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

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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 (behavioral 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 behavioral form is very similar to other proactive behaviors 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 behavior, job demands–resources model, approach–avoidance motivation

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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 favorable 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 behaviors that employees take to shape, mold, 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 online 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

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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 online 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

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,

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[1] This search was conducted in September 2018.

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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 coworkers 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

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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 behaviors 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 behavioral 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.

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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 behavior. 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 behavior 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 online 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

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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)

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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 1 (see 1.2), 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 1.1). 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

behavioral 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.

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Insert Figure 1 about here

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 1.1).

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

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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 behavioral crafting

We propose job crafting form—the difference between cognitive and behavioral 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

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with behavioral 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 behavioral crafting have aggregate features. In other words, cognitive crafting and behavioral 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 behavioral crafting (e.g., Niessen et al., 2016; Slemp & Vella-Brodrick, 2013, 2014). The latter relationships might occur because cognitive crafting and behavioral crafting are reciprocally related to each other. For example, drawing on research on the powerful role of cognition in shaping individuals' behaviors, 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 behaviors. Likewise, behavioral crafting can lead to cognitive crafting, such as when tangible changes in a job due to behavioral crafting shape how an individual views his or her new role.

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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 online supplement Table 2), an issue we elaborate later when we discuss the measurement of crafting.

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Eight types of crafting arising from the proposed hierarchical structure

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 behavioral or cognitive, and both behavioral and cognitive approach crafting can be resource-focused or demand-focused. This classification defines four types of approach crafting. First, *approach resources crafting (behavioral)* 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 (behavioral)* 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 behavioral or cognitive, and both behavioral 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 (behavioral)*, 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 (behavioral)* refers to stepping away from or avoiding hindering demands, such as withdrawing from

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situations with unfavorable 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

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[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.

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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.

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Insert Figure 2 about here
....

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 behavioral 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/behavioral 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 behavior is

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defined as self-directed and future-focused behavior in which individuals aim to bring about change

to the situation and/or within themselves (Parker, Bindl, & Strauss, 2010). As a behavior, approach

crafting fits into the above definition, and thus is a type of proactive behavior (specifically, a type of

proactive person-environment fit behavior; 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 behavior (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 behavior (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 behavior. 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

behaviors 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

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of avoidance crafting tend to include fairly simple withdrawal-oriented behaviors 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 behavior rather

than simple withdrawal.

Insert Figure 3 about here

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 online 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 behavioral crafting and cognitive crafting. Some empirical studies have used composite

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overall job crafting, the combination of approach crafting and avoidance crafting (e.g., Akkermans &

Tims, 2016; Tims et al., 2016; Travaglianti, Babic, & Hansez, 2016; Tuan, 2018) or combination of

behavioral 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 behavioral/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

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task crafting, which can be seen as both approach resources crafting and approach demands crafting.

Crucially, in what follows, we focus almost exclusively on behavioral forms of crafting as there is

little empirical evidence concerning cognitive crafting.

Insert Figure 4 about here

Antecedents of approach crafting

Above, we argued that approach crafting is a type of proactive behavior. 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

behavior (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 behavior (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

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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 behaviors.

Proactivity literature has indicated other individual differences related to proactive behavior,

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 favorable 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 behaviors, proactive behavior 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

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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.

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(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 behavior 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 (2016) 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

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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

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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

behavior 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 behavioral 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.

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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 coworkers (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 behaviors, thus preventing avoidance and withdrawal behaviors (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;

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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, 2016), career satisfaction and commitment (Kim & Beehr, 2018) and objective

promotions (Cenciotti, Alessandri, & Borgogni, 2016).

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, 2015), organizational commitment (Cheng et

al., 2016; Rofcanin et al., 2015; 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 coworkers, but empirical

studies have indicated the positive effect of individual approach crafting on coworkers. Specifically,

Bakker, Rodríguez-Muñoz, and Sanz Vergel (2016) indicated that employees observed and imitated

their coworkers' crafting behavior. Actor approach crafting was also positively related to coworker

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work engagement via the coworker's approach crafting. Similarly, at the day level, Peeters, Arts, and Demerouti (2016) found a direct crossover of approach demands crafting from actor to coworker. Actor approach resources crafting only transferred to coworkers when the coworker 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

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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 coworker support. Specifically, the positive relationship between approach crafting and work engagement was stronger when coworker 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, Peters et al. (2016) found that only daily approach resources crafting was positively associated with both self-rated and other-rated

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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 behavior, 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 coworkers.

In a study of dyads, Bakker et al. (2016) theorized and found that actor avoidance demands crafting

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was associated with lower coworker work engagement, without any mediating role of coworker

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 coworker disengagement. It may

be that burned-out employees have negative job attitudes and behaviors, 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).

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Insert Table 1 about here
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Above, we reviewed the antecedents and outcomes of behavioral 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 behavioral 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).

Implications and Future Directions

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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 behavior, 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 behavioral 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 behavior 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 behavioral 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.

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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 demand 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

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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 behavioral 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 behavioral 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

behaviors. 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

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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

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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 behavior (Searle and Auton, 2015). It is therefore necessary to consider individual appraisals as antecedents (Lepine et al., 2005).

Outcomes of job crafting

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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-centered 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 behavior) but not with work-related attitudes, such that moderate levels of crafting show dysfunctional effects on performance that then

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become functional at higher levels of crafting. According to role theory, when job crafting behaviors

became moderate enough to be noticed, managers and coworkers 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 behaviors, which makes job crafting

behaviors 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 behaviors may or may

not be integrated well with organizational functioning, it would also be helpful to investigate how

managers and coworkers' 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 behavior as well as the outcomes of job crafting. Gordon et al. (2015) compared the job

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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 (2017) 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., 2016; 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

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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. (2016) 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., 2016; 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

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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 behavior, so when team members work

together to change their jobs, this can also stimulate individual job crafting behavior (Tims et al.,

2013).

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Tables and Figures

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)
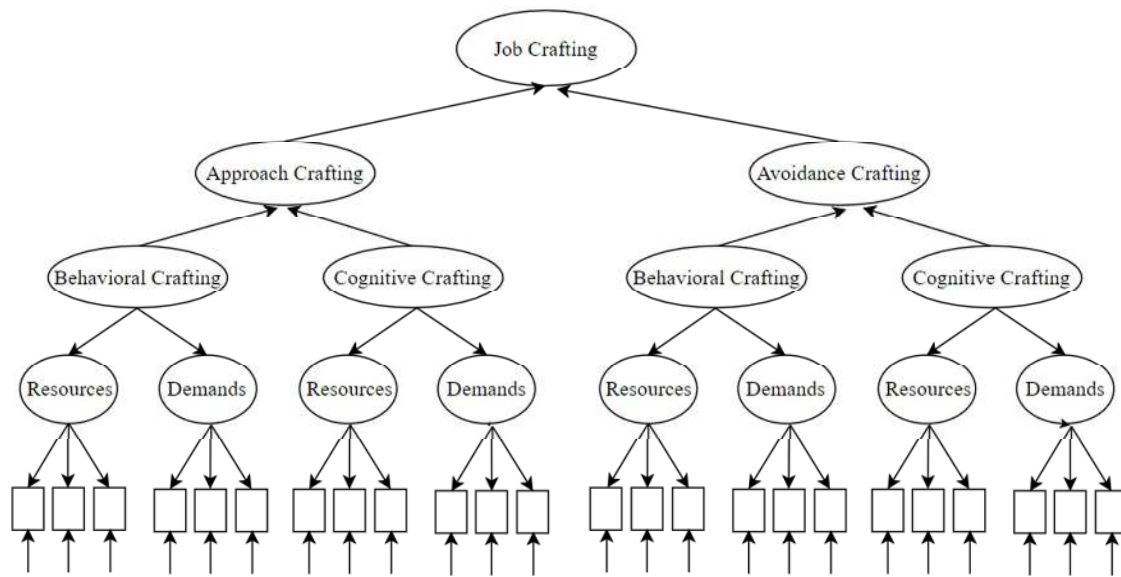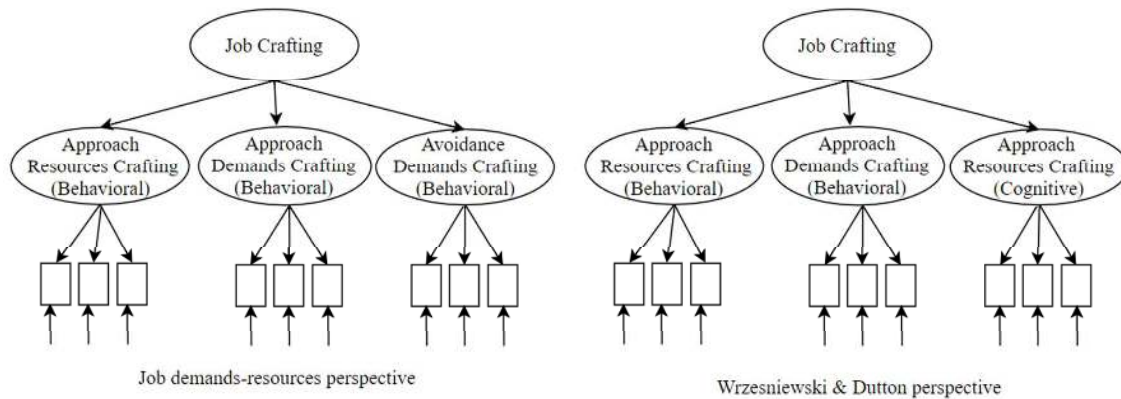
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Figure 1.1: The proposed hierarchical structure of job crafting

Figure 1.2: Job crafting structure from existing perspectives

Figure 2: The eight types of job crafting

Approach Crafting (Behavioral) (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 (Behavioral)	**Approach demands crafting (Behavioral)**	**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 (Behavioral) (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 (Behavioral)	**Avoidance demands crafting (Behavioral)**	**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 3: Job crafting and related concepts

Figure 4: Individual level of job crafting research

Antecedents

Job characteristics
Job autonomy [a/c/d]
Skill variety/skill utilization
Task identity
Task significance
Job enlargement
Workload [a]
Task interdependence
Job resources (social support, feedback, LMX)
Job demands (work pressure [c/d], cognitive and emotional demands)
Individual differences
Demographics and education [a]
Organizational rank [d]
Proactive personality [a/c/d]
Big-Five personality [a]
Dark personality
Approach/avoidance temperament [c]
Regulatory focus [a/b/d]
Motivational characteristics
Self-efficacy [a/c]
Perceived self-competence
Psychological capital
Future time perspective
Work engagement
Burnout
Workaholism
Organizational embeddedness
Affective commitment
Need for control, self-image, human connection
Social context
Leadership styles
Leader-subordinate autonomy expectations
Contact's job characteristics

Job crafting

Approach resources crafting
Approach demands crafting
Avoidance demands crafting

Processes

Changes in job resources and demands [c]
Person-job fit
Work engagement
Burnout
Need satisfaction
Sense of calling
Work sense of coherence

Job autonomy
Ambiguity
Social support
Interdependence
Perceived organizational support
Autonomy support
Coworker emotional and instrumental support
Occupational role salience
Organizational change context

Outcomes

Individual attitudes
Person-job fit [c]
Meaningfulness
Work engagement [a/b/c/d]
Job satisfaction [a/b]
Organizational commitment [c/d]
Job boredom
Intention to leave/stay [a/e]
Individual behaviors
Task and contextual performance [a/b/c/d/e]
Creativity [e]
Adaptivity [e]
Counterproductive work behavior [c/e]
Individual well-being
Psychological and subjective well-being
Need satisfaction [c]
Positive/negative affect
Burnout [b/c/d]
Job strain [a]
Psychological distress
Other outcomes
Psychological capital
Employability
Coworker's job crafting behavior, attitudes, well-being

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).

Online supplements

Table 1: Job crafting measures from different perspectives

Measures from Wrzesniewski & Dutton's (2001) perspective

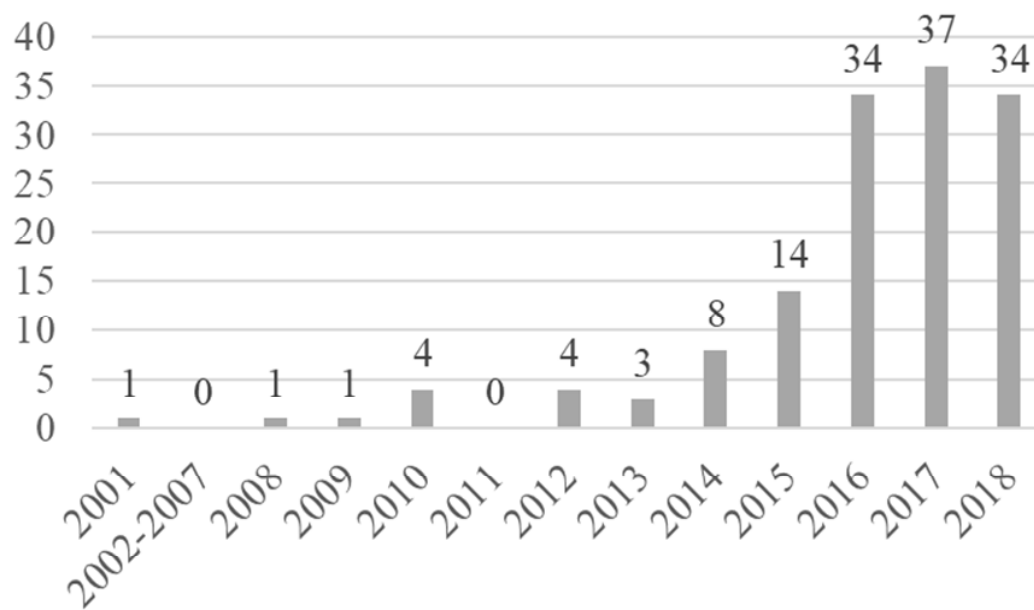| Authors	Sample	Country	construct
Leana et al (2009)	206 teachers and 130 aides	America	Individual job crafting (6 items)
			Collective job crafting (6 items)
Laurence (2010)	163 employee and supervisor dyads	Japan, China	Physical expansion-oriented job crafting (11 items)
			Physical contraction-oriented 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)
			Work role expansion (5 items)
Bruning & Campion (2017)	196 employees and 50 supervisors	America	Work organization (4 items)
			Adoption (5 items)
			Meta-cognition (5 items)
			Work role reduction (4 items)
			Social expansion (4 items)
			Withdrawal (3 items)
			Work role reduction (4 items)
Kooij	136 employees		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)

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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).

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

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

Web of Science: 208 hits

EBSCO BSC: 172 hits

PsycINFO: 177hits

ProQuest: 179 hits

ScienceDirect: 30 hits

766 total records identified

218 records after 548 duplicates removed

77 records exclued, based on screening titles and abstracts

141 records followed up for eligibility

16 records excludedd: No access to full-text: (n=8) Job crafting intervention (n=8)

125 studies included in the review