

**When do Job Crafting Interventions Work? The Moderating Roles of Workload,
Intervention Intensity, and Participation**

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Abstract

Job crafting refers to self-initiated, proactive strategies to change work characteristics to better align one's job with personal needs, goals, and skills. This study evaluated the conditions under which job crafting interventions are effective for increasing job crafting behaviours. We assessed the impact of initial workload on the effectiveness of two interventions – a less intense, knowledge-reflection intervention ($N=39$), and a more intense, knowledge-reflection-action intervention that involved completing Job Crafting Boosts over four weeks ($N=50$). Irrespective of intervention, longitudinal growth modelling analyses revealed that those with high initial workload engaged in more crafting behaviours to decrease hindering demands, whereas those with low initial workload engaged in more crafting behaviours to increase structural resources. No significant differences were observed between intervention groups in any job crafting behaviours. A further goal of the study was to examine, for those in the knowledge-reflection-action intervention, how much the participants actively participated in Job Crafting Boosts. Engagement varied considerably, with the average participation being below the target of three Job Crafting Boosts per week. Content analysis of open-ended responses to questions revealed that, for those who did engage in the Job Crafting Boosts, there were positive experiences, including insights about making positive changes at work, increased vigour and motivation, increased productivity, and resolved problems. This research shows that: interventions to reduce hindering demands should be targeted at those high in initial workload; interventions to increase job resources should be targeted at those low in initial workload; and intervention intensity does not impact intervention effectiveness. *Keywords:* job crafting intervention; workload; job resources; challenging demands; hindering demands

Introduction

Job crafting is a powerful way by which individuals can change their work design. Job crafting refers to the self-initiated strategies that individuals use to change aspects of their work to align them more with their personal needs, goals, and skills (Tims et al., 2013; Wrzesniewski & Dutton, 2001). Examples of job crafting include seeking support from colleagues, asking for feedback from a supervisor, and/or enquiring about training and development opportunities. Many studies have shown that, by proactively crafting aspects of their work in these ways, individuals experience improved well-being, work engagement, and performance (see meta-analyses of Lichtenthaler & Fischbach, 2018 and Rudolph et al., 2017 and reviews of Lazazzara et al., 2019, and Zhang & Parker, 2019). This type of changing work design is therefore a bottom-up approach by which individuals tailor their jobs to meet their own needs, goals, and skills. Job crafting contrasts with top-down work redesign approaches that involve implementing changes that affect everyone in a whole department or organization, whether or not the employee embraces the change (Hornung et al., 2010).

Given the growing amount of research that demonstrates the associations between job crafting behaviours, antecedents, and outcomes (Zhang & Parker, 2019), researchers have developed interventions in which employees learn to craft their jobs in order to improve their work motivation and performance (e.g., Gordon et al., 2015; Van Wingerden et al., 2016). A recent meta-analysis identified 14 job crafting intervention studies and found positive and significant effects of job crafting interventions on overall job crafting, as well as on specific job crafting behaviours to increase job challenges and to decrease hindering job demands (Oprea et al., 2019). Additionally, positive, significant effects were found on work engagement and contextual performance, supporting the value of job crafting interventions for positively changing work behaviours and impacting employee outcomes, such as well-being and job performance.

However, results from individual intervention studies reveal inconsistent findings across different types of crafting. Oprea and colleagues' (2019) meta-analysis reported confidence intervals for the effect of interventions on job crafting and sub-dimensions which were sufficiently wide to suggest moderators (overall job crafting, $g=.26$, 95%-CI=.09-.44; seeking job resources, $g=.19$, 95%-CI=.01-.38; reducing hindrance demands, $g=.57$, 95%-CI=.15-.99). As an example of the inconsistent effects in individual studies, Dubbelt, Demerouti, and Rispens (2019) and Van Wingerden et al. (2017a) reported that their job crafting intervention increased seeking resources and decreasing demands behaviours, but did not increase seeking challenges. In another study, Van Wingerden et al. (2017b) reported that the job crafting intervention increased seeking challenges but did not increase seeking resources, nor did it affect decreasing hindering demands.

Given these inconsistencies across job crafting intervention studies, it is important to consider why interventions are, or are not, successful, and to discuss how well interventions are designed or implemented (Briner & Reynolds, 1999; Nielsen & Miraglia, 2017). That is, research has yet to answer, *under what conditions* job crafting interventions are most successful in inducing more crafting, that is, what factors – such as workload and intervention intensity– shape intervention effectiveness? Without this information, the field is at risk of settling on erroneous conclusions, which hinders the effective design of future interventions. It is therefore important to shed light on the implementation of the intervention, alongside traditional analyses of intervention effectiveness. At the same time, it is important to understand which aspects of job crafting are affected by crafting interventions.

In this study, for a sample of managers and professionals, we report on the implementation of two job crafting interventions, focusing on the question as to under which conditions job crafting interventions succeed in stimulating particular job crafting behaviours. Specifically, we pursue four goals. First, we examine an important boundary condition that

may shape the type of crafting behaviours that individuals engage in, namely workload. Individuals need initial resources to engage in proactive behaviours because these behaviours can consume considerable resources, such as time and mental energy (Parker et al., 2013). We draw on conservation of resources (COR; Hobfoll, 1989) theory to predict that workload will shape the type of job crafting that is stimulated by job crafting interventions. If workload is high, individuals will be motivated to invest in types of job crafting that protect against future resource loss, such as decreasing their hindering job demands, whereas if workload is low, we expect that individuals will be motivated to engage in types of job crafting that will build their resources, such as increasing structural job resources. To our knowledge, workload is thus far unexplored as a situational factor that may facilitate or hinder engagement in particular job crafting behaviours, even though there is strong theoretical and empirical evidence that workload has important ramifications for how one feels and behaves at work (Jex, 1998; Prem et al., 2018).

The second goal of this study is to evaluate whether intervention intensity influences the extent to which individuals engage in job crafting behaviours post-intervention, to evaluate whether intervention intensity might be able to explain differences in intervention effectiveness. We compare two job crafting interventions that vary in intensity. The first, less intense, intervention, which we refer to as a ‘knowledge-reflection’ intervention, provided education around job crafting, and encouraged participants to analyse and reflect on their own work design. The second, more intense intervention, which we refer to as a ‘knowledge-reflection-action’ intervention, incorporated all elements of the ‘knowledge-reflection’ intervention, and additionally included weekly encouragement over four weeks to engage in specific job crafting activities, which we call Job Crafting Boosts. Specifically, participants were encouraged to engage in at least three Job Crafting Boosts per week by selecting from a curated list, and were reminded weekly to engage in these Boosts by the researchers. Each

Boost focused on a specific type of crafting, for example, by building job or social resources such as feedback, training opportunities, and colleague support, or reducing ‘hindering’ demands, such as eradicating excessive emails or mundane tasks. Examples include learning a new skill, brainstorming with colleagues, identifying interesting projects and negotiating involvement, and reducing distractions. Drawing on intervention research in different areas, intervention intensity has been associated with better outcomes following the intervention (e.g., Duhon et al., 2009; Schwichtenberg & Poehlmann, 2007). However, this idea has not received empirical scrutiny in designing job crafting interventions.

The third goal of this study is to delve more deeply into how much participants actually engage in an intervention and for how long. To our knowledge, studies have not yet measured *how many* job crafting activities individuals have partaken in, or *what types*. This means that we do not know to what extent individuals carry out crafting behaviours at work after engaging in a job crafting intervention. Addressing this goal was possible in our knowledge-reflection-action intervention because we assessed the number and type of Job Crafting Boosts that each participant completed at work. Building on research about the transfer of training, being able to perform the learned behaviour in the work context is crucial for an intervention to be considered successful (Van der Locht et al., 2013; Volet, 2013).

Our fourth goal is to evaluate participants’ subjective experiences of the knowledge-reflection-action intervention. Through the short online evaluation survey that participants completed following each Job Crafting Boost, and which acted as an opportunity for further reflection following each Boost, we gained quantitative and qualitative information enabling us to contextualise the results from the surveys and gain further insight into how workload impacts individuals’ perceptions of effectiveness of this more intensive intervention. Nielsen and Randall (2013) highlighted the importance of evaluating participants’ subjective experiences in addition to more traditional analyses of evaluation effectiveness (e.g.,

between-subjects, repeated measures analyses of variance) to prevent erroneous conclusions. For example, it may be possible that statistically significant results for intervention effectiveness are not found, but that participants themselves perceive that the intervention has been effective. Results from this type of holistic analysis, in which both statistical effectiveness of interventions and also participation is taken into account, may also indicate how practical such an intervention is for participants, with low participation rates suggesting a less intense intervention is more feasible, informing the design of future interventions..

Taken together, by investigating the role of workload, the intensity of the intervention, and participation in / subjective experiences of the knowledge-reflection-action intervention, our study helps to tease apart theoretical and practical reasons for job crafting intervention success, as well as helping to explain why some interventions affect particular types of crafting but not others. We support our findings with both quantitative and qualitative data, increasing the robustness of our conclusions. In what follows, we elaborate the theory underpinning these goals and develop specific hypotheses.

Job Crafting and Work Design

Work design refers to the nature and organization of tasks, roles, relationships and responsibilities that individuals hold at work (Parker, 2014). Much research has shown that work which is high in positive job characteristics, or job resources, such as autonomy, feedback and social support, with moderate job demands, such as workload and time pressure, is beneficial for work motivation, well-being and performance (Bakker & Demerouti, 2007; Humphrey et al., 2007; Parker et al. 2017). Job crafting is one way in which work can be redesigned to increase work quality. Wrzesniewski and Dutton (2001) first coined the term job crafting, defining it as ‘the physical and cognitive changes individuals make in the task or relational boundaries of their work’ (p.179). From this theoretical perspective, individuals self-initiate changes to the type and scope of tasks they

conduct at work, the quality or frequency of interaction with others at work, and/or the way they cognitively frame or view their job.

A follow-up school of thought approaches job crafting from job demands-resources theory (JD-R; Bakker & Demerouti, 2007). This perspective proposes that individuals craft their jobs to balance their job demands and resources (see Tims & Bakker, 2010). Job demands refer to aspects of the job which require sustained cognitive, emotional or physical effort, such as workload, dealing with time pressure, or challenging customer interactions (Bakker & Demerouti, 2007). Job resources refer to aspects of the job, or work characteristics, which help individuals achieve work goals, reduce job demands, or stimulate growth and development (Bakker & Demerouti, 2007), such as job autonomy, feedback, and social support. Tims et al. (2012) empirically validated four types of crafting: i) increasing structural job resources, when individuals increase job resources such as autonomy, variety, and development opportunities; ii) increasing social job resources, which refers to increasing relational characteristics such as social support and feedback from others; iii) increasing challenging job demands, which is when individuals take on extra tasks, roles or responsibilities which are stimulating as opposed to a hindering; iv) decreasing hindering job demands, when individuals reduce the number of tasks which require sustained effort and are not motivational. Recently, these two job crafting perspectives have been integrated, with researchers showing how they conceptually and empirically relate to each other (Zhang & Parker, 2019; Bruning & Campion, 2018). However, since most empirical intervention research tends to adopt Tims and colleagues' (2012) perspective (see Oprea et al., 2019), for reasons of comparability, we adopt the JD-R perspective on job crafting in this research.

Job Crafting Interventions

Intervention studies are stronger tests of theory than other research designs due to their longitudinal nature and manipulation of key variables of interest (Higgins & Green, 2011).

Intervention studies are also important from a practical perspective, demonstrating to organisations and individuals that it is possible to achieve change. In their meta-analysis, Oprea and colleagues' (2019) found that creating Job Crafting Plans involving both organizational and personal goals boosted the effectiveness of interventions. Occupation did not have a moderator effect on overall job crafting. These results should be interpreted with caution, however, given the low study numbers (K=14) which reduces robustness, and the limited number of occupations and settings upon which moderator analyses were based. Other moderators were not tested, suggesting that there is still much to be understood about how and why job crafting interventions work. This includes understanding the impact of workload, and whether the intensity of interventions (i.e. how demanding an intervention is of an individual's time and effort), or the extent that individuals participate (i.e. whether they actually carry out job crafting behaviours) have an impact on intervention effectiveness for increasing job crafting behaviours.

Job crafting intervention studies have demonstrated mixed results. For example, some have reported increases in all types of job crafting behaviours following the intervention (e.g. Van Wingerden et al., 2016, Van Wingerden et al., 2017c; Demerouti et al., 2017; Sakuraya et al., 2017), whereas others have shown some positive effects on some job crafting behaviours some of the time (e.g. Van Wingerden et al., 2017a; Van Wingerden et al. 2017b; Demerouti et al., 2017; Van den Heuvel et al., 2015; Gordon et al., 2018). This suggests that there are important differences in the types of crafting fostered across studies. Why these differences exist, however, is not well understood. We focus on the key role of workload in helping to understand the diverse effects of job crafting interventions, as well as the role of intervention intensity.

Workload as a Moderator of Job Crafting Interventions

JD-R theory suggests that job crafting is only possible when job demands are

manageable, implying that people have the capacity and the resources to engage in job crafting behaviours (Bakker, 2011). Workload, as a key job demand, is therefore an important moderator to consider in job crafting interventions. Previous empirical interventions have not considered the moderating impact of job demands on job crafting behaviours.

We draw on COR theory to help explain why workload is an important moderator of job crafting behaviours. COR theory proposes that individuals try to protect their current resources as well as gain resources (Hobfoll, 1989). From this perspective, resources refer to: objects, such as homes, cars, and other personal belongings; personal characteristics, such as self-esteem, your attitude towards events which happen to you, and a sense of mastery over challenges faced; conditions or roles, such as marriage, and work and family roles, and; energies, such as time, money and knowledge (Hobfoll, 1989). Hobfoll suggested that individuals value the resources they have and use them to obtain more of these same resources. Threats from the environment, however, can make people afraid that they will lose these valued resources. In the work domain, threats to one's role, work relationships, and sense of mastery over one's job could occur in the form of job insecurity, work overload, or negative feedback about your work performance from a supervisor, for example. Losing resources can lead to psychological stress (Hobfoll, 1989). In these situations, individuals are motivated to replenish their resources.

When job demands are low or moderate, COR theory predicts that individuals are able to craft their jobs using the resources they have, and therefore are more likely to focus on accumulating more resources for the future so as to proactively protect against possible future resource loss, or to enhance current resources in accordance with personal goals and desires (Hobfoll, 1989). We therefore expect to see that individuals with low to moderate demands will be more likely to use their resources to gain more resources, by increasing behaviours directed towards increasing structural job resources, such as more autonomy from colleagues,

social resources, such as developing working relationships with colleagues, and challenging job demands, such as starting new projects.

When job demands are high, however, COR theory suggests that individuals are likely to feel threatened that they will lose their current resources, and are too resource deficient to invest energy in self-initiating behaviours to build more resources. In this situation, individuals are likely to engage in behaviours directed at protecting the resources they do have, such as by managing or reducing their demands. For example, individuals might reduce a high workload by delegating tasks to others or negotiating new deadlines. Proactivity theory supports this view, by proposing that proactive behaviour, such as job crafting, requires initial energy and resources, which are then invested in creating more resources (Parker et al., 2010). According to this view, when workload is high, job crafting aimed at increasing job resources and job challenges will be limited. Instead, individuals are likely to invest any resources they do have in managing those demands, and thus are likely to engage in behaviour to reduce hindering job demands.

Furthermore, person-job fit may be achieved when individuals proactively craft their jobs so that work characteristics are aligned with their needs, goals, and skills (Kristof-Brown et al., 2005; Tims et al., 2010). Individuals can fulfil these needs and desires by moulding their jobs through job crafting (Tims et al., 2016). For example, an individual who particularly likes working with people might actively seek work roles or tasks which involve face-to-face contact with others, or an employee who is keen to learn and develop might actively discuss training opportunities with a supervisor. When workload is manageable, individuals have the capacity to reflect on their work tasks, relationships, and goals, and self-initiate changes to strive towards these, building job resources. When workload is high, however, individuals are likely to perceive a misalignment between person-job fit, motivating them to try and reduce their demands and improve fit.

Despite these strong theoretical underpinnings for workload as a moderator of job crafting interventions, few studies have investigated the role of workload in shaping the success of such interventions, and the results are mixed. A qualitative study found results consistent with theory, with teachers experiencing a high workload and a high pressure environment most commonly reporting job crafting activities directed at reducing job demands. Nevertheless, 55% of these activities were not successfully completed, with lack of time and time pressure cited as explanatory reasons (Van Wingerden et al., 2013). As such, demands did not decrease following the intervention. This study did not compare the results to a low workload sample, limiting conclusions. In an empirical intervention study, Van Wingerden et al. (2017a) also found that levels of workload did not change following a job crafting intervention, although behaviours to manage hindering job demands increased. The authors speculated that this could have been due to participants becoming more aware of demands following job analysis but it is unclear why workload did not subsequently reduce.

Other, non-intervention studies, have found different results when investigating workload as a moderator of job crafting behaviours. A two-wave, cross-lagged panel study found that role overload was negatively related to job crafting, but this relationship was moderated by perceived adaptivity such that when role overload was high, those who perceived their adaptivity to be high were also able to job craft (Solberg & Wong, 2016). Similarly, Petrou et al. (2012) found that individuals with active jobs characterized by high levels of job resources (i.e., job autonomy) and high levels of job demands (i.e., work pressure) are more likely to invest in crafting job resources and less likely to invest in activities to reduce their job demands (no effect was found for increasing challenging job demands). These cross-lagged and correlational studies, respectively, are unable to determine causality, limiting conclusions and theory development.

In sum, there are limited and mixed results relating to the moderating effect of

workload, despite strong theoretical reason to expect such a relationship. Further, there are methodological challenges with both existing intervention and non-intervention studies that limit the conclusions that can be drawn. In accordance with COR theory and proactivity theory, we hypothesize the following moderating effect of work load:

Hypothesis 1: Compared to those with a lower workload, those with a higher initial workload (Time 0) will report, post-intervention, an increase in their levels of job crafting behaviours to decrease hindering demands relative to their pre-intervention levels.

Hypothesis 2: Compared to those with a higher workload, those with a lower initial workload (Time 0) will report, post-intervention, an increase in their job crafting behaviours to increase structural or social job resources, or challenging job demands, relative to their pre-intervention levels.

Intervention Intensity

We expect that the effect of the intervention will be stronger for those who complete an intense intervention (knowledge-reflection-action intervention) involving Job Crafting Boosts (activities) and post-Boost evaluation questions. This is because Boosts are intended to actively prompt and remind individuals to engage in crafting behaviours, and the evaluation questions are intended to encourage reflection, learning, and motivation to carry out more Boosts. COR theory and proactivity theory can help explain why an intensive intervention is likely to have a stronger effect on crafting behaviours than a less intensive intervention. The central tenet is that individuals need initial resources in order to proactively craft (Parker et al., 2010; Tims et al., 2013). Proactivity theory states that proactivity is about ‘making things happen’ (Parker et al., 2010, p. 827), rather than passively ‘letting things happen’. It involves setting a future-oriented goal as well as striving to achieve that goal, and is driven by ‘can do’, ‘reason to’, and ‘energised to’ motivational states (Parker et al., 2010). Parker et al. (2010) argued that the uncertainty associated with self-initiating new behaviours requires

high levels of motivation, self-efficacy and positive affect to overcome the ‘risks’ involved in this sort of behaviour (Parker et al., 2010). Providing Boosts makes it easier for individuals to engage in job crafting in the knowledge-reflection-action intervention as the amount of initial effort required to initiate crafting behaviours is reduced. This is because, by providing a list of Boosts which individuals can choose from, and by encouraging individuals to carry them out during their work week, individuals do not need to invest cognitive energy to create their own Boosts, nor do they need to rely solely on their own motivation to carry them out. Altogether, the amount of self-initiative required to engage in these activities is reduced. In contrast, in the knowledge-reflection intervention, individuals would need to plan, as well as carry out, their own ‘Boosts’, or job crafting activities, which would require more initial energy investment, and a higher level of self-initiative throughout the intervention. We would therefore expect the knowledge-reflection-action intervention to result in higher perceptions of job crafting behaviours than the knowledge-reflection intervention.

Furthermore, individuals who engage in Boosts will experience ‘can do’, ‘reason to’ and ‘energised to’ motivational states (Parker et al., 2010) which will drive their crafting behaviour and encourage them to engage in further crafting. More specifically, successfully completing Boosts is encouraging, enhancing self-efficacy and individuals’ beliefs that they can change their work design (‘can do’) further, through completing more Boosts. This means individuals are more likely to try out new ways of working. Completing the evaluation questions following each Boost reminds individuals why they are important, thus making salient reasons why they would want to change aspects of their work (‘reason to’). Finally, individuals are likely to experience positive emotions in response to the idea of changing their work for the better and thus invest energy in these changes (‘energized to’). By providing Boosts, we facilitate the experience of these proactive motivational states in individuals in the knowledge-reflection-action intervention and therefore promote

engagement in job crafting behaviours.

In line with these arguments, we predict that under conditions of high workload, individuals in the knowledge-reflection-action intervention will be more likely to engage in Boosts to reduce hindering demands than those in the knowledge-reflection intervention. Although COR theory predicts that both groups will be motivated to protect and manage resources when workload is high, we expect to see more engagement with these behaviours in the knowledge-reflection-action intervention as providing Boosts is theorised to decrease the amount of energy individuals need to invest in these proactive behaviours. Similarly, under conditions of low workload, the amount of energy initially required to engage in Boosts in the knowledge-reflection-action intervention will also be reduced, facilitating greater engagement in Boosts directed at gaining resources, than in the knowledge-reflection intervention. Our hypotheses are as follows:

Hypothesis 3: Under conditions of high workload pre-intervention (Time 0), a knowledge-reflection-action (high intensity) job crafting intervention will be more effective than a knowledge-reflection (low intensity) intervention for decreasing hindering demands post-intervention.

Hypothesis 4: Under conditions of low workload pre-intervention (Time 0), a knowledge-reflection-action (high intensity) job crafting intervention will be more effective than a knowledge-reflection (low intensity) intervention for increasing structural job resources, challenging job demands, and social job resources post-intervention.

Active Participation in Job Crafting Interventions

Previous job crafting intervention studies have rarely, if at all, investigated how much individuals actually engage in crafting after the initial workshops or training. If individuals do not actively participate in interventions, or planned activities are not carried out, intervention effectiveness may be impeded (Carroll et al., 2007; Nielsen & Miraglia, 2017). Carroll and

colleagues (2007) argued that the content of an intervention may be considered its ‘active ingredients’, with participation being one of those key ingredients. According to this view, acceptance of the intervention by participants is crucial to their engagement. Similarly, Argyris (1995) argued that knowledge and practices which are verbalised need to be internalised, adopted, and practised by individuals in order to effect change in organisations. In support, Nielsen and Randall (2012) found that in a teamworking intervention, participation, and changes in work procedures predicted post-intervention autonomy, social support and well-being. In addition, poor implementation, including lack of employee participation, may lead to insignificant findings which obscure the positive impact perceived by people who did invest in the intervention. This is important as it suggests that the intervention could have had wider effects under more conducive circumstances.

Given the above, as part of our analyses, we assess the degree of participation in the ‘knowledge-reflection-action’ intervention, in order to understand whether and how actually carrying out Job Crafting Boosts affects results¹. In particular, we explore the impact of initial workload level on the extent of participation, in terms of the number and type of Job Crafting Boosts completed, and individual experiences of taking part. COR theory suggests that those with a higher workload are less likely to engage in crafting job resources and taking on new activities. In our study, there were more Boosts overall aimed at increasing resources and challenging job demands than at decreasing hindering demands. We therefore expect those with a higher workload to complete fewer boosts overall. This is likely to impact the success of the knowledge-reflection-action intervention. Further, and in line with hypotheses 2 and 3, we predict that those with a higher initial workload are likely to engage in more Job Crafting Boosts to reduce hindering demands than those with a lower initial

¹ It was not possible to measure the degree of participation in the knowledge-reflection intervention as, by design, this group did not carry out Job Crafting Boosts.

workload. Conversely, those with a lower initial workload will carry out a greater number of Job Crafting Boosts to increase structural or social job resources, or challenging job demands, than those with a higher initial workload. Our final hypotheses are thus as follows:

Hypothesis 5: Participants in the knowledge-reflection-action intervention with a higher initial workload (Time 0) will carry out fewer Job Crafting Boosts overall than those with a lower initial workload.

Hypothesis 6: Participants in the knowledge-reflection-action intervention with a higher initial workload (Time 0) will carry out more Job Crafting Boosts to decrease hindering demands than those with a lower initial workload.

Hypothesis 7: Participants in the knowledge-reflection-action intervention with a lower initial workload (Time 0) will carry out more Job Crafting Boosts to increase structural or social job resources, or challenging job demands, than those with a lower initial workload.

In addition, research suggests that the effectiveness of interventions will be shaped by individuals accepting the intervention, applying their newly acquired knowledge to change their work practices (Carroll et al., 2007; Argyris, 1995). Therefore, beyond testing the above hypotheses, we examined themes from an open text evaluation question completed after each Boost to explore people's experiences of engaging in the intervention. Responses provided insight into how individuals felt about the intervention, and their learning and engagement.

We base our study on Australian participants, who we believe face similar work challenges, such as high workloads, to those reported in European countries where much of the job crafting research has been conducted (Oprea et al., 2019). This is because Australia, like European countries, is a developed country with the majority of workers in secondary and tertiary industries. We therefore believe there is an opportunity for job crafting to be used by Australian workers as a means to protect and gain resources, and manage demands.

Material and Methods

Design and Participants

Two job crafting interventions were compared, a knowledge-reflection intervention ($n=39$) and a knowledge-reflection-action intervention ($n=50$). Survey measurements occurred during the first week (Time 0), four weeks later (Time 1), and – to increase the rigour and robustness of our findings - eight weeks following Time 0 (Time 2; see also Figure 1). Working professionals and managers who were voluntarily undertaking a self-development and leadership module as part of a part-time MBA at a leading university in Australia formed the intervention groups. This module was repeated twice a year with different cohorts. To avoid cross-contamination between groups and to maximise sample size, the first cohort formed the ‘knowledge-reflection’ intervention group and the second cohort formed the ‘knowledge-reflection-action’ group.

At Time 0, 63% of the participants were male, with a mean age of 37.28 years ($SD=6.56$). 90% were in full-time employment. Most people worked in general management roles (17.8%), followed by finance and accounting (14.4%), sales & marketing (10%), and information technology (10%). Participants supervised between 0 and 160 employees ($M=10$; $SD=26.87$). Between groups one-way anovas confirmed that the two groups were equivalent at Time 0 in terms of demographics (age, gender, work status, industry, work area, and number of people supervised) and research variables (job crafting behaviours and workload). This mitigates the possibility of initial biases between groups.

Due to space constraints, some materials and results have been placed in supplementary material. All material is referred to appropriately in the following text.

Knowledge-Reflection Intervention Procedure

As part of the module curriculum, education was provided around work design and job crafting for all participants. Following this, all participants took part in an adapted version of the Michigan Job Crafting Exercise (JCE; Berg et al. 2008), which our literature search

revealed is commonly used successfully in job crafting interventions (e.g. van Wingerden et al., 2016; 2017a, 2017b; 2017c). This exercise consisted of job analysis in which individuals assessed their jobs in terms of the types of tasks they completed at work, which tasks they preferred, and which they liked least. Reflection followed, in which individuals considered which things they would like more of in their jobs, and those they might like to reduce.

Unlike previous interventions, and in keeping with our intention to make this a less intensive intervention, individuals were not specifically instructed to make an individual job crafting plan or carry out activities aimed at achieving specific job crafting goals. Individuals were, however, invited to complete each of the three ‘core’ surveys in order to capture their job crafting behaviours.

Knowledge-Reflection-Action Intervention Procedure

The knowledge-reflection-action intervention group received the same education about work design and job crafting as the less intense intervention group, completed the Michigan Job Crafting Exercise, and were invited to participate in each of the three, ‘core’, online questionnaires. Unlike the knowledge-reflection group, however, this exercise was followed with a briefing which explained the Job Crafting Boosts individuals were invited to complete over the four-week intervention period (for details, see below). A target of three Job Crafting Boosts a week was encouraged. Following each Job Crafting Boost achieved, participants were invited to complete a short, online, and mobile friendly Boost evaluation questionnaire. The procedure is depicted in Figure 1.

PLEASE INSERT FIGURE 1 ABOUT HERE

The Job Crafting Boosts

After completing The Michigan Exercise and the first, Time 0 survey, Job Crafting

Boosts were presented to participants in the knowledge-reflection-action intervention in the form of a list from which individuals could choose (see Supplementary Material pp.2-4).

Participants received this list both as a hard copy presented in class, and as an electronic copy posted on the course e-learning platform, prior to the four week action component of the intervention. Individuals were encouraged to complete a target of three Boosts a week during the four week 'action' period of the intervention, and were reminded each week to engage in these Boosts by the course tutor. Participants in the less intense, knowledge-reflection, intervention did not receive this list and were not encouraged on a weekly basis to engage in job crafting activities following The Michigan Exercise and first (Time 0) survey (Figure 1).

The Job Crafting Boosts were designed by the researchers. By designing the Boosts ourselves, rather than inviting participants to come up with Boosts or job crafting goals, we ensured that each Boost reflected a specific job crafting behaviour and therefore that the intervention was operationalised appropriately. In addition, providing Boosts reduced the load on already highly loaded participants, and was intended to maximising participation. For more detail about the development of these Boosts, please see the Supplementary Material.

Each Boost consisted of a paired question and activity. Individuals were required to reflect on the question before carrying out the activity. An example of a question-activity combination to increase structural job resources is, 'Are you often busy with multiple things at the same time?' with the Boost activity suggested being, 'Work for 20 minutes on one task only, put your phone away and ignore mail (tip: use an alarm)'. Individuals could choose from 29 activities which tapped each of the four types of job crafting from the JD-R perspective (Tims et al., 2012). Nine activities were focused on increasing job resources, seven on increasing challenging job demands, six on decreasing hindering demands and seven on increasing social job resources (see Supplementary Material, pp. 2-4).

Incentives for Participation in the Interventions

Two key incentives were in place. Firstly, both intervention groups received personalised feedback reports (tailored to their results) by email after the third survey, if all three surveys had been completed. These reports provided individual scores and information about key constructs measured, as well as reflection exercises to facilitate learning. Those in the ‘knowledge-reflection-action’ intervention group also received results and insights relating to the post-Boost evaluation surveys. Secondly, those in the knowledge-reflection-action group were invited to partake in a voluntary competition to win a book voucher to the value of AUD\$50, and a merchandised mug. Together, these two incentives were intended to motivate survey response, increase compliance with the intervention, and reduce dropout.

Measures

The following measures comprised the three core online surveys administered to both intervention groups (for reliabilities, see the diagonal, Table 1). Unless stated otherwise, each measure was assessed at all three time points. A 5-point Likert response scale captured responses (1=Strongly disagree; 5=Strongly agree):

Demographic data. Demographics collected were: name (required to send feedback reports), identification number (required to match data across time-points), gender (1=male; 2=female), age, work status (1= full-time; 2=part-time; 3=not working), industry (e.g. education, financial services, construction), work area (e.g. production, engineering, marketing), and number of people supervised.

All of the four job crafting measures below were originally validated across three separate samples in The Netherlands and demonstrated good structural, convergent, and criterion validity (Tims et al., 2012), suggesting it is an appropriate measure to use.

Increasing structural job resources. Five items from the 21 item Job Crafting Scale developed by Tims et al. (2012) measured this construct. An example is, ‘I try to develop my capabilities’. Reliabilities across the three time points were good ($\alpha=.72-.88$).

Increasing social job resources. Five items from the Job Crafting Scale captured this construct (Tims et al., 2012). An example is, ‘I ask my supervisor to coach me’. Reliabilities were acceptable ($\alpha=.64-.77$).

Increasing challenging job demands. This was measured with five items from the Job Crafting Scale (Tims et al., 2012). An example is, ‘When an interesting project comes along, I offer myself proactively as project co-worker’. Reliabilities were acceptable ($\alpha=.69-.78$).

Decreasing hindering job demands. Six items from the Job Crafting Scale (Tims et al., 2012) measured this construct. An example is, ‘I make sure that my work is mentally less intense’. Reliabilities were good to excellent ($\alpha=.76-.91$).

Workload. Four items tapped perceptions of workload and time pressure, taken from a study investigating psychosocial strain at work (Van Veldhoven & Meijman, 1994). This study provided evidence for the validity of this measure. An example item is, ‘Do you have too much work to do?’. Responses were captured on a 5-point frequency scale (1=Never; 5=Always). Workload was measured at Time 0. The reliability was very good ($\alpha=.84$).

Knowledge-reflection-action Job Crafting Boost Evaluation Questions

To capture the type of Job Crafting Boost completed, participants in the knowledge-reflection-action confirmed which Boost they had completed in the Boost online evaluations. Then four questions were presented, each with a 5-point response scale (1=Not at all; 5=Extremely)². These assessed the motivational states proposed by proactivity theory (Parker et al., 2010) as follows: ‘How challenging was this task for you?’ (‘can do’ motivational state); ‘How enjoyable was this task for you?’ (‘energised to’ state); and ‘How novel was this task for you?’/ ‘How relevant was this task for your work?’ (‘reason to’ motivational states). Each

² These post-Job Crafting Boost evaluation questions were not presented to those in the less intense, knowledge-reflection intervention as they did not have the opportunity to partake in these Boosts. Hence, all analyses involving these questions were constrained to the more intense, knowledge-reflection-action intervention.

item was treated separately in analyses using mean scores. To gain a deeper insight into how participants found each activity, the additional open text question was presented, ‘What was your key takeaway from completing this task?’.

Statistical Analyses

Descriptive analyses were conducted in SPSS (v26) and between-groups oneway analysis of variance (ANOVA) were used to check for Time 0 differences on demographic and research variables. Only participants who were working (full or part time) were included in the analyses. Longitudinal growth modelling (LGCM) in *Mplus* (v8.1) was used to test whether the effectiveness of the intervention for increasing job crafting behaviours varied according to individuals’ workload and/or between intervention groups. We tested for both linear and quadratic effects. The robust full information maximum likelihood (MLR) estimator in *MPlus* was used to run the analyses and is also able to impute missing data and remain robust to non-normality. This meant that, despite non-responses, we were able to use the data from the whole sample and thus increase statistical power beyond that possible using SPSS, which deletes data listwise by default before conducting analyses.

We approached our longitudinal analyses in four steps, as recommended by Byrne (2012). The first step involves assessing whether there is change in job crafting behaviours over time in the whole sample (i.e., when considering both intervention groups together as a single, pooled sample) with no moderators are in the model. If change is observed, exploring the reasons for these changes by adding moderators is warranted. For each type of job crafting behaviour, we therefore first fitted a model involving each behaviour at each time point without adding a moderator (i.e., ‘the null model’). The second model specified allowed variance in the intercept but retained a zero slope, meaning that intra-individual differences in the level of the job crafting behaviour at Time 0 could be tested (i.e., ‘the intercept variance, no slope model’). The third model involved fixing the slope, and allowing intercept variance,

enabling change over the measurement period to be tested (i.e., ‘the intercept variance, fixed slope model’). The fourth model allowed variance in the intercept and slope, to test whether there was intra-individual variation in the extent of change as well as the initial level of the job crafting behaviour (i.e., ‘the intercept variance, slope variance model’).

The second step involves assessing whether differences in perceptions of crafting behaviours over time could be explained by workload. We added the moderator, workload, to each of the ‘intercept variance, slope variance’ models established in the preceding step and tested for a significant difference in job crafting behaviours according to initial workload. The third step first involves removing workload and adding the moderator, intervention intensity, to all of our models. The fourth step involves testing for an interaction effect between workload and intervention intensity.

The fit of each subsequent model in our analyses was compared to the fit of the previous model, to assess which model was best fitting overall. Standard fit indices were used (Byrne, 2012): the comparative fit index (CFI); the root mean square error of approximation (RMSEA); and the standardised root mean square residual (SRMR). Values above .90 for the CFI, and below 0.06 for the RMSEA and SRMR were interpreted as indicating good fit (Byrne, 2012). The chi-square difference test was also used to assess whether there was a significant improvement in fit between nested models.

Qualitative Analyses of Participant Experiences

Conventional content analysis (Hsieh & Shannon, 2005) was adopted to evaluate participant experiences in the knowledge-reflection-action intervention. This approach is suited to describing a phenomenon - such as participant experiences - particularly when previous research on the topic is limited, as in this case (Hsieh & Shannon, 2005). The method involved coding the key ‘takeaways’, or comments, which participants expressed as part of the evaluation questions line by line according to the themes which came up. This was

an inductive process conducted by the first author, with initial themes being created and when a new code was considered necessary in order to capture a new idea. The categories were not mutually exclusive, so it was possible to code a comment into more than one category. Once all of the comments had been coded into initial themes, higher order themes were created, by identifying which themes fitted together and grouping them under umbrella terms.

Results

Descriptives

Seven people who were not working were removed from the dataset. Two further people were removed whose data was mostly missing. Following this, at Time 0, 90 people completed the questionnaire (88% response rate). At Time 1, 67 people responded (66% response rate), and at Time 2, 59 people responded (58% response rate). The final matched sample comprised 89 participants³ (39 knowledge-reflection-action intervention participants and 50 reflection intervention participants). Please see Figure A in our supplementary material for full attrition details between surveys for each group. Table 1 presents the means (*M*), standard deviations (*SD*), correlations, and reliabilities for all our study variables at Time 0 as well as at Time 1 and 2.

INSERT TABLE 1 ABOUT HERE

LGCM results

Step 1. Assessing Whether Perceptions of Job Crafting Behaviours Changed Over Time

LGCM was used to test whether the interventions were effective for increasing job crafting behaviours over time in the whole, pooled sample (N=89). Our results revealed that,

³The matched sample size in the MPlus analyses was maximised (N=89) due to implementation of Full Information Maximum Likelihood (FIML) estimation whereas in SPSS analyses, listwise deletion was employed, hence the matched sample was lower (N=58).

on average, there were intra-individual differences in the perceptions of all four job crafting behaviours at Time 0. This was indicated by significant intercepts (Models A1, B1, C1 & D1, Table 2). Further, change in perceptions of a crafting behaviour over time was observed for decreasing hindering demands, indicated by a significant slope. Additionally, intra-individual covariation between initial levels of the crafting behaviour and the rate of change over time were observed for three of the models, indicated by significant intercept-slope covariances (increasing structural job resources, $p < .01$; increasing social resources, $p = .02$; increasing challenging job demands, $p = .01$). Results also indicated that the ‘intercept variance, slope variance’ models for each of the four types of crafting behaviours demonstrated good fit (see Table 2a, models A1, B1, C1 & D1). In sum, our results suggest differences over time in perceptions of all job crafting behaviours. This indicates the presence of moderators, hence we proceeded to Step 2.

Step 2. Testing for Differences in Perceptions of Job Crafting Behaviours Over Time According to Initial (Time 0) Levels of Workload

We added Time 0 workload to our model and found that those with a higher workload at Time 0 (by, on average, 0.13 points on the 5-point response scale) engaged in more behaviours to increase structural job resources at Time 0. Those with a higher initial workload engaged in fewer behaviours to increase structural job resources over time than those with a lower workload. That is, between each time point, those who started with higher workloads reported a significant reduction in behaviours to increase structural job resources by -0.19 points on the 5 point response scale. The slope (time) explained considerable variance in this model (33%), whereas the intercept (Time 0 workload mean) explained a small amount of variance (8%). Figure 2 depicts this model (see also Table 2b, A2).

We did not find any significant differences in perceptions of behaviours to increase social job resources or challenging job demands according to Time 0 workload levels. We did

find a significant intercept and slope when Time 0 workload was added as a moderator in the model with perceptions of behaviours to decrease hindering demands (Figure 3, see also D2, Table 2b). This suggests that those with a lower initial workload than the mean engaged in fewer behaviours at Time 0 to decrease hindering demands (by -0.19 points on the 5-point response scale) than those with a higher initial workload (Figure 5). However, those with a higher initial workload carried out more behaviours to decrease hindering demands between each time point (by 0.10 points on the 5-point response scale) than those with a lower initial workload (Figure 5). We note that those with a lower workload initially also increased the amount of behaviours to reduce hindering demands over time, but the rate of change was slower. For example, when workload at Time 0 was one *SD* below the mean, predicted levels of perceived behaviours to reduce hindering demands increased at a slower rate over time than when Time 0 workload was 1 *SD* above the mean (Figure 5). The slope (time) explained a moderate amount of variance in this model (17%), whereas the intercept (Time 0 workload mean) explained a small amount of variance (7%). We also tested for quadratic relationships between job crafting behaviours and workload over time but we found no significant relationships. Overall, these findings provide support for hypotheses 1 and 2.

Step 3. Testing for Differences in Perceptions of Job Crafting Behaviours Over Time

According to Intervention Group

We found no significant differences in effectiveness between the two interventions on any of the four types of job crafting behaviours across time when the moderator, intervention group, was added to each of the ‘intercept variance, slope variance’ models (Table 2, models A3, B3, C3 & D3). We also checked for quadratic relationships but found none for any of the job crafting behaviours when intervention group was in the models. Overall, these results suggest linear relationships between variables, and no differences in effectiveness according to intervention intensity on any of the four types of job crafting behaviours over time, as

crafting trajectories over time (indicated by the slope results) were not significant. We proceeded to test for an interaction effect between workload and intervention group, as an interaction effect could still exist in the absence of a main effect of intervention group.

Step 4. Testing for an Interaction Effect Between Workload and Intervention Group on Perceptions of Job Crafting Behaviours Over Time

We tested for an interaction effect between workload and intervention intensity over time in order to determine whether there was a significant difference in job crafting behaviours across time according to workload and the intervention intensity such that, for example, the knowledge-reflection-action intervention was more effective than the knowledge-reflection intervention for decreasing hindering demands over time. No interaction effect was observed when any of the job crafting behaviours were entered as the dependent variables (reducing hindering demand behaviours, $\beta=.08$, $SD=.12$, $p=.85$; increasing structural job resources, $\beta=-.04$, $SD=.08$, $p=.62$; increasing challenging job demands, $\beta=-.03$, $SD=.09$, $p=.75$, increasing social job resources, $\beta=-.07$, $SD=.10$, $p=.45$). Hypotheses 3 and 4 were not supported.

In sum, Hypothesis 1 was supported as those with a higher initial workload reported an increase in perceptions of job crafting behaviours to decrease hindering demands. Hypothesis 2 was partially supported as those with a lower initial workload reported increasing crafting behaviours to improve structural job resources, but there was no difference in behaviours to increase social job resources or challenging job demands according to workload. Hypotheses 3 and 4 were not supported as there were no significant interaction effects between workload and intervention intensity on perceptions of decreasing hindering demands or increasing structural resources and challenging job demands over time.

INSERT TABLES 2a & 2b HERE

INSERT FIGURES 2, 3, 4 & 5 HERE

Participation in the Knowledge-Reflection-Action Intervention

Twenty-nine participants (57%) who were part of the knowledge-reflection-action intervention carried out between one and 21 Job Crafting Boosts in the four-week action period of the intervention. In contrast to expectations, the high workload group completed a total average of 9.18 ($SD=7.04$) Job Crafting Boosts, and the low workload group completed a total average of 7.67 ($SD=5.89$) Boosts (see Table A, Supplementary Material). This does not support Hypothesis 5. Further, these averages are below the target of 12 for the entire period. Twenty-one people, who were also part of the action-reflection intervention (43%), carried out zero Boosts. These results suggest high variability in the number of Boosts completed, and that the knowledge-reflection-action intervention was only well implemented by a few individuals. This is likely to have impacted intervention success, and might explain why there were few differences between the low and high intensity interventions.

Amongst those who had actually completed Boosts ($N=29$), the high workload group completed, on average, more Boosts to reduce hindering demands than those in the low workload group (Mean=2.73 vs 1.83, respectively), supporting Hypothesis 6. The low workload group also completed, on average, more structural job resource building Boosts than those in the high workload group (Mean=3.28 vs 3.09 activities, respectively), as well as more Boosts to increase challenging job demands (Mean=1.64 vs 1.33 activities). Those in the low workload group did not complete more Boosts to increase social job resources, however (Mean=1.22 vs 1.77 activities). These results partially support Hypothesis 7. Additionally, oneway ANOVAs between groups revealed no significant differences in the number and type of each type of Boost completed (Table A, Supplementary Material), however, this may be due to the low sample sizes.

Further, we carried out some additional, exploratory analyses of the Boost evaluation questions. On average, those in the high workload group had a lower mean score than those in the low workload group for each of the post Boost evaluation questions which asked how challenging, energising, and novel the chosen Job Crafting Boost was (2.18, 2.99, 2.37 & 3.71 vs 2.22, 3.21, 2.64 & 3.64, see also Table B, Supplementary Material). In addition, those in the high workload group had a higher score, on average, for how relevant the activity was for their work (3.71 vs 3.64). Oneway ANOVAs revealed no significant differences between groups in terms of these results, but this may again be due to low statistical power.

Knowledge-Reflection-Action Intervention Participant Experiences

Through content analysis (Hsieh & Shannon, 2005), we identified nine final themes which are described in Table C (Supplementary material), along with example 1) positive comments; 2) negative comments; 3) raised awareness / insight; 4) intention to do something different in the future; 5) vigour and motivation; 6) improved outcomes; 7) development and training; 8) helping others; and 9) improved relationships and communication. Almost all the comments were positive, whether or not the individual was in the high or low workload group (mean number of comments=5.89 vs 6.18 respectively; see Table C, Supplementary Material). Individuals in the high workload group reported, on average, more comments than the low workload group with respect to each of the themes except ‘development and training’ and ‘improved relationships and communication’. For these latter two themes, both groups reported the same number of comments (3 & 4 comments respectively).

Commonly, individuals in both high and low workload groups reported how a particular Boost raised their awareness about particular distractions at work and how they could manage them. This was particularly true of the high workload group (66 comments vs 48) and sometimes led to intentions to make changes to the way they carried out certain work activities in the future, such as by actively planning ahead or planning questions in advance

of meetings to gain more value from them. Another major theme was ‘vigour and motivation’, with the high workload group reporting 22 comments and the low workload group 19 comments. Individuals frequently stated that a Boost had made them feel ‘good’ or ‘energised’, particularly after helping a colleague. Several people noted the benefits of the Boosts for personal and organisational outcomes (16 comments vs 14 comments for high / low workload groups respectively), highlighting, for example, how turning off email notifications improved productivity, or problem-solving as a team led to solutions which would improve team efficiency. Fewer comments surrounded improved relationships and communication with others (8 vs 4 comments), which may reflect the lower numbers of Boosts to increase social job resources which were completed.

Two individuals made six comments which were more negative in nature. During a Boost to focus on a single work task for 20 minutes after removing distractions, one individual reported that they ‘did not enjoy at all’ the work task carried out, and another reported a work task that was ‘highly unstimulating’. In response to another Boost to brainstorm with colleagues how to make a work task more enjoyable, another individual responded that ‘there are a lot of tasks in my job which I don’t like, however, they are unavoidable and most are mundane’. Most of the comments related to work which was unstimulating or unenjoyable. This may reflect a lack of fit between these individuals’ needs, goals, and skills, and their jobs, which was not surmountable through job crafting.

Taken together, these results suggest that those who actually completed Boosts nearly always found the experience positive and beneficial, whether they were in the high or low workload group. The low number of negative comments supports this view.

Discussion

Due to the growing knowledge about the importance of job crafting for employee well-being and performance, interest in job crafting interventions has grown. However, job

crafting interventions have shown different results with regard to their successfulness in increasing job crafting behaviours. These inconsistent findings warranted the examination of factors that may elucidate under which conditions job crafting interventions work best. In this study, we drew on COR theory and proactivity theory to understand the impact of workload, intervention intensity, and participation, on the effectiveness of a less intense, knowledge-reflection, intervention, and a more intense, knowledge-reflection-action, intervention, on subsequent job crafting behaviours. As proactive crafting requires initial resources, we theorised that those under high workload would not have the resources to self-initiate crafting behaviours to increase job or social resources, but would instead invest in protecting and managing current resources by increasing behaviours to reduce demands. Further, we assessed participation and participant experiences in the knowledge-reflection-action intervention to unpack the conditions under which interventions are successful. To our knowledge, no other job crafting intervention study has sought to understand these aspects, but they may provide important information about the design of such interventions.

The Moderating Role of Workload

Consistent with theory, our pooled sample (including both the knowledge-reflection and the knowledge-reflection-action intervention groups) revealed that those with a high workload at Time 0 significantly increased job crafting behaviours to decrease hindering demands following the interventions, and those with a low workload significantly increased behaviours to increase structural job resources. There was no change in behaviours to increase challenging job demands or social job resources following the job crafting interventions. Results of participants' engagement in the intervention provided more insight, as those in the high workload group reported completing, on average, fewer crafting activities to increase social resources, and more activities to reduce hindering job demands, than those in the low workload group. In contrast, those in the low workload group reported engaging in

more behaviours to increase structural job resources and challenging job demands compared to those with a high initial workload. Participants with both high and low workloads reported positive experiences from taking part in Boosts, suggesting that job crafting can be motivational no matter the level of workload, if directed towards appropriate activities. For example, those with high workloads could focus on managing that workload whereas those with lower workloads could focus on building job resources.

These findings related to engagement can be explained in terms of COR (Hobfoll, 1989) theory. When participants felt overloaded with job activities and responsibilities, they did not have the resources to engage in further activities which could potentially increase workload, such as seeking new opportunities or training. Instead, they took action to protect and manage their current resources by carrying out activities to reduce hindering demands. For example, several participants reported that by switching off phones and email, even for a short while, concentration improved and work goals were achieved more efficiently. Conversely, when workload was lower, individuals had the capacity to work towards increasing their job resources. This concurs with JD-R theory which proposes that optimal outcomes are achieved when job resources are high and demands are moderate (Bakker & Demerouti, 2007). Our findings also support Van Wingerden and colleagues' (2013) qualitative study, which found a decrease in demands following an intervention in which overloaded teachers reported completing activities primarily aimed at reducing demands. The results of Van Wingerden et al. (2017a) are also in line with our findings as behaviours to reduce hindering demands increased following their intervention. It is possible that those with a higher workload may have engaged in even more such behaviours than those with a low workload, however, this analysis was not conducted in their study.

Conversely, in their meta-analysis, Rudolph et al. (2017) found the opposite effects to those predicted by proactivity and JD-R theory. That is, they found that workload correlated

positively with job crafting behaviours to increase job resources and challenging demands and was not correlated with behaviours to decrease hindering job demands. They postulated that this finding occurred because behaviours directed at decreasing hindering demands are maladaptive, indicating withdrawal from work, while behaviours focused on increasing job resources and challenging demands indicate engagement in work. Thus, even when workload is high, Rudolph et al. (2017) suggested that engaged individuals will choose to direct attention towards increasing job resources and challenging job demands. This meta-analysis involved several different study designs, however, not just intervention studies, so causality cannot be ascertained. An alternative explanation for Rudolph and colleagues' findings could be that those low in workload may have already lowered their hindering demands by crafting. Without measuring crafting behaviours over time, it is impossible to say whether low workload preceded crafting to reduce hindering demands or vice versa.

Our results also revealed that workload did not appear to affect crafting behaviours to increase social job resources or challenging job demands. Individuals reported carrying out fewer activities of these types than activities to increase structural job resources or reduce hindering demands. A possible explanation of this finding is that individuals were satisfied with the amount of social job resources and challenging job demands already in their jobs, or perceived greater benefit from investing in other types of job crafting behaviours, as indicated by their choice of specific Boosts. For example, the MBA course already involved intensive cohort networking, potentially reducing individuals' desire to increase social resources. Likewise, completing an MBA on top of a day job is already challenging, reducing energy available for increasing challenging job resources. Activities which did not require coordination with others, or challenging oneself unnecessarily, may have been considered 'easier' to complete. The generalisability of these results needs to be explored.

The motivational states tapped by the online evaluation questions in our study can

further help to explain how workload moderates the effect on job crafting behaviours. The high workload group appeared to be more motivated by how relevant the activity was for their work as the mean for this group was higher than the mean for the low workload group. This fits the context as more behaviours to decrease hindering demands were completed by the high workload group. These participants were therefore arguably more motivated to complete activities which were directly relevant to decreasing hindering behaviours than the low workload group. This is supported by our qualitative findings, in which we found that participants with high initial workloads gained awareness of work distractions and how to reduce them. As Rudolph et al. (2017) suggested, behaviours to decrease hindrance demands may be considered less motivational and challenging than other types of crafting, leading to lower scores on the evaluation questions.

On the other hand, the low workload group appeared more motivated to complete activities which were challenging, tapping the 'can do' motivational state. A lower workload presumably allowed these individuals the capacity to build resources as opposed to protecting their current resources and managing demands. In keeping with JD-R theory (Bakker & Demerouti, 2007), building resources may have stimulated these participants' engagement in their jobs and motivated them to further seek opportunities to create resources, enabling sustained motivation. It is possible that, depending on dynamic changes in workload on a daily or weekly basis, individuals could switch between motivational states, resulting in changes in the type of crafting adopted. These results were supported by fewer qualitative comments on vigour and motivation from those with high initial workloads. Taken together, our findings provide empirical support that the effectiveness of job crafting interventions is dependent on participant workload.

The Moderating Role of Intervention Intensity

A moderator effect of intervention intensity was not found, which at first may seem to

favour the less intense intervention. However, findings from the degree of participation in the knowledge-reflection-action intervention help to place this finding into perspective: less than 60% of participants carried out job crafting activities in the knowledge-reflection-action intervention, with a few participants completing a large number of Job Crafting Boosts, most participants completing some, and many completing none. Thus, it may be that the intensity of the intervention was not as high as initially expected because few of the participants complied with the intervention or achieved the target of three Boosts per week. Future intervention studies should thus assess participant engagement in the intervention.

Another potential explanation for this finding may relate to the nature of our sample. Professionals and managers who are motivated to undertake an MBA, and further motivated to voluntarily participate in an intervention as part of a self-elected module aimed at developing management skills, are likely to be highly proactive people. Thus, even those in the less intense intervention, who learned about job crafting and completed the Michigan Job Crafting exercise (minus the job crafting plan), may have been motivated to carry out job crafting activities at work. In addition, across both interventions, initial levels of job crafting behaviours were quite high, which indicated that participants were already carrying out activities akin to job crafting. A ceiling effect may have resulted, making it difficult to detect significant increases in job crafting behaviours and differences between groups. It is also possible that those in the knowledge-reflection intervention were intrinsically motivated to carry out job crafting following the Michigan exercise, even though they were not requested to do so. Inadvertently, and in contrast, the participant incentives associated with the Boosts in the knowledge-reflection-action intervention may have only generated 'extrinsic' motivation rather than the internalized motivation that Parker et al. (2010) propose is especially important for proactivity. This could explain why we did not observe significant differences in effect between the interventions. We also cannot rule out the possibility that

our analyses were statistically underpowered due to small sample sizes in each group.

Participation in the Intervention and Participant Experiences

As noted above, the limited participation in the intervention is likely to have impacted the ability to observe differences in effect between interventions. The demands of working full-time, studying for a part-time MBA, and family commitments, could have impeded participation. In essence, the action component could have been seen by some as an additional demand rather than as a proactive means of managing those demands. At the same time, we noted that those who did participate in the knowledge-reflection-action intervention, and were experiencing high initial workloads, engaged in more Job Crafting Boosts on average than those with low workloads (although this difference was not statistically significant). These individuals could be particularly proactive and conscientious, keen to optimise their work and thus more engaged in the intervention. Rudolph et al. (2017) observed a strong positive correlation between proactive personality and job crafting behaviours ($r=.47$), and a moderate correlation between conscientiousness and job crafting behaviours ($r=.15$) suggesting that these personality traits indeed might predict who is likely to participate in intense interventions. Future intervention research could explore these ideas further so as to increase knowledge about how to effectively target crafting interventions.

Further, the overwhelmingly positive responses to the open text evaluation question suggests that those that did take part perceived the intervention as beneficial. This is important for two reasons. First, it suggests that interventions can be beneficial for those that take part, even if participation is low and statistical results are limited. This concurs with other intervention studies in related fields which have found qualitative evidence of effectiveness despite lacking statistical evidence (e.g., Knight, Patterson, Dawson & Brown, 2017). Therefore, there is value in organisations offering such interventions, especially as doing so would be likely to be inexpensive given the voluntary nature of this type of bottom-

up intervention. Secondly, these qualitative results highlight the need to go beyond statistical evaluations of interventions to incorporate qualitative evaluations that analyse how well intervention plans were adhered to, as repeatedly called for in the literature (e.g., Briner & Walshe, 2015; Nielsen et al., 2010). In our study, the positive qualitative comments support the possibility that variable participation rates and low statistical power prevented statistically significant effects.

Implications for research and practice

This study makes three key contributions to research. Firstly, we identify that job crafting interventions have differential effects depending on individuals' initial workload level. Activities to reduce hindering demands could be targeted at those with high initial workloads, while activities to increase job resources and challenging job demands could be targeted at those with more manageable initial workloads. This is likely to have an impact on health, well-being and performance in both cases, as those with high workloads gain control over their work, and those with lower workloads gain work motivation. This supports JD-R theory, which highlights the positive relationships between job resources, moderate demands, work engagement and performance. Secondly, it is not yet clear whether a less intense, knowledge-reflection job crafting intervention is just as effective as a more intense intervention incorporating a structured action component. Our results suggest that it is, but this could be due to lack of participation in the knowledge-reflection-action intervention. To encourage greater participation, further research could investigate whether reminders help participants to carry out job crafting activities, or could ask participants themselves what would motivate them to job craft. Alternatively, the lack of statistical differences between groups may suggest it is sufficient to educate employees about the benefits of good work design and how it can be achieved through job crafting, and then to provide the opportunity for employees to analyse their own jobs and identify aspects to change. Following this

process, individuals may naturally engage in job crafting in order to increase person-job fit. Thirdly, we note the importance of measuring participation and participation experiences in the intervention. The overwhelming majority of participants who actively participated in the knowledge-reflection-action intervention reported positive experiences. This supports the view that implementation evaluations are important for contextualising statistical results and preventing erroneous conclusions (Briner & Walshe, 2015; Nielsen & Randall, 2013).

Two key contributions to practice are also evident. Firstly, managers and practitioners could target particular individuals based on initial levels of workload, which could be identified in a pre-assessment. Job crafting activities which are most appropriate for the target group could be emphasised, such as encouraging activities to decrease hindering demands in a high workload group. This could improve the effectiveness of the intervention and other types of job crafting activities could be gradually introduced as the balance between job demands and resources improved. Secondly, intervention designs could focus on job analysis and reflection, with less focus on actually directing people to carry out specific activities. Though it is not clear whether a knowledge-reflection-action intervention with high participation rates would prove more effective than a knowledge-reflection intervention, it may be practically easier for organisations and managers to promote a reflection-focused approach and allow individuals to explore opportunities for job crafting themselves.

Limitations and directions for future research

The strengths of our study lie in our analysis of different conditions which may impact the effectiveness of job crafting interventions and which have not previously been investigated, namely, workload levels, intervention intensity, and participation and participant experiences of engaging in the knowledge-reflection-action intervention. Several limitations should be noted. The sample size was small, which may have limited the ability to detect effects, even though we maximised statistical power for our moderator analyses by

pooling the sample. Participation in the action component was limited, preventing stronger conclusions around the effectiveness of one intervention over another. Further, we were aware that our participants were under pressure from competing course, work, and family demands which may have hindered participation. Nevertheless, the response rates to the three core surveys were good, reducing the likelihood of biased results due to attrition.

We suggest four key avenues for future research. Firstly, future studies could focus on other moderators besides workload. For example, it is plausible that differences in initial levels of autonomy will impact the ability of individuals to carry out job crafting. Initial levels of social support may also impact how likely it is that individuals will choose activities to increase social job resources. The impact of other work characteristics which are likely to be most relevant, such as social support and autonomy, could also be explored. Beyond work characteristics, other moderators are likely to include proactive personality which research indicates are highly associated with proactive behaviour (Parker et al., 2010; Rudolph et al., 2017). Secondly, adopting an integrated perspective of job crafting, such as that proposed by Zhang and Parker (2019), and additionally exploring the impact of an intervention on other types of crafting, such as relational or cognitive crafting, could help move job crafting intervention literature forward.

Thirdly, future studies could explore the mechanisms underlying job crafting interventions, such as the motivational states espoused by proactivity theory (Parker et al., 2010). This would help substantiate our view that motivational states were key in explaining why workload moderated our intervention and led to differential impact on crafting behaviours. To encourage and improve participation, further research could also investigate whether regular reminders would help participants remember to carry out job crafting activities, or ask participants themselves what would motivate them to job craft. Such research could have implications for designing and tailoring interventions for specific target

groups. Fourthly, the type of job crafting intervention described here would incur little cost to organisations and the productivity benefits could far outweigh the cost of training. We were not able to assess the cost-effectiveness of our intervention but suggest that an important avenue for future research would be in evaluating the cost of implementing interventions against the expected increase in well-being and performance. Other modes of delivering training, such as online, could also be trialled, with the potential advantage of reducing upfront costs (e.g., from employing a trainer or lost productivity during training attendance), and increasing participation due to increased flexibility around completion time and place.

Conclusion

There is strong theory to suggest that job crafting interventions should be effective for increasing job crafting behaviours, yet individual intervention studies reveal mixed results and have investigated a limited number of moderators. Our study goes some way to unpacking the conditions under which job crafting interventions may be effective. Our results suggest that job crafting interventions should be targeted appropriately, with interventions which focus on building job resources directed towards those low in initial workload, and interventions which focus on reducing hindering demands directed towards those high in initial workload. Further, our results suggest that interventions may not need to be intense in terms of the number of specified job crafting activities (Boosts) that individuals are expected to complete, in order to be effective. This is important, as more people may be encouraged to take part in interventions which are less demanding. These results also suggest that job crafting education coupled with job analysis of one's own job may be the most important intervention ingredients for success and should be a key part of future interventions. We hope our study helps to move job crafting intervention conversations forward around what works for whom and under what circumstances.

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Table 1

Means, standard deviations, bivariate correlations, and cronbach's alpha (in the diagonal) for each focal variable at each of the three time points

Variable	Mean	SD	N	1	2	3	4	5	6	7	8	9	10
1. Gender	1.34	0.48	86										
2. Age	37.28	6.57	89	.05									
3. Industry	13.43	7.81	90	-.19	-.08								
4. Work area	8.81	5.19	90	.23*	.07	-.12							
5. No. supervised	9.51	26.87	88	-.10	-.08	.13	-.36**						
6. Increasing structural resources T0	4.26	0.43	89	.02	.07	-.06	.12	.06	(.74)				
7. Increasing social resources T0	3.30	0.67	89	.08	-.26*	.12	-.07	-.04	.22*	(.72)			
8. Increasing challenging demands T0	3.81	0.56	89	.04	.06	-.11	-.08	.07	.36**	.18	(.69)		
9. Decreasing hindrance demands T0	2.59	0.58	89	.23*	-.13	.17	.05	.11	-.11	.04	-.01	(.76)	
10. Workload T0	3.72	0.67	88	-.03	.11	.04	-.07	.16	.21	.19	.12	-.24*	(.84)
11. Increasing structural resources T1	4.20	0.40	73	.05	.12	-.04	.02	.02	.48**	.08	.31**	-.05	.10
12. Increasing social resources T1	3.32	0.63	73	.17	-.30*	.08	-.16	.11	.16	.76**	.20	.11	.23
13. Increasing challenging demands T1	3.76	0.57	73	-.01	-.07	-.03	-.26	.00	.33**	.16	.61**	.17	.01
14. Decreasing hindrance demands T1	2.80	0.75	73	.33*	-.14	.04	.01	.17	.00	.13	.03	.73**	.00
15. Increasing structural resources T2	4.26	0.47	59	.09	-.03	.14	-.10	.05	.52**	.12	.30*	-.07	.08
16. Increasing social resources T2	3.29	0.70	59	.01	-.27*	.10	-.37	.17	.16	.72**	.27*	.16	.15
17. Increasing challenging demands T2	3.84	0.52	59	.07	-.17	.22	-.17	.04	.33*	.19	.61**	.10	.16

18. Decreasing hindrance demands T2	2.85	0.83	59	.11	-.28*	.03	-.13	.22	-.09	.27*	-.03	.68**	-.06
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Table 1 cont'd

Variable	Mean	SD	N	11	12	13	14	15	16	17	18
11. Increasing structural resources T1	4.20	0.40	73	(.72)							
12. Increasing social resources T1	3.32	0.63	73	.25*	(.64)						
13. Increasing challenging demands T1	3.76	0.57	73	.54**	.36	(.78)					
14. Decreasing hindrance demands T1	2.80	0.75	73	.06	.26*	.17	(.86)				
15. Workload T1	3.61	0.70	73	.17	.31**	.28*	-.04				
16. Increasing structural resources T2	4.26	0.47	59	.59**	.24	.45**	.05	(.88)			
17. Increasing social resources T2	3.29	0.70	59	.19	.83**	.35**	.17	.24	(.77)		
18. Increasing challenging demands T2	3.84	0.52	59	.54**	.42**	.75**	.14	.58**	.36**	(.79)	
19. Decreasing hindrance demands T2	2.85	0.83	59	.08	.28*	.17	.79**	.01	.29*	.16	(.91)

*correlation is significant at the alpha <.01 level; **correlation is significant at the alpha <.001 level;

Categorical variables were coded as follows (only categories either side of the mean are reported here): Gender, 1=male, 2=female; Industry, 13=Human services (e.g. charity, welfare, immigration, aged care), 14=Industry services (e.g. engineering, environment); Work area, 8=Finance/Accounting, 9=Data processing

Note. T0=Time 0 (first survey); T1=Time 1 (second survey); T2=Time 2 (third survey); SD=standard deviation; N=sample size

Table 2a
 Longitudinal Growth Curve Model Fit Results to Test For Moderator Differences in Job Crafting Behaviours Over Time (N=89)

Model	Moderator	χ^2	<i>df</i>	RMSEA	CFI	SRMR
Increasing structural resources						
A1	None	4.28	3	.07	.97	.19
A2	Intervention group	4.62	4	.04	.97	.16
A3	Time 0 workload	4.48	4	.04	.99	.19
Increasing social resources						
B1	None	2.98	3	0	1.00	.08
B2	Intervention group	4.04	4	.01	1.00	.07
B3	Time 0 workload	3.24	4	0	1.00	.07
Increasing challenging job demands						
C1	None	8.26	3	.14	.94	.21
C2	Intervention group	14.60	4	.17	.88	.20
C3	Time 0 workload	10.17	4	.13	.93	.21
Decreasing hindering demands						
D1	None	4.55	3	.08	.99	.08
D2	Intervention group	7.32	4	.10	.97	.08
D3	Time 0 workload	5.93	4	.07	.98	.07

Note. In each model reported above, both the intercept and slope were allowed to vary; each moderator was tested in separate models (i.e. moderators were not introduced together in the same model); χ^2 =Chi-square statistic; *df*=Degrees of freedom associated with the Chi-square statistic; RMSEA=Root Mean Standard Error of Approximation; CFI=Comparative Fit Index; SRMR=Standardised Root Mean Residual

Table 2b

Longitudinal Growth Curve Parameter Results to Test For Moderator Differences in Job Crafting Behaviours Over Time (N=89)

Model	Parameters	Intercept					Slope (Time)				
		<i>M</i>	<i>SD</i>	<i>p</i>	Residual variance	<i>R</i> ²	<i>M</i>	<i>SD</i>	<i>p</i>	Residual variance	<i>R</i> ²
Increasing structural job resources											
A1	Intercept	4.24	.04	<.01	.09	n/a	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	<-.01	.03	.81	.01	n/a
A2	Intercept	3.75	.24	0	.09	.08	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	.3	.16	.06	.64	.33
	Time 0 workload	.13	.06	.04	n/a	.08	-.08	.04	.05	n/a	.33
A3	Intercept	4.26	.07	0	.09	<.01	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	-.05	.04	.24	<.01	.13
	Intervention group	-.02	.09	.8	n/a	<.01	.07	.06	.19	n/a	.13
Increasing social resources											
B1	Intercept	3.3	.07	<.01	.35	n/a	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	.02	.03	.47	.03	n/a
B2	Intercept	2.57	.38	0	.33	.05	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	.12	.18	.5	.03	.01
	Time 0 workload	.19	.1	.06	n/a	.05	-.03	.05	.59	n/a	.01
B3	Intercept	3.29	.11	0	.35	0	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	<-.01	.05	.96	.03	.02
	Intervention group	.02	.14	.90	n/a	<.01	.04	.06	.52	n/a	.02
Increasing challenging job demands											
C1	Intercept	3.8	.06	<.01	.2	n/a	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	<.01	.03	.76	<.01	n/a

C2	Intercept	3.53	.32	0	.2	.01	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	.16	.17	.35	<.01	.12
	Time 0 workload	.07	.09	.39	n/a	.01	<-.04	.05	.37	n/a	.12
C3	Intercept	3.82	.09	0	.2	<.01	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	<-.01	.05	.96	<.01	.01
	Intervention group	-.04	.12	.73	n/a	<.01	.02	.06	.75	n/a	.01
Decreasing hindering demands											
D1	Intercept	2.61	.06	<.01	.24	n/a	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	.13	.04	<.01	.03	n/a
D2	Intercept	3.3	.35	<.01	.22	n/a	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	-.26	.02	<.01	.02	n/a
	Time 0 workload	-.19	.09	.04	n/a	.07	.11	.06	.05	n/a	.17
D3	Intercept	2.53	.06	.07	.4	.02	n/a	n/a	n/a	n/a	n/a
	Slope (Time)	n/a	n/a	n/a	n/a	n/a	.12	.06	.07	.03	.02
	Intervention group	.14	.13	.28	n/a	.02	.04	.08	.58	n/a	.02

Note. In each model reported above, both the intercept and slope were allowed to vary; each moderator was tested in separate models (i.e. moderators were not introduced together in the same model); *M*=mean; *SD*=standard deviation; *R*²=R-square; *p*=significance value at the alpha <0.05 level

Figure 1: Timeline and procedure for both the knowledge-reflection and knowledge-reflection-action interventions.

Figure 2

Model Displaying the Relationship Between the Moderator, Time 0 Workload, and Perceptions of Increasing Structural Job Resources Over Time. *Note.* Factor loadings, and coefficients and associated *p*-values are displayed; ISTR=Increasing structural resources; T0=Time 0 (first survey); T1=Time 1 (second survey); T2=Time 2 (third survey); e=model error; ns=non-significant at the $\alpha < .05$ level

Figure 3

Line Graph of Predicted Values of the Job Crafting Behaviour, 'Increasing Structural Resources' (ISTR) Over the Three Time Points of the Intervention for Different Values of Time 0 Workload (mean, ± 1 SD)

Figure 4

Model Displaying the Relationship Between the Moderator, Time 0 Workload, and Perceptions of Decreasing Hinderling Demands Over Time. *Note.* Factor loadings, coefficients and associated *p*-values are displayed; ISTR=Increasing structural resources; T0=Time 0 (first survey); T1=Time 1 (second survey); T2=Time 2 (third survey); e=model error

Figure 5

Line Graph of Predicted Values of the Job Crafting Behaviour, 'Decreasing Hinderling Demands' (DHD) Over the Three Time Points of the Intervention for Different Values of Time 0 Workload (Mean, ± 1 SD)