increase structural job resources, increase social job resources, increase challenging job demands, and decreasing hindering job demands for the team (Tims, Bakker, Derks, & van Rhenen, 2013). Although this definition does not include optimizing demands, it is expected that a team would engage in optimizing demands as well. Consistent with findings on outcomes of individual job crafting, team crafting behaviours that increase resources and challenges were positively related to team work engagement and team performance, while team crafting to decrease hindering job demands was negatively related to the two outcomes (Tims et al., 2013). As optimizing demands is regarded as an approach-oriented crafting strategy and has been shown related to positive outcomes, it is expected that optimizing demands at the team level will lead to positive outcomes.

Having established that teams can engage in both reducing demands and optimizing demands, the next research question is why and how teams make crafting decisions to reduce or optimize job demands. To date, no study has been done to investigate these demands crafting processes at the team level. There has been one study investigating factors that influence team job crafting (Mäkikangas, Bakker, & Schaufeli, 2017). In this study, the authors aggregated the four team-level job crafting dimensions into an overall score, which we firmly oppose. Thus, the results did not reveal any findings on the antecedents of team reducing demands specifically. However, as argued by the authors (Mäkikangas et al., 2017), team job crafting as a team process is affected by factors on three levels. Future studies could investigate factors on individual, team, and organisational levels that may influence how team

members work together to craft their job demands.

Another research question on team job crafting is how team job crafting and individual job crafting are interrelated with each other. In a team, team members may share the organisational norms that create a culture and climate, in which they think and behave in accordance with these norms (Schein, 1999). Team members may even pressure each other to obey the norms, so the team's behaviours as a whole influence individuals' behaviours accordingly (Barker, 1993). Consistent with this reasoning, scholars have indicated that job crafting at the team level stimulated individuals' job crafting behaviour (Tims et al., 2013). Although this study did not investigate optimizing demands, it is expected that team-level optimizing demands will be positively related to individual-level optimizing demands.

Fifth, although job crafting has been regarded as an independent behaviour of employees, it did not happen in a vacuum. Research has shown that leaders could support or constrain employees' job crafting behaviours (Bavik, Bavik, & Tang, 2017; Esteves & Lopes, 2017; Kim & Beehr, 2018; Lichtenthaler & Fischbach, 2018). According to social cognitive theory (Bandura, 2001), team members may observe, model, and imitate each other's behaviours, therefore, employees can also mutually influence each other's job crafting behaviours (Bakker, Rodríguez-Muñoz, & Sanz-Vergel, 2016; Demerouti & Peeters, 2018; Peeters, Arts, & Demerouti, 2016).

However, little research has been done on whether and how colleagues respond to one person's job crafting behaviour. Job crafting happens within the zone of acceptance, defined as the shared cognitive beliefs of employees and role senders regarding what activities and performance are acceptable (Katz & Kahn, 1966). An employee who changes the way to do a

task without apparent objection from colleagues is regarded as acceptable, which is in the zone of acceptance. The job crafting intentions and actions could generate objections from others, which signals a limitation in the zone of acceptance. Future studies could investigate when and why a job incumbent's job crafting actions are likely to be supported or objected by peers. Scholars have indicated that job crafting is more likely to be successful when it aligns the goals of organisations and teams (Wrzesniewski & Dutton, 2001). Therefore, how colleagues perceive and attribute an individual's goals and motivations of job crafting may influence their attitudes and reactions towards this individual. For example, the effort to optimize demands, which better aligns the goals of organisations and teams, is expected to be more acceptable by colleagues than actions to reduce demands. Additionally, individuals can adjust their job crafting behaviours according to the signals sent from their peers. Another direction for future research is how individuals adjust their crafting behaviour when a crafting action is objected by others.

Sixth, this thesis focused more on behavioural types of job crafting. Scholars have proposed that employees can also engage in cognitive crafting (Wrzesniewski & Dutton, 2001). Cognitive crafting is different from behavioural crafting as it does not change any "physical" aspects of the job, whereas it changes the way how employees perceive or frame their jobs (Berg et al., 2013; Wrzesniewski & Dutton, 2001). Cognitive crafting has been argued as a powerful strategy to change the meaning of work without tangible changes in the job (Berg et al., 2013; Wrzesniewski & Dutton, 2001). However, to date, research has been mainly focusing on the behavioural types of job crafting. The appraisal process of job demands as challenges or hindrances in article 2 is similar with the cognitive crafting process,

thus article 2 reveals some findings on cognitive crafting, but more research on cognitive crafting is needed. Berg et al. (2013) proposed three types of cognitive crafting: expanding perceptions, focusing perceptions, and linking perceptions, which depict how individuals cultivate meaningfulness by broadening their perceptions of the impact and purpose of the job, focusing the purpose of their jobs on specific tasks and relationships, and linking specific tasks and relations with their meaningful identities. Bruning and Campion (2018) extended the definition of cognitive crafting by proposing one type of cognitive crafting: metacognition, defined as "the autonomous task-related cognitive activity involving organization, sensemaking, and the manipulation of one's own psychological states" (p.510). Metacognition has been shown to be positively related to physical engagement (Bruning & Campion, 2018).

Besides the various types of cognitive crafting, another direction to study cognitive crafting is its relationship with behavioural crafting. From the perspective of action identification theory (Vallacher & Wegner, 1987), individuals' actions were guided by different levels of cognitive hierarchy. Actions can be identified from a low level that specifies how the action is performed to a high level that specifies why or with what effect the action is performed. By representing actions on a higher level, it is more likely individuals will seek opportunities to achieve fit with their jobs and environment and behave in accordance with their perceptions of work. For example, hospital cleaners who represent their actions in a high level (e.g. healing patients) rather than a low level (e.g. cleaning the patients' rooms) engage in more actions beyond job requirements, such as timing their work to be maximally efficient, and chatting with anxious pre-op patients (Wrzesniewski & Dutton,

2001). Thus, when individuals broaden their perception of the purpose and impact of their jobs, they are more likely to engage in approach-oriented behavioural crafting behaviours. Take the situation in article 2 for an example, in the situation employees presented with a high workload, if they see great impact of their tasks or link the tasks with their meaningful identities, they are more likely to engage in optimizing demands. Future research could investigate different types of cognitive crafting and how these crafting strategies influence their behavioural crafting and other outcomes.

Practical Implications

The present thesis offers several important practical implications. First, the present thesis highlights not all job crafting behaviours are beneficial. In general, approach crafting is a more favourable crafting strategy than avoidance crafting. From a training perspective, organisations could provide employees with knowledge of approach crafting and avoidance crafting to encourage more constructive job crafting behaviour. From a human resource management perspective, organisations could provide employees with opportunities and resources to engage in approach crafting. Based on the review of antecedents of approach crafting in article 1, characteristics of work context such as work design and leadership play important roles in shaping approach crafting. Job autonomy is one of the most important predictors of approach crafting as it enhances employees' perceived opportunity to job crafting (Rudolph et al., 2017; Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001; Zhang & Parker, 2019). Leaders who provide job autonomy to employees have been shown positively related to employee approach crafting. Therefore, to promote approach crafting, organisations and managers should allow employees to decide their own work scheduling,

methods and make decisions in their jobs.

The second practical implication of the present thesis is that it provides a comprehensive guide for organisations to manage employees' demands crafting behaviours. Regarding the two job crafting strategies to change job demands, optimizing demands is more favourable than reducing demands. The present thesis offers important insights into promoting optimizing demands and minimizing reducing demands. From a training and intervention perspective, to motivate employees to respond to job demands more constructively by optimizing demands, organisations should influence and encourage employees to appraise job demands as challenges and provide employees with enough job resources as well. To minimize reducing demands, the key is to prevent employees from perceiving job demands as hindrances. Additionally, reducing demands could be used as a crafting strategy to change job demands, but it must serve a proactive goal and be used with other approach forms of crafting.

Conclusions

This thesis contributes to the clarification of job crafting construct and provides novel investigations into demands crafting. The first article presents a new three-level hierarchical structure of job crafting construct, which provides a clarification and integration of job crafting constructs. This new structure is insightful as it enables the synthesis of both prior and new studies that investigated various types of job crafting. The review of job crafting literature highlights great achievements in understanding approach crafting but a lack of investigation into demands crafting either approach oriented (i.e., optimizing demands) or avoidance oriented (i.e., decreasing hindering job demands or reducing demands). To address

this important gap in job crafting literature, article 2 and article 3 contribute to a better understanding of the antecedents and consequences of demands crafting. As the approach-oriented demands crafting is a more favourable strategy than the avoidance-oriented demands crafting, article 2 contributes to job crafting literature by revealing the antecedents and mechanisms of these two demands crafting strategies. Based on the rigorous experiment results, when individuals perceived a job demand as a challenge, it enhanced their feeling of control, which in turn led to greater use of optimizing demands. However, when individuals perceived a job demand as a hindrance, it led to more reducing demands directly irrespective of the level of perceived control. Article 3 reconciles the inconsistent findings and theoretical debates on the avoidance-oriented demands crafting. This article suggests that whether decreasing hindering job demand is positive or negative depends on to what extent individuals use this strategy with other approach crafting simultaneously. Together, the present thesis raises a call for taking the types of job crafting into account when investigating employees' job crafting behaviours. Based on this research, I provide several fruitful avenues for future job crafting research.

References

Bakker, A. B., Rodríguez-Muñoz, A., & Sanz Vergel, A. I. (2016). Modelling job crafting behaviours: Implications for work engagement. *Human Relations*, *69*(1), 169-189.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1-26.

Barker, J. R. (1993). Tightening the iron cage: Concertive control in self-managing teams. *Administrative Science Quarterly, 38*, 408-437.

Bavik, A., Bavik, Y. L., & Tang, P. M. (2017). Servant leadership, employee job crafting, and citizenship Behaviours: a cross-level investigation. *Cornell Hospitality Quarterly*, *58*(4), 364-373.

Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013). Job crafting and meaningful work. In B. J. Dik, Z. S. Byrne, & M. F. Steger (Eds.), *Purpose and meaning in the workplace* (pp. 81–104). Washington, DC: American Psychological Association.

Bruning, P. F., & Campion, M. A. (2018). A role–resource approach–avoidance model of job crafting: A multimethod integration and extension of job crafting theory. *Academy of Management Journal*, *61*(2), 499-522.

Demerouti, E., & Peeters, M. C. (2018). Transmission of reduction-oriented crafting among colleagues: A diary study on the moderating role of working conditions. *Journal of Occupational and Organizational Psychology*, *91*(2), 209-234.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499-512.

Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation*

and Emotion, 30(2), 111-116.

Esteves, T., & Pereira Lopes, M. (2017). Leading to crafting: The relation between leadership perception and nurses' job crafting. *Western Journal of Nursing Research, 39*(6), 763-783.

Ford, M. T., & Jin, J. (2015). Incongruence between workload and occupational norms for time pressure predicts depressive symptoms. *European Journal of Work and Organizational Psychology, 24*(1), 88-100.

Katz, D., & Kahn, R. L. (1966). *The social psychology of organizations*. New York: Wiley.

Kim, M., & Beehr, T. A. (2018). Can empowering leaders affect subordinates' well-being and careers because they encourage subordinates' job crafting Behaviours?. *Journal of Leadership & Organizational Studies, 25*(2), 184-196.

Kooij, D. T., van Woerkom, M., Wilkenloh, J., Dorenbosch, L., & Denissen, J. J. (2017). Job crafting towards strengths and interests: The effects of a job crafting intervention on person–job fit and the role of age. *Journal of Applied Psychology, 102*(6), 971-981.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, Springer publishing company.

Lazazzara, A., Tims, M., & De Gennaro, D. (2019). The process of reinventing a job: A meta–synthesis of qualitative job crafting research. *Journal of Vocational Behaviour*. In press.

Leana, C., Appelbaum, E., & Shevchuk, I. (2009). Work process and quality of care in early childhood education: The role of job crafting. *Academy of Management Journal, 52*(6), 1169-1192.

Lichtenthaler, P. W., & Fischbach, A. (2018). Leadership, job crafting, and employee health and performance. *Leadership & Organization Development Journal*, *39*(5), 620-632.

Lichtenthaler, P. W., & Fischbach, A. (2019). A meta-analysis on promotion-and prevention-focused job crafting. *European Journal of Work and Organizational Psychology*, *28*(1), 30-50.

Mäkikangas, A., Bakker, A. B., & Schaufeli, W. B. (2017). Antecedents of daily team job crafting. *European Journal of Work and Organizational Psychology*, *26*(3), 421-433.

Parker, S. K., Bindl, U. K., & Strauss, K. (2010). Making things happen: A model of proactive motivation. *Journal of Management*, *36*(4), 827-856.

Peeters, M. C., Arts, R., & Demerouti, E. (2016). The crossover of job crafting between coworkers and its relationship with adaptivity. *European Journal of Work and Organizational Psychology*, *25*(6), 819-832.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in Behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879-903.

Rudolph, C. W., Katz, I. M., Lavigne, K. N., & Zacher, H. (2017). Job crafting: A meta-analysis of relationships with individual differences, job characteristics, and work outcomes. *Journal of Vocational Behaviour*, *102*, 112-138.

Schein, E. (1990). Organizational culture. *American Psychologist, 45*, 109–119.

Semmer, N. K., Jacobshagen, N., Meier, L. L., Elfering, A., Beehr, T. A., Kälin, W., & Tschan, F. (2015). Illegitimate tasks as a source of work stress. *Work & Stress*, *29*(1), 32-56.

Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology*, *36*(2), 1-9.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behaviour*, *80*(1), 173-186.

Tims, M., Bakker, A. B., Derks, D., & Van Rhenen, W. (2013). Job crafting at the team and individual level: Implications for work engagement and performance. *Group & Organization Management*, *38*(4), 427-454.

Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human Behaviour. *Psychological Review*, *94*(1), 3-15.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*(2), 179-201.

Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behaviour*, *40*(2), 126-146.