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Federici, E.; Boon, C.; den Hartog, D.N.

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# The moderating role of HR practices on the career adaptability–job crafting relationship: a study among employee–manager dyads

Eloisa Federici, Corine Boon, and Deanne N. Den Hartog

Amsterdam Business School, University of Amsterdam, Amsterdam, The Netherlands

## ABSTRACT

This study aims to investigate whether career adaptability could enhance an employee's work engagement through job crafting behaviors and to address the role of HR practices in this relationship. Based on career construction theory, we first examine whether career adaptability, as a self-regulatory competency may trigger enhanced job crafting behaviors, which in turn increase employee's work engagement. Second, we propose a moderation model in which different implemented high-performance work practices (HPWPs) moderate the relationship between career adaptability and job crafting. The results show that job crafting mediated the positive relationship between career adaptability and work engagement. The results support the hypothesized moderation only for opportunity-enhancing HPWPs. The relationship between career adaptability and job crafting is positive and significant for medium and high opportunity-enhancing HPWPs, but not for low levels of this HPWPs domain. The results imply that through the implementation of opportunity-enhancing HPWPs organizations can create a room for employees to express their adaptability at work through crafting their jobs, which in turn relates to work engagement.

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## KEYWORDS

Career adaptability; career construction theory; high-performance work practices; job crafting; work engagement

## Introduction

Because of increasing economic, social and technological change in the current labor market (Storey, 2000), workers need to be adaptive to adequately deal with the complexity and flexibility of their jobs and careers (e.g. Hall, 2002). Career adaptability is a key competence that helps workers face the uncertainty and the unpredictability of the novel tasks, demands and constraints (Hartung, Porfeli, & Vondracek, 2008;

**CONTACT** Eloisa Federici  [e.federici@uva.nl](mailto:e.federici@uva.nl)  Amsterdam Business School, University of Amsterdam, Plantage Muidergracht 12, 1018 TV Amsterdam, The Netherlands

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Rossier, 2015) associated with career exploration, career choice, and work adjustment (Hartung & Cadaret, 2017). Career adaptability is essentially the self-regulatory ability to engage in adaptive strategies while preparing for and participating in the work role (Savickas, 1997). Research shows that engaging in adapting behaviors results in positive career-related outcomes, such as career success (Xie, Xia, Xin, & Zhou, 2016) and employability (Coetzee, Ferreira, & Potgieter, 2015), supporting the relevance of career adaptability in the context of careers.

A few studies also found a relationship between career adaptability and broader positive job-related outcomes, such as better self-rated task performance (Ohme & Zacher, 2015), and job satisfaction (Maggiori, Johnston, Krings, Massoudi, & Rossier, 2013). Among different work-related adaptation results, work engagement has been shown to be meaningfully related to career adaptability (Rudolph, Lavigne, Katz, & Zacher, 2017). Work engagement, and the positive state of mind it entails is related with one's self-regulatory adaptability strategies, and can, therefore, be viewed as an indicator of successful adaptation to change within the Career Construction Theory model of adaptation (CCT; Savickas, 2002, 2005). However, more work is needed in explaining the relationship between career adaptability and work engagement. Recent research called for integration between the contemporary job and career design literatures. Arguing that for too long, jobs and careers have been treated as unconnected research domains, Hall and Las Heras (2010) urge scholars to recognize and investigate how important topics in these fields are interrelated (see also Akkermans & Tims, 2017; Plomp, Tims, Akkermans, Khapova, Jansen & Bakker, 2016). Building on this, the first purpose of our study is to investigate how and why career adaptability is positively related to work engagement, and therefore valuable in the context of one's job. We, therefore, identify the job-related adapting responses workers enact to increase their work engagement.

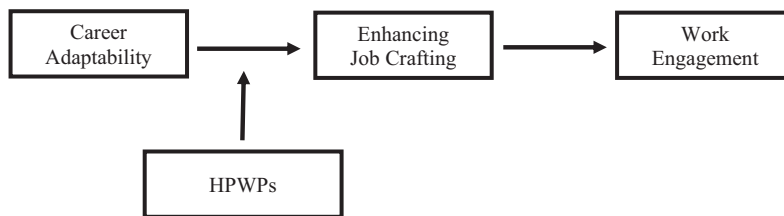
We propose that job crafting forms a mechanism that can explain the relationship between career adaptability and work engagement. Job crafting is a bottom-up job redesign process through which employees modify different parts of their jobs. It is a proactive behavior aimed at increasing person-environment fit (Parker, Bindl, & Strauss, 2010) by changing different job characteristics (Demerouti & Bakker, 2014). Previous studies have shown that job crafting is related to positive individual and organizational outcomes, such as work engagement and job performance (Bakker, Tims, & Derks, 2012), job satisfaction (Tims, Bakker, & Derks, 2013), person-job fit (Chen, Yen, & Tsai, 2014) and work meaning (Wrzesniewski, LoBuglio, Dutton, & Berg, 2013).

Job crafting forms a proactive process associated with adaptive actions used to overcome challenges at work (Berg, Wrzesniewski, & Dutton,

2010). According to the CCT, workers with increased adaptability resources will develop beliefs and behaviors (i.e. adapting responses) that address changing conditions and lead to a positive integration and fit with their work (i.e. adaptation results). Crafting one's job can, therefore, be conceptualized as an adapting response of workers, and explain why and how career adaptability is related to positive work outcomes. More specifically, given the established relationship between job crafting and work engagement, we extend this line of thinking and test whether job crafting explains the relationship between career adaptability and work engagement.

The second purpose of this study is to investigate the contextual conditions that can help workers express their career adaptability in their jobs. As workers do not live in a vacuum, it is important to understand organizational factors that might create room for workers to express their adaptability on the job and become more engaged at work. More specifically, we explore contextual variables that might set conditions under which career adaptability is related to work engagement through job crafting. We propose that high-performance work practices (HPWPs) can be important contextual resources, which can facilitate the expression of career adaptability in one's job by giving the workers the opportunity to adapt through crafting their job. By applying CCT to the context of one's job, we complement it with the principles stemming from the Conservation of Resources (COR) theory (Hobfoll, 1989) to understand how individual and contextual resources interact in affecting job crafting behaviors and work engagement, thus suggesting that both individual and contextual resources can increase positive job-related outcomes in general, and work engagement in particular (Boon & Kalshoven, 2014; Salanova, Agut, & Peiro, 2005). We propose that HPWPs form contextual resources that help workers to capitalize on their individual resources. More specifically, HPWPs can play a role in the extent to which individuals are involved in job crafting activities (Cleveland, Byrne, & Cavanagh, 2015). As Berg et al. (2010, p. 159) noted, workers craft in the context of their jobs, which are marked by prescribed tasks, expectations, and positions in the organizational hierarchy; thus, any such features may constrain employees' opportunities to proactively change their jobs. Hence, HPWPs that aim to influence the abilities, motivations and opportunities of employees (e.g. Lepak, Liao, Chung, & Harden, 2006), may play a role in shaping the workers' adapting behaviors. If people have high career adaptability resources and are offered HPWPs, they will be more likely to proactively craft different aspects of their jobs.

Overall, the aim of this study is to examine how and under what circumstances career adaptability relates to work engagement. First, with



**Figure 1.** Research model.

the purpose of explaining *how* career adaptability relates to engagement, we investigate the mediating role of job crafting as a job-related proactive behavior associated with high career adaptability, building on CCT. Second, we integrate CCT and COR theories and explore the role of HPWPs in setting favorable conditions for the employees to capitalize on their resources. The proposed moderated mediation model (Figure 1) is tested among 112 employees–supervisors dyads working in a variety of organizations in the Netherlands.

The structure of this paper is as follows. First, we discuss the theoretical grounding of (1) the relationship between career adaptability and work engagement; (2) job crafting as a mediating mechanism of the relationship between career adaptability and work engagement; (3) HPWPs as moderators in the relationship between career adaptability and job crafting. Second, we describe the study design and present the related results. Third, we discuss the theoretical and practical implications of this study.

## Background and hypotheses

### *The relevance of career adaptability in the work context*

According to career construction theory (CCT; Savickas, 2002, 2005), career development is driven by a process of adaptation to the social environment, aimed at reaching person–environment integration. CCT takes a contextual perspective on such adaptation and views career construction as a series of attempts to implement a self-concept in work roles (Savickas & Porfeli, 2012). This adaptation process is aimed at reaching social integration by dealing with the social expectations connected with entering one job, participating in the work role, and transitioning between different jobs. More specifically, the career construction model of adaptation distinguishes between adaptivity, adaptability, adapting responses, and adaptation results.

Adaptivity refers to a stable psychological trait of readiness and willingness to adapt to career changes (Hirschi, Herrmann, & Keller, 2015; Rudolph, Lavigne, & Zacher, 2017; Savickas & Porfeli, 2012). Previous research operationalized adaptivity by considering, among others, both

cognitive abilities and personality traits (Rudolph et al., 2017), such as learning goal orientation, proactive personality, career optimism (Tolentino, Sedoglavich, Lu, Garcia, & Restubog, 2014), and core self-evaluations (Hirschi & Valero, 2015). Adaptability instead refers to more transactional and changeable competencies and resources (Rudolph et al., 2017) that denote the ability to adapt to changes. Adapting responses refer to performing adaptive behaviors that address changing conditions, such as career planning (Hirschi et al., 2015), career exploration (Li et al., 2015) and career beliefs (Hirschi et al., 2015). Finally, adaptation results are the outcomes of adapting behaviors, including career decidedness, career commitment, job satisfaction and work success. Overall, CCT draws a sequential path that represents adaptation, where one's adaptivity positively affects career adaptability, and in turn adapting responses and adaptation results (Savickas, 2005; Savickas & Porfeli, 2012). In this study we focus on the relationship between career adaptability and job crafting, which can be seen as an adapting response in the context of one's job.

Career adaptability refers to the resources individuals need to successfully manage current and anticipated tasks associated with their careers, occupational transitions and complex problems related to one's career and work. Career adaptability constitutes a self-regulatory, malleable competency (Rudolph et al., 2017), which enables individuals to build their careers by broadening and redefining their self-concepts in occupational roles (Koen, Klehe, & van Vianen, 2012). Career adaptability is a multi-dimensional construct generally measured in terms of four adaptability resources: concern, control, curiosity, and confidence. Concern about the future helps individuals to look ahead and prepare for future career tasks. Control over one's career enables individuals to be responsible in making career-related decisions. Curiosity prompts individuals to explore different opportunities and to think about themselves in various situations and roles. Confidence in one's ability to overcome obstacles and actualize choices in pursuing career aspirations enables individuals to engage in active problem solving. Although there is theoretical and empirical evidence for the distinctiveness of these four dimensions, they are also generally found to be highly correlated (e.g. Hirschi et al., 2015).

Based on CCT, individuals who are willing (adaptivity) and able (adaptability) to perform behaviors that address changing conditions (adapting) are expected to reach higher levels of adaptation results. The adaptation result represents a goodness of fit between the person and the environment that is indicated by development, satisfaction, success in one's job, career, and life. Thus, the career construction model of adaptation takes into account the spillover effects between one's career, job, and life in general by operationalizing and identifying adaptation results

in terms of several positive outcomes concerning individual's career and jobs to various extents. On the one hand, previous research showed evidence of the relation between career adaptability and career-related adaptation results, such as career success (Xie et al., 2016), calling (Guo et al., 2014), career satisfaction (Chan & Mai, 2015) and entrepreneurial intentions and mindsets (e.g. Tolentino et al., 2014). On the other hand, there is some evidence concerning the relation between career adaptability and work-related adaptation results, such as job satisfaction (Zacher & Griffin, 2015), commitment (Ito & Brotheridge, 2005), job stress (e.g. Maggiori et al., 2013) and performance (Ohme & Zacher, 2015). However, there is a paucity of research concerning the work-related adapting responses that can explain how career adaptability translates into such positive adaptation results in the context of one's job.

Rossier, Zecca, Stauffer, Maggiori, & Dauwalder (2012) found evidence for the relation between career adaptability and work engagement. Work engagement refers to a sense of energetic and affective connection with one's work and is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Engaged workers see themselves as capable of dealing effectively with the demands of their jobs, and they have high levels of mental resilience, concentration, and involvement in their work. Work engagement is a function of the job demands, resources, and personal control one has over one's job (Schaufeli & Bakker, 2004). Previous research proposed work engagement as an indicator of successful adaptation to change (Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012; Van den Heuvel, Demerouti, Bakker, & Schaufeli, 2010), in that when workers view change as a positive challenge and they deal with it successfully, this likely has a positive impact on work engagement (Avey, Wernsing, & Luthans, 2008). As such, work engagement has shown to be related to high levels of career adaptabilities resources (Rossier et al., 2012).

Besides having positive effects on vocational paths, career adaptability can also contribute to individuals' adjustment to work-related contextual constraints. For example, Rossier et al. (2012) found evidence for the mediating role of career adaptability in the relationship between personality traits and work engagement. However, to our knowledge, researchers have not yet studied the job-related mechanisms through which adaptable workers are more engaged and involved in their own jobs, and here we focus on job crafting.

### ***The mediating role of job crafting***

Building on CCT, we propose that job crafting acts as a mediator in the relationship between career adaptability and work engagement. More



specifically, we conceptualize job crafting as an adaptive response in the career construction model of adaptation. Adapting responses are behaviors and beliefs that individuals use to deal with changing work and career conditions (Savickas & Porfeli, 2012). They are aimed at coping with occupational transitions and at adjusting to work contingencies. Generally speaking, they belong to five categories of behaviors: orientation, exploration, establishment, management and disengagement (Savickas & Porfeli, 2012). Although empirical research on different operationalizations of adapting responses is limited, previous research has mainly considered career-related behaviors as examples of adapting responses (Rudolph et al., 2017). For example, career planning (Taber & Blankemeyer, 2015), career exploration (Li et al., 2015), occupational self-efficacy (Hirschi et al., 2015) and career decision-making self-efficacy (Guan et al., 2016) have shown to be related to career adaptability. However, there is less research on adapting responses in terms of job-related behaviors. Here we focus on job crafting as a work-related adapting response that may explain the relationship between career adaptability and work engagement.

Job crafting was introduced by Wrzesniewski and Dutton (2001) to describe a bottom-up job redesign process, through which employees proactively apply changes to several aspects of their jobs. Employees voluntarily activate these behaviors by altering the meaning of their jobs with the aim of reaching a better job fit. The central characteristic of this process is that it is initiated by employees themselves (Tims, Bakker, & Derks, 2012), as opposed to top-down redesign interventions initiated by the organization. In line with this, here we focus on job crafting behaviors aimed at changing the task, relational and cognitive boundaries of one's job, and based on Bindl, Unsworth, and Gibson (2014) we add skill crafting, which refers to proactively acquiring and mastering new skills at work. Furthermore, Bindl et al. (2014) also distinguish between enhancing and limiting job crafting behaviors in these domains, which is consistent with Tims et al., (2012) differentiation between seeking resources and challenges, and reducing demands. Thus, by combining widely used approaches to job crafting of Wrzesniewski and Dutton (2001) and Tims et al., (2012), Bindl et al. (2014) distinguish not only the target of the changes the job crafter applies to his/her job (i.e. task, relational, cognitive, skill), but also whether the job crafting is expansion-oriented (i.e. enhancing job crafting) or contraction-oriented (i.e. limiting job crafting). Here, we adopt the perspective of Bindl et al. (2014), by making the same conceptual distinctions between different types of job crafting behaviors, and by using the related measurement instrument.

Previous research has highlighted several individual antecedents of job crafting. For example, individuals higher on proactive personality were

more likely to job craft (Bakker et al., 2012), as were employees' high on regulatory promotion focus (Petrou, 2013). Here, based on CCT we propose that high levels of career adaptability are likely to prompt more job crafting. Given that workers craft their jobs to adapt to changing environmental circumstances and to optimize the fit between their needs and environmental constraints, we expect job crafting behaviors to be an expression of career adaptability in the work context.

Examining job crafting through a process-oriented lens, Berg et al. (2010) argued that job crafting is a proactive process associated with adaptive actions used to overcome challenges at work. They consider proactivity and adaptivity as interrelated processes, '(... ) in which efforts to initiate or create change (proactivity) can shape and be shaped by responses to perceived challenges to making such change (adaptivity)' (p. 159). Job crafting forms a dynamic process of continuous adjustment and change, which might require workers to adapt to challenges (Pulakos, Arad, Donovan, & Plamondon, 2000), particularly in the form of creative problem solving. We, therefore, propose that workers with high levels of career adaptability will craft their jobs more. In turn, they will be more engaged with their work because they reached a better fit with their job and higher work motivation.

In this study, we focus on enhancing job crafting behaviors as opposed to limiting job crafting behaviors. Previous research highlighted contrasting results concerning the relationship between limiting crafting and work engagement (e.g. Tims et al., 2012, 2013); limiting job crafting seems more strongly related to fatigue and exhaustion as opposed to work engagement, indicating hindrance job demands as stressful, not motivating behaviors (Crawford, LePine, & Rich, 2010). The four resources used to operationalize career adaptability (concern, control, curiosity and confidence) explicitly focus on more expansion oriented strategies, such as having curiosity in exploring possible paths and selves in one's career, thus allowing workers to broaden and redefine their self-concepts in occupational roles (Koen et al., 2012). Therefore, we focus on enhancing task, relational, cognitive and skills focused job crafting behaviors. We propose:

Hypothesis 1. Enhancing job crafting mediates the positive relationship between career adaptability and work engagement.

### ***The moderating role of high-performance work practices***

Combining the CCT framework with Conservation of Resources (COR) Theory (Hobfoll, 1989, 2001) we suggest that the proposed relationship between career adaptability, job crafting and work engagement is

stronger when HPWPs are implemented in the organization. CCT suggests that the context plays an important role in adaptation and the proactive redefinition of one's job. Career adaptabilities are conceptualized as psychosocial constructs referring to self-regulation strengths or capacities that reside at the intersection of person-in-environment (Savickas & Porfeli, 2012). They are developed through the interaction between the inner and outer world and relate strongly to specific contextual circumstances and contingencies (Tolentino et al., 2014). Furthermore, contextual elements can place boundary conditions for the individual adaptability to be expressed (Savickas & Porfeli, 2012), and achieve adaptation results. CCT, therefore, recognizes the relevance of the context in developing and expressing one's career adaptability. However, CCT does not specify how contextual elements can affect the expression of career adaptability. Here, we are interested in investigating when career adaptability relates to positive adaptation results at work. Based on COR theory, we examine the impact of the work conditions as defined by HPWPs in creating room for employees to express their adaptability in the workplace. Thus, we examine HPWPs as moderator.

Previous research in the field of strategic HRM practices has identified bundles of high-performance work practices (HPWPs) (Huselid, 1995). HPWPs are defined as 'systems of human resource practices designed to enhance employees' skills, commitment, and productivity' (Datta, Guthrie, & Wright, 2005, p. 135). HPWPs are aimed at increasing organizational performance by affecting a variety of employees' attitudes and behaviors. HPWPs are related to several organizational performance indicators (Combs, Liu, Hall, & Ketchen, 2006), through affecting more proximal outcomes such as employees' turnover intentions, absenteeism and organizational citizenship behaviors (Kehoe & Wright, 2013). Lv and Xu (2016) for example, showed evidence of the relevance of HPWPs for employees' work engagement and person-organization fit.

Research on the specific composition of high-performance work systems has not converged into a stable and final set of practices (Posthuma, Campion, Masimova, & Campion, 2013) and the composition of such systems may change on the basis of contextual factors such as the type of industry of the specific organization where they are implemented (Datta et al., 2005). Nevertheless, commonly used examples of HPWPs are incentive compensation, employee development, training, employee participation and selectivity that have been further grouped into three HR domains within the AMO (i.e. enhancing ability, motivation and opportunity) theoretical framework (e.g. Lepak et al., 2006; Jiang et al., 2012). Within this framework, HPWPs are clustered in three domains: (1) Practices aimed at increasing employees' knowledge, skills

and abilities (such as selection and training); (2) Practices aimed at improving employees' motivation and effort to perform (e.g. performance management, incentives and rewards); (3) Practices aimed at increasing employees' opportunities to perform (e.g. job design and participation).

Complementing CCT with COR theory (Hobfoll, 1989, 2001), we propose that career adaptabilities represent individual resources the workers can capitalize on in the workplace and that HPWPs can enhance the beneficial effect of possessing adaptability resources in the workplace. COR focuses on both internal and environmental elements in investigating the development and protection of resources in stress-related processes (Hobfoll, 2001). COR posits that individuals strive to obtain, retain, protect and foster resources, defined as 'objects, personal characteristics, conditions, or energies that are valued by the individual' (Hobfoll, 1989, p. 516). Psychological stress occurs when individuals' resources are threatened, lost, or missing after significant resource investment. More specifically, individuals lacking resources are likely to lose further resources (loss spiral), whereas individuals possessing resources are more capable of gaining further resources (gain spiral). Building on this, career adapt-abilities represent individual resources that – when present – can increase job crafting and engagement. People with high individual resources in the form of career adaptability are more likely to gain additional resources by engaging in proactive actions aimed at changing facets of one's job. They have the curiosity to explore possible alternatives and opportunities while evaluating their fit with their environment. Also, they are confident in their capabilities of overcoming obstacles and solving problems.

We argue that the implementation of HPWPs can create an environment in which building a resource pool to engage in proactive behaviors is facilitated. Previous studies showed that HPWPs represent environmental resources offered by the organization that workers can benefit from (Boon & Kalshoven, 2014; Wheeler, Halbesleben, & Shanine, 2013). In line with this, we argue that a lack of different domains of HPWPs constrains the manifestation of career adaptability in the workplace in terms of proactive behavior, thus inhibiting its beneficial effects. Hence, we hypothesize that in a work environment characterized by low levels of HPWPs, possessing individual resources such as career adaptability will not result in increased job crafting behaviors. The conceptualization of job crafting as an adaptive response is therefore conditioned on the presence of contextual resources in terms of HPWPs implemented by the organization. A work environment with high levels of HPWPs can create a room for employees to express their adaptability by crafting their job

and, in turn, increasing their work engagement (see also [Figure 1](#)). We expect:

Hypothesis 2: The positive relationship between career adaptability and enhancing job crafting is moderated by HPWPs, such that this relationship will be stronger under high HPWPs than under low HPWPs.

## Methods

### *Sample and procedure*

The data for this study were collected in 2016 through an online survey. We sent the online questionnaire to employees and their supervisors in the network of the researchers. The employees could share the same supervisor. After two weeks a reminder was sent to all the employees willing to participate to the study. In total 152 questionnaires were sent to employees and 94 to their supervisors working in the Netherlands. Supervisors rated HPWPs, and employees rated their career adaptability, enhancing job crafting and work engagement. The questionnaires were completed by 131 employees and 75 supervisors (i.e. 43 employees shared the same supervisor with another employee of the sample), leading to 118 matched dyads in total (response rate of 86 % for the employees, and of 80% for their supervisors). Because of missing data in one of the study variables, 6 dyads were deleted, thus leading to a final sample size of 112 matched dyads (72 supervisors) with no missing data.

The sample of employees included 56 females and 56 males (50%), with an average age of 31.84 ( $SD = 11.68$ ). The employees worked in a variety of sectors, including business/financial services (20.5%), IT (13.4%), industrial sector (10.7%), trade and catering sector (10.7%) and healthcare (9.8%). Most of the employees had intermediate vocational training HBO (33.9%) or university training (25%). Employees worked on average 27.63 hours a week ( $SD = 13.62$ ), with 48.2% of the total sample working 36 or more hours a week, and 51.8% of the participants worked up to 32 hours per week. The employees had worked in their current organization for 5.84 years ( $SD = 7.67$ ) and had worked with their current supervisor for 2.22 years ( $SD = 2.59$ ). The sample of the supervisors included 22 females (30.6%) and 50 males (69.4%), with an average age of 38.92 ( $SD = 11.69$ ). Most of the supervisors had intermediate vocational training HBO (37.5%) or university training (40.3%), and on average they had worked in their current organization for 9.02 years ( $SD = 9.18$ ).

### *Measures*

Unless otherwise stated, the constructs were measured on a 5-point scale (1= not at all; 5 = very much). The surveys were administered in Dutch.

With the exception of the career adaptability and work engagement scales, for which there were published validated Dutch versions of the scales, we used the direct translation procedure to translate all items.

*Career adaptability* was measured with the short Dutch version of the Career Adapt-Abilities Scale (Van Vianen, Klehe, Koen, & Dries, 2012) developed by Savickas and Porfeldi (2012). This 12-item scale contains four subscales with three items each to measure the adaptability resources of concern, control, curiosity and confidence. Examples of items are 'Thinking about what my future will be like' for the concern scale, 'Taking responsibility for my actions' for the control scale, 'Looking for opportunities to grow as a person' for the curiosity subscale, and for the confidence scale 'Working up to my ability'. The Cronbach's Alpha's of the subscales of concern ( $\alpha = .87$ ), control ( $\alpha = .88$ ), curiosity ( $\alpha = .77$ ) and confidence ( $\alpha = .82$ ), and of the overall scale of Career Adapt-Abilities ( $\alpha = .92$ ) were high.

*High-performance work practices* were rated by the supervisors with the 18 items scale developed Jiang, Hu, Liu, & Lepak (2015) on a 7-point Likert-type scale (1 = 'strongly disagree'; 7 = 'strongly agree'). This scale measures three HR policy domains, with 6 items each: (1) ability-enhancing HPWPs, such as selection and training (e.g. 'Selection emphasizes traits and abilities required for providing high quality of performance',  $\alpha = .72$ ); (2) motivation-enhancing HPWPs, such as performance appraisal and rewards (e.g. 'Employee salaries and rewards are determined by their performance',  $\alpha = .79$ ); and (3) opportunity-enhancing HPWPs, such as work-life balance, participation and information sharing practices (e.g. 'Employees are often asked to participate in work-related decisions',  $\alpha = .75$ ). The overall reliability of the combined scale was also good ( $\alpha = .87$ ).

*Enhancing job crafting* was measured using the Job Crafting Questionnaire developed by Bindl et al. (2014). The scale contains 14 items measuring enhancing task (e.g. 'I added complexity to my tasks by changing their structure or sequence'), relational (e.g. 'I made efforts to get to know other people at work better'), skill, (e.g. 'I sought out opportunities for extending my overall skills at work') and cognitive crafting (e.g. 'I thought about new ways of viewing my overall job'). The Cronbach's alpha showed the sufficiently high reliability of the subscales of enhancing task ( $\alpha = .80$ ), relational ( $\alpha = .71$ ), skill ( $\alpha = .85$ ) and cognitive ( $\alpha = .76$ ) crafting, as well as of the overall scale enhancing job crafting ( $\alpha = .86$ ).

*Work Engagement* was measured by means of the nine-item version of the Dutch Utrecht Work Engagement Scale (Schaufeli, Bakker, & Salanova, 2006) on a 7-point scale (1 = never; 7 = always). This scale

measures the dimensions of vigor (e.g. ‘At my work, I feel bursting with energy’,  $\alpha = .92$ ), dedication (e.g. ‘I am enthusiastic about my job’,  $\alpha = .94$ ) and absorption (e.g. ‘I get carried away when I am working’,  $\alpha = .88$ ) with three items per dimension. The Cronbach’s Alpha of this scale is  $\alpha = .97$ , thus indicating high reliability.

*Control variables.* To rule out potentially spurious relations, in all our analyses we controlled for age (in years), gender (1 = male, 2 = female), tenure with the organization (in years) and number of working hours because these are the control variables commonly included in studies on job crafting as they tend to relate to job crafting behaviors and career competencies (Akkermans & Tims, 2017; Tims et al., 2013).

*Measurement model.* We tested the measurement model separately for the variables rated by the employees and the ones rated by the supervisors. Following Little, Rhemtulla, Gibson, & Schoenmann (2013), we conducted first-order CFAs to test the fit of the measurement model of career adaptability (with concern, control, curiosity, and confidence as observed parceled indicators), enhancing job crafting (with task, relational, skill and cognitive crafting as observed parceled indicators), and work engagement (with vigor, dedication and absorption as observed parceled indicators). The fit of the model was adequate ( $\chi^2 = 54.163$ ,  $df = 41$ ,  $p = .08$ , CFI = 0.982, TLI = 0.976, SRMR = 0.045, RMSEA = 0.054). We compared the fit of this measurement model to three alternative models: (1) a two-factor model with career adaptability and enhancing job crafting as one factor, and engagement as second factor; (2) a two-factor model with career adaptability as one factor, and enhancing job crafting and engagement as second factor; (3) a one-factor model.

The proposed measurement model exhibited significantly better model fit than all three alternative models (Satorra–Bentler scaled chi-square difference test: (1) SB-corrected  $\Delta\chi^2 = 21.77$ ,  $\Delta df = 2$ ,  $p = .000$ ; (2) SB-corrected  $\Delta\chi^2 = 23.02$ ,  $\Delta df = 2$ ,  $p = .000$ ; (3) SB-corrected  $\Delta\chi^2 = 103.09$ ,  $\Delta df = 3$ ,  $p = .000$ ), thereby confirming the adequacy of the proposed measurement model. The measurement model fit of the HPWPs rated by the supervisors was not optimal. We conducted three CFAs, one for each HR domain (i.e. ability-enhancing, motivation-enhancing and opportunity-enhancing). After allowing the correlation between the residual variances of two items (i.e. item 6 with item 5)<sup>1</sup>, the measurement model of the abilities-enhancing HPWPs was adequate ( $\chi^2 = 5.596$ ,  $df = 8$ ,  $p = .69$ , CFI = 1.000, TLI = 1.055, SRMR = 0.042, RMSEA = 0.000). After allowing the correlation between the residual variances of two items of the motivation-enhancing HPWPs (i.e. item 10 and item 12)<sup>2</sup>, and excluding item 11 to improve the model fit<sup>3</sup>, also this HPWPs domain reached adequate fit ( $\chi^2 = 4.775$ ,  $df = 4$ ,  $p = .31$ , CFI = 0.992, TLI = 0.980, SRMR = 0.050,

RMSEA = 0.042). The fit of the opportunity-enhancing HPWPs was adequate ( $\chi^2 = 8.398$ ,  $df = 9$ ,  $p = .49$ , CFI = 1.000, TLI = 1.015, SRMR = 0.051, RMSEA = 0.000).

### **Analytical strategy**

To test the hypothesized model, we used a path analysis in MPlus, which allows for simultaneous estimation of different regression equations, and for testing the significance of indirect, as well as conditional effects. Given the skewed distribution of some of the study variables, we used Maximum likelihood with robust standard errors and chi-square (MLR) to estimate the parameters of the model. Because some of the participants have the same supervisor, the data were nested. Therefore, we computed standard errors and chi-square tests of model fit taking into account complex sampling features (e.g. stratification, sampling weights and clustering) by means of a sandwich estimator (i.e. Type = Complex in MPlus), which corrects the standard errors to reflect the effects of the nestedness. We report the chi-square statistic ( $\chi^2$ ), the root mean square of error of approximation (RSMEA), the comparative fit index (CFI), the Tucker–Lewis index (TLI) and the standardized root mean square residual (SRMR) for each analysis. We used Hu & Bentler (1998, 1999) fit criteria of RMSEA below .06, CFI and TLI above .95 and SRMR below .08 because chi-square significance is heavily influenced by sample size and the size of correlations between study variables (Nye & Drasgow, 2011).

### **Results**

The descriptive statistics and bivariate correlations of the study variables can be found in Table 1. Generally speaking, all correlations were in the expected direction. Of the demographics, age, employee's tenure with the organization and with the supervisor, and number of working hours were significantly related to most of the study variables. We, therefore, controlled for these variables in our analyses. In Hypothesis 1, we theorized that enhancing job crafting mediates the positive relationship between career adaptability and work engagement. Results of the path analysis are reported in Table 2. In this model we estimated all the paths linking the study variables, therefore, it is a saturated model with a perfect fit to the data. Table 2 shows that career adaptability has a positive significant relationship with enhancing job crafting ( $\beta = .43$ ,  $p < .01$ ) and work engagement ( $\beta = .21$ ,  $p < .01$ ). In addition, enhancing job crafting has a positive significant relationship with work engagement ( $\beta = .34$ ,



**Table 1.** Means, standard deviations, correlations.

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Age	31.84	11.68	(-)										
2. Gender (male = 1, female = 2)	1.50	0.50	-0.05	(-)									
3. Tenure organization	5.84	7.67	.60**	.07	(-)								
4. Tenure supervisor	2.22	2.59	.36**	.04	.37**	(-)							
5. Working hours	27.63	13.62	.35**	-.19*	.20*	.02	(-)						
6. Career adaptability	3.74	0.62	-.09	-.17	.02	-.11	.09	(0.92)					
7. Ability-enhancing HPWPsa	5.11	0.94	.14	-.17	.12	-.15	.33**	.23*	(0.72)				
8. Motivation-enhancing HPWPsa	5.17	1.02	.18	-.01	.12	-.06	.43**	.00	.64**	(0.79)			
9. Opportunity-enhancing HPWPsa	4.85	0.94	.17	.07	.36**	.06	.18	.17	.46**	.45**	(0.75)		
10. Enhancing job crafting	3.20	0.55	-.04	-.01	-.10	-.02	.24*	.44**	.26**	.31**	.20*	(0.86)	
11. Work engagement	5.04	1.36	.38**	-.02	.19*	.19*	.38**	.33**	.20*	.25**	.24*	.46**	(0.97)

N = 112 dyads. Alphas are in parentheses.

<sup>a</sup>Variables rated by the supervisors.

\**p* < .05.

\*\**p* < .01.

**Table 2.** Results of path analysis testing mediation.

	Enhancing job crafting	Work engagement
Age	-0.01	0.36**
Tenure organization	-0.18	-0.07
Tenure supervisor	0.09	0.11
Working hours	0.23**	0.16*
Career adaptability	0.43**	0.21*
Enhancing job crafting		0.34**
Constant	2.82**	-0.87
R <sup>2</sup>	0.26**	0.43**

*N* = 112 dyads. Standardized coefficients are presented.

\*  $p < .05$ .

\*\*  $p < .01$ .

$p < .01$ ). The indirect effect of career adaptability on engagement through enhancing job crafting is positive and significant ( $\beta = .14$ ,  $p < .01$ ). Overall, the total effect of career adaptability on engagement is positive and significant ( $\beta = .36$ ,  $p < .01$ ). Taken together, these results provide support for Hypothesis 1.

Hypothesis 2 proposes that career adaptability translates into higher levels of enhancing job crafting more so when employees are provided with high levels of HPWPs that are aimed at enhancing their abilities, motivation, and opportunities to perform. We tested mediation and moderation simultaneously using path modelling, to prevent methodological problems that might arise from testing them separately (Edwards & Lambert, 2007; Preacher, Rucker, & Hayes, 2007). We regressed enhancing job crafting on the control variables, career adaptability, the three domains of HPWPs and the three interaction terms (between career adaptability and each domain of HPWPs). We then regressed work engagement on the control variables, career adaptability and on enhancing job crafting. We standardized career adaptability and the three domains of HPWPs before proceeding with the analyses. The results of this model can be found in Table 3. The proposed model fitted the data well ( $\chi^2 = 2.657$ ,  $df = 6$ , CFI = 1.00, TLI = 1.143, SRMR = 0.009, RMSEA = 0.000). Only the opportunity-enhancing HPWPs interact with career adaptability in influencing enhancing job crafting ( $\beta = .20$ ,  $p < .05$ ), whereas the other two domains show no significant interaction. Thus, our results partially support Hypothesis 2.

Table 4 shows the estimated effects of career adaptability on enhancing job crafting at different levels of opportunity-enhancing HPWPs: the mean, one and two standard deviations below and above the mean. In Figure 2 we plotted the interaction effect for one standard deviation below and above mean of opportunity-enhancing HPWPs. Table 4 shows a significant positive relationship between career adaptability and enhancing job crafting for medium ( $\beta = .28$ ,  $p < .01$ ), high ( $\beta = .39$ ,  $p < .01$ ) and very high ( $\beta = .49$ ,  $p < .01$ ) opportunity-enhancing HPWPs,

**Table 3.** Results of path analysis testing interactions.

	Enhancing job crafting	Work engagement
Age	-0.03	0.36**
Tenure organization	-0.21*	-0.07
Tenure supervisor	0.13	0.11
Working hours	0.11	0.16*
Career adaptability	0.50**	0.21*
Ability-enhancing HPWPs <sup>a</sup>	-0.03	
Motivation-enhancing HPWPs <sup>a</sup>	0.26*	
Opportunity-enhancing HPWPs <sup>a</sup>	0.10	
Career adaptability* Ability-enhancing HPWPs	0.02	
Career adaptability* Motivation-enhancing HPWPs	-0.11	
Career adaptability* Opportunity-enhancing HPWPs	0.21*	
Enhancing job crafting		0.34**
Constant	5.69**	0.42
R-square	0.37**	0.43**

N = 112 dyads. Standardized coefficients are presented.

<sup>a</sup>Variables rated by the supervisors.

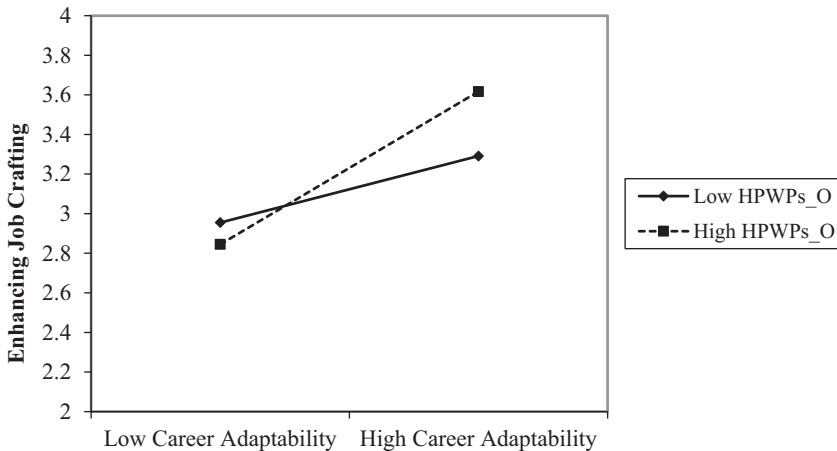
\*  $p < .05$ .  
 \*\*  $p < .01$ .

**Table 4.** Analysis of simple effects for opportunity-enhancing HPWPs domain.

Moderator value	First stage	Indirect effect
-2 SD	.06(.11)	.05(.09)
-1 SD	.17**(.06)	.14*(.06)
Mean	.28**(.05)	.23**(.07)
+1 SD	.39**(.08)	.32**(.11)
+2 SD	.49**(.12)	.41*(.16)

N = 112 dyads. Unstandardized coefficients are presented, standard errors in parentheses.

\*  $p < .05$ .  
 \*\*  $p < .01$ .



**Figure 2.** The moderating role of opportunity-enhancing HPWPs domain on the relationship between career adaptability and enhancing job crafting.

and a non-significant relationship ( $\beta = .06, p > .05$ ) for very low levels of the opportunity-enhancing HPWPs (two standard deviations below the mean). Also, the indirect effect of career adaptability on work

**Table 5.** Results of path analysis testing multiple interactions.

	Enhancing job crafting	Work engagement
Age	-0.03	0.36**
Tenure organization	-0.21*	-0.09
Tenure supervisor	0.13	0.11
Working hours	0.11	0.14
Career adaptability	0.50**	0.22**
Ability-enhancing HPWPs <sup>a</sup>	-0.03	-0.03
Motivation-enhancing HPWPs <sup>a</sup>	0.26*	0.01
Opportunity-enhancing HPWPs <sup>a</sup>	0.10	0.05
Career adaptability* Ability-enhancing HPWPs	0.02	-0.10
Career adaptability* Motivation-enhancing HPWPs	-0.11	0.16
Career adaptability* Opportunity-enhancing HPWPs	0.21*	0.02
Enhancing job crafting		0.30**
Enhancing job crafting* Ability-enhancing HPWPs		0.19
Enhancing job crafting* Motivation-enhancing HPWPs		-0.20
Enhancing job crafting* Opportunity-enhancing HPWPs		-0.14
Constant	-0.12	2.52**
R-Square	0.37**	0.47**

*N* = 112 dyads. Unstandardized coefficients are presented, standard errors in parentheses.

<sup>a</sup>Variables rated by the supervisors.

\**p* < .05.

\*\* *p* < .01.

engagement through enhancing job crafting follows the same trend, by being significant at medium, high and very high levels of the moderator, and non-significant ( $\beta = .05$ ,  $p > .05$ ) for very low levels of the moderator. As depicted in [Figure 2](#), the slope linking career adaptability and enhancing job crafting is steeper for high levels of opportunity-enhancing HPWPs. In other words, the relationship between career adaptability and enhancing job crafting is stronger when levels of opportunity-enhancing HPWPs are high rather than low.

Following suggestions of Edwards & Lambert (2007) and Preacher et al. (2007), we also tested the (not hypothesized) conditional effect of HPWPs on the direct path between career adaptability and work engagement on the second stage of the indirect effect of career adaptability on work engagement through enhancing job crafting. The results can be found in [Table 5](#). This model fits the data well ( $\chi^2 = 1.922$ ,  $df = 3$ , CFI = 1.000, TLI = 1.128, SRMR = 0.01, RMSEA = 0.000). However, [Table 5](#) shows that none of the HPWP domains act as a moderator on the second stage simple effect nor on the direct effect. Taken together, these results provide additional support for our proposed model.

## Discussion

In this study, we examined how and under what conditions career adaptability translates into work engagement. Using Career Construction Theory (Savickas, 2002, 2005) as our theoretical framework, we tested whether enhancing job crafting may explain the previously investigated relationship between career adaptability and work engagement. Our

findings show that enhancing job crafting mediates the positive relationship between career adaptability and work engagement, suggesting that proactively redesigning one's job might be conceptualized as a job-related adapting response within the CCT, which could explain the higher work engagement of more adaptable workers. Furthermore, combining CCT with COR theory, we tested whether this effect is stronger when HPWPs are high. Results partially supported the moderating hypothesis. Only opportunity-enhancing HPWPs moderated the relationship between career adaptability and enhancing job crafting, such that this relationship is stronger for higher levels of opportunity-enhancing HPWPs. Ability-enhancing and motivation-enhancing HPWPs did not moderate the relationship between career adaptability and enhancing job crafting. This suggests that the argument that HPWPs are resources that create an environment in which employees can build a resource pool which they can benefit from only holds for resources (here specifically HPWPs) that enhance employees' opportunities at work, but not necessarily for resources that enhance the abilities or motivation of employees.

A possible reason why career adaptability was found to interact only with this one domain of HPWPs in explaining employees' job crafting behaviors and in turn work engagement, may relate to the definition of job crafting as a job redesign process. Wrzesniewski & Dutton (2001) state that extent to which employees craft their own jobs is influenced by the discretion and freedom they have in their work, such that motivated employees will engage in job crafting behaviors only when they have the opportunities (e.g. autonomy, control and freedom) to do so. Accordingly, previous research found job characteristics such as job autonomy (e.g. Lazazzara, Quacquarelli, Ghiringhelli, & Nacamulli, 2015) and workload (e.g. Wang, Demerouti, & Bakker, 2017) to have a positive relationship with job crafting. Among the HPWPs domains, the opportunity-enhancing domain is the one concerned with job design and involvement practices such as flexible work, enhanced employees' participation and information sharing (Jiang et al., 2012). Opportunity-enhancing HPWPs could thus set conditions under which higher career adaptability translates into job crafting behaviors, and seems to do so more than other HPWP domains. More research is needed to further explore this role of opportunity-enhancing HPWPs as contextual resources.

In sum, our findings contribute to the debate on proactivity and adaptability at work, by showing that career adaptability can trigger higher work engagement through job crafting, and by focusing on the contextual factors in terms of different domains of implemented HPWPs that can enhance this relationship.

### ***Theoretical implications***

This study expands our knowledge on the proactive job-related behaviors associated with high career adaptability, thus adding to the debate around the interplay between adaptability and proactivity at work. When looking at adaptability and proactivity at work, previous research conceptualized them as separate processes, where the first reflects the extent to which a person adapts to changes in a work system or in a work role, and the latter refers to self-directed actions aimed at anticipating or initiating changes in a work system or in a work role (Griffin, Neal, & Parker, 2007). We add to this debate, as our results suggest a link between adaptability and proactive behaviors at work, thus supporting the conceptualization of job crafting as an adapting response in the career construction model of adaptation (Savickas, 2002, 2005). More specifically, our results suggest that proactively engaging in job crafting behaviors is a mechanism through which more adaptable workers increase their work engagement. While it makes sense that individuals with higher psychosocial self-regulation strengths such as career adaptability are more prone to and capable of crafting their jobs and becoming more engaged with their work, more work is needed regarding the relation between career adaptability and job crafting over longer time periods in order to disentangle the interplay between adaptability and proactivity.

Furthermore, this study contributes to the HRM literature, by highlighting the role of HPWPs in setting favorable conditions for the employees to express their adaptability at work through crafting their jobs. Wright & Boswell (2002) urged researchers to investigate the mechanisms through which HRM practices affect individual outcome variables. Our results suggest that for low opportunity-enhancing HPWPs the relationship between career adaptability and job crafting is weaker than for high opportunity-enhancing HPWPs. The CCT model of adaptation explicitly mentions the relevance of contextual factors in the development and expression of one's adaptability. However, so far, there has been a paucity of research investigating what are the environmental elements that might condition the expression of one's adaptability within the work place. In the attempt to extend our knowledge on such moderating mechanisms we use principles stemming from COR theory, which add to the CCT model by providing a framework to understand how internal and external resources interact in affecting employees' adaptive responses. In line with CCT and COR theory we argue that when workers have sufficient individual and organizational resources at their disposal, they are more likely to implement proactive behaviors at work, which contributes to their engagement. We show that when the

employees are provided with high levels of opportunity-enhancing HPWPs, they seem to be more capable of translating their adaptability into job crafting behaviors. Workers with low career adaptability (i.e. fewer individual resources), provided with a low level of opportunity-enhancing HPWPs (i.e. fewer organizational resources related to job design, involvement and participation) instead, may need to restore their resource level and therefore are less proactive and engaged in their work. Thus, both individual and organizational resources are relevant in examining adaptive and proactive processes at work.

Overall, our study responds to the call for more research that bridges the fields of jobs and careers (Akkermans & Tims, 2017; Hall & Las Heras, 2010). As indicated by Hall & Las Heras (2010), the fields of jobs and careers are not as distinct as it may appear, in that they eventually both relate to an individual's work. Jobs are building blocks of one's career, and careers are compounds of job experiences. On the one hand, when making decisions on one job, workers have in mind their whole careers. On the other hand, career-related decisions are driven by the expected characteristics of specific jobs (Las Heras, 2009). Therefore, the fields of career, job and job design could (and should) contribute to and contaminate each other by uncovering spillover effects between them. In line with this, Akkermans & Tims (2017) and Plomp et al. (2016) demonstrated that career competencies and job crafting are related, and are related to employees well-being, as well as perceived employability. We contribute to this line of research by providing empirical support for the link between career self-regulatory strengths, job design and proactivity at work.

### ***Practical implications***

The results of this study have some practical implications for organizations and workers. First, our findings show that organizations could stimulate employee's engagement through enhancing career adaptability. Career adaptabilities are malleable self-regulatory resources that can be enhanced by means of training, coaching and counselling interventions (Potgieter, 2012; Savickas, 2005). Therefore, integrating the development of career adaptability in structured vocational training and assessment programs could not only enhance workers career success but also behaviors and outcomes relevant within their job. Second, organizations could improve employee's job crafting and engagement by implementing opportunity-enhancing HPWPs such as work-life balance practices, participation and information sharing practices. Third, from the employee perspective of the employee, our results suggest that possessing adaptability resources, as well as engaging in proactive behaviors at work may

contribute to feeling more engaged at work. It is crucial in the current flexible and unstable labor market that workers develop adaptive and proactive behaviors that will help them not only transitioning between different jobs but also adapting to altered circumstances within the same job.

### ***Limitations and suggestions for future research***

This study has several limitations. First, the cross-sectional nature of the design makes it impossible to infer causality among the study relationships. Where causality is implied, it is theoretical or based on previous work, and not tested here. In addition, the possibility of reverse causality cannot be ruled out. For example, work engagement may predict job crafting and, as a consequence, increase the career adaptability of the workers. However, as noted, we based the hypothesized model on previous empirical longitudinal findings on career adaptability (Rossier et al., 2012) and job crafting (Petrou et al., 2012) affecting work engagement and not vice versa. Furthermore, CCT argues that the antecedents of career adaptability are stable dispositional traits that respond to the definition of adaptivity (Hirschi et al., 2015). The consequences of career adaptability instead are adapting responses or behaviors that address changing conditions. Thus, from a theoretical standpoint, it is reasonable to argue that career adaptability leads to job crafting in the hypothesized direction. Nevertheless, future research should investigate the hypothesized model in a longitudinal manner to test the direction of the proposed causal relationships. Future research could also use a diary study design to investigate how the relationships between adaptability, proactive behaviors at work, and engagement unfold and change on a daily basis.

Second, the results of this study may be subject to common method bias (Podsakoff, MacKenzie, & Podsakoff, 2012), as data for three out of four variables of the proposed model were collected through self-reported measures. By their nature constructs such as career adaptability and engagement are difficult to measure other than through self-reports, in that they mirror subjective beliefs and attitudes. Similarly, job crafting is not always visible to others. Thus, here we only used other ratings for HPWPs. Future research might consider assessing more concepts with multi-source data, for example relating them with indicators of employees' performance.

Third, in focusing only on enhancing job crafting (i.e. expanding the scope or adding tasks or meaning to the job), we did not examine the role of limiting job crafting (i.e. decreasing stimulation or reducing the complexity of one's job) (Bindl et al., 2014). Based on previous research (Demerouti, 2014; Tims, Bakker, & Derks, 2015) reducing hindering job demands seems to be aimed more at preventing strain rather than



proactively reaching well-being, therefore constituting more a health impairment process than a motivational one (Akkermans & Tims, 2017). From a career construction theory perspective, therefore, possessing adaptability resources might be especially relevant when employees engage in job crafting with the purpose of reducing stress, rather than for actively seeking well-being. Future research could expand on our study by elucidating how and when adaptivity and adaptability are related to enhancing and limiting job crafting, and what the consequences of these behaviors are for adaptation results.

Finally, the results of this study are based on a convenience sample of employees in a variety of industries. This sample is characterized by a relatively low average age and organizational tenure. Future research may replicate our findings on a bigger sample by explicitly focusing on specific settings or by focusing on employees belonging to different age cohorts (e.g. newcomers, aging workers), to investigate whether the proposed adaptive and proactive mechanisms do apply across different moments in one's life and career span.

## Conclusion

In conclusion, the present study aimed at extending our understanding of the job-related behaviors associated with high career adaptability, and the organizational contingencies that can facilitate this mechanism. Results showed that enhancing job crafting mediated the relationship between career adaptability and work engagement, therefore representing a job-related mechanism that is likely to be prompted by high levels of career adaptability. Furthermore, integrating CCT and COR theories, opportunity-enhancing HPWPs were found to moderate the relationship between career adaptability, enhancing job crafting and work engagement.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes

1. Item 5 is 'The subsidiary continuously provides training programs' and item 6 is 'The subsidiary invests considerable time and money in training'. These two items are specifically focused on training programs, whereas the third item measuring training in this scale is 'The subsidiary provides an orientation program for newcomers to learn about the subsidiary', therefore being more focused on orientation programs for newcomers. Allowing residual correlations among item 5 and item 6 takes into account their specific focus on training activities.
2. Item 10 is 'Employee salaries and rewards are determined by their performance' and item 12 is 'Employees receive monetary or nonmonetary rewards for great

effort and good performance'. The residual correlation between these two items recognizes that they are both target at quantifying the extent to which the company provides rewards on the basis of employee's performance.

3. Item 11 is 'The subsidiary attaches importance to the fairness of compensation/rewards', therefore more focused on perceptions of organizational justice, and not extremely related to high-performance work system practices.

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