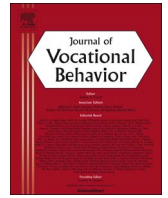


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Individual job redesign: Job crafting interventions in healthcare



Heather J. Gordon^{a,*}, Evangelia Demerouti^a, Pascale M. Le Blanc^a,
Arnold B. Bakker^{b,e}, Tanja Bipp^{c,f}, Marc A.M.T. Verhagen^d

^a Eindhoven University of Technology, The Netherlands^b Erasmus University Rotterdam, The Netherlands^c Open University of The Netherlands, The Netherlands^d Diakonessen Hospital Utrecht, The Netherlands^e Lingnan University, Hong Kong, China^f Julius Maximilian University of Würzburg, Germany

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ABSTRACT

In two quasi-experimental studies – Study 1 among medical specialists ($N = 119$) and Study 2 among nurses ($N = 58$) – we tested the impact of a general and a specific job crafting intervention on health care professionals' well-being and (objective and subjective) job performance. Both groups of participants received training and then set personal job crafting goals for a period of three weeks. The results of a series of repeated measures analyses showed that both interventions were successful. Participation in the job crafting intervention groups were associated with increases in job crafting behaviors, well-being (i.e., work engagement, health, and reduced exhaustion), and job performance (i.e., adaptive, task, and contextual performance) for the medical specialists and nurses relative to the control groups. Though we did not find a significant intervention effect for objective performance, we conclude that job crafting is a promising job redesign intervention strategy that individual employees can use to improve their well-being and job performance.

1. Introduction

The vast majority of job redesign studies have followed a “top-down” approach, in which management optimizes job demands and resources to obtain successful organizational outcomes (Briner & Reynolds, 1999; Nielsen, 2013). However, as work shifts from a manufacturing economy towards a knowledge and service economy, job redesign approaches that consider individuals as active creators of their job become increasingly important for intervention success (Grant & Parker, 2009; Nielsen, Randall, Holten, & Rial-Gonzales, 2010). By emphasizing individuals' reflective collaboration and the influence of both the participants and management on the change process, such approaches offer individuals more job control and utilize their knowledge as the experts (Dollard, Le Blanc, & Cotton, 2008). Further, these interventions take into account individuals' active adjustments to their work environment (Nielsen, 2013) as a way to improve employee health and well-being (Le Blanc, Hox, Schaufeli, Taris, & Peeters, 2007), as well as organizational outcomes, such as job performance (Tims, Bakker, & Derks, 2015).

Individual and organizational interests with regard to job design can be integrated by adopting the theoretical framework of the “job demands-resources model” (JDR; Bakker & Demerouti, 2014, 2017). The model forms the basis on how individuals can

* Corresponding author at: Dept. Industrial Engineering and Innovation Sciences, Human Performance Management Group, Eindhoven University of Technology, Den Dolech 2, 5612 AZ Eindhoven, The Netherlands.

E-mail address: gordonhj@gmail.com (H.J. Gordon).

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proactively “fit” their work environment to their personal skills, needs, and abilities as it stresses the role of individuals in adjusting their job demands and job resources (Tims, Bakker, & Derks, 2012). Little is known about interventions in which individual employees positively and proactively optimize their work environment (Hornung, Rousseau, Glaser, Angerer, & Weigl, 2010). Teaching employees how to adapt to job demands and resources can have a positive impact on their work-related well-being, motivation, and performance, by preparing them to face future job challenges with more control (Seligman, Steen, Park, & Peterson, 2005). Although contextual factors keep changing, individuals may gain some control by proactively influencing their job characteristics.

Wrzesniewski and Dutton (2001) originally defined “job crafting” as the adjustments employees make in their task, relational, or cognitive boundaries of their work. Other researchers view job crafting as the job (re)design strategy aimed at optimizing job demands and resources that may increase work engagement and work meaning (Demerouti & Bakker, 2014; Tims & Bakker, 2010). Job crafting gives individuals control in changing their work environment because it enables individuals to “fit” the job to their needs and preferences by seeking resources, seeking (challenging) demands, and reducing (hindering) demands on a daily basis (Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012; Tims & Bakker, 2010). Also in healthcare, there is a growing awareness that recognizes the need for health care professionals to take a proactive role in shaping their future jobs to improve healthcare systems (Gordon, Demerouti, Le Blanc, & Bipp, 2015).

The central aim of the present research is to investigate the impact of two tailored job crafting interventions in healthcare among medical specialists and nurses, who are trained to optimize and adjust their job demands and resources for personal “fit” and organizational benefits. Our assumption is that such interventions can improve employee well-being and job performance over time because job crafting can increase challenging job demands or job resources, which help employees to achieve their work goals (Demerouti, 2014). By extending the job redesign literature with the inclusion of job crafting, framed within the JD-R theory, we aim to make two major contributions to the literature.

First, we extend research on interventions in organizations as previous research has offered only scarce evidence for the effectiveness of various interventions, mainly with regards to job redesign (Briner & Reynolds, 1999; Holman & Axtell, 2016), and positive organizational behavior (Meyers, van Woerkom, & Bakker, 2013). The impact of job crafting interventions is largely unknown. While Berg, Dutton, and Wrzesniewski (2008) have developed a job crafting exercise, Van den Heuvel, Demerouti, and Peeters (2015) have tested a job crafting intervention and found minor effects on job resources and affect. By designing interventions that allow workers more individual control over the specific demands and resources within their work environment, we suggest that these changes can simultaneously improve workers' subjective health and well-being, and subjective and objective performance. Our research also extends on job redesign theory by adding a “thinking-in-action approach” (Benner, Hooper Kyriakidis, & Stannard, 2011) with experiential learning narratives (i.e., involving the active exchange of earlier experiences with colleagues). We expect that these will add to the effectiveness of the intervention by enabling colleagues to learn from each other and from their own past behaviors.

Second, this research contributes to the job crafting literature by examining the effects of job crafting on various work outcomes with experimental field studies. Past studies on job crafting have suggested that proactively optimizing one's job can be beneficial for individuals, but results are mainly correlational and further information is needed to decipher directionality of the effects (Leana, Applebaum, & Shevchuk, 2009; Petrou et al., 2012; Van den Heuvel et al., 2015). We present the first set of field studies investigating the effect of a job crafting intervention on a range of employees' well-being outcomes, including work engagement, health, and exhaustion as well as on subjective (task, contextual, adaptive) and objective performance outcomes using a quasi-experimental study design. In this way, our studies uncover whether job crafting is really contributing to improve employee well-being and functioning.

1.1. Towards individual job redesign interventions

Organizational processes seem too complex to be captured in (only) strict “traditional” job redesign approaches (Briner & Reynolds, 1999; Erdogan & Bauer, 2005), and positive, proactive interventions (that work) are scarce but needed in all work domains (Biron, Karanika-Murray, & Copper, 2012; Meyers et al., 2013). Job redesign theories have been developing since the 1950s with the “motivation-hygiene theory” (Herzberg, Mausner, & Snyderman, 1959), which began increasing our understanding of job satisfaction, superior performance, and the roles of intrinsic motivation and extrinsic hygiene factors (e.g., pleasant working conditions). Later, “socio-technical systems theory” started accounting for the mix and interdependencies of the social and technical aspects of work and introduced the autonomous work group (Trist, Higgin, Murray, & Pollock, 2013). Then the “job characteristics theory” (JCT; Hackman & Oldham, 1976) took an interactive approach to how individual differences and job characteristics affected individual responses to work (e.g., attitudes and behavior), which enhanced internal work motivation, and highlighted the role of the individual with regard to job characteristics (Oldham & Hackman, 2010). Interest in employee participation heightens and then fades in approximately twenty-year cycles (Ramsay, 1977). Since managerial interest in employee proactive participation changes over time, these “cycles of control” over work keep occurring (Ramsay, 1977). There needs to be a joining of the interests of the individual and the organization (larger system) in which both can mutually benefit (Bakker, 2017; Pignata, Biron, & Dollard, 2014) and better understand job control (Bond, Flaxman, & Bunce, 2008).

Exploring job crafting within the JD-R model can increase our understanding of the motivating and inhibiting factors that drive employees at work and aid in developing job redesign interventions to target these factors. In detail, the JD-R model considers individuals as active agents in the ever-changing work context (Demerouti, 2014), who can be motivated to optimize their job demands (i.e., aspects of work that require effort) and resources (i.e., aspects of the job that facilitate effective functioning) to achieve their work goals (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). In the JD-R model, job demands are the effortful, physical, psychological, social or organizational aspects of a job that require effort and can result in strain and energy depletion (Bakker & Demerouti, 2014). Job resources are the physical, psychological, or social aspects of a job that stimulate growth and

learning, and help individuals to achieve their goals. Job demands cost effort and may lead to health impairment (i.e., stress), while job resources provide energy and lead to motivation (i.e., work engagement; Bakker & Demerouti, 2014; Tims, Bakker, & Derks, 2013). JD-R theory proposes that when high but manageable job demands are balanced with high job resources, it results in positive individual and organizational outcomes because employees are able and willing to do their best.

Expanding job redesign with job crafting could be the answer to a pressing human resource management question, namely how organizations can create more opportunities for challenge, growth, and engagement (Harter & Blacksmith, 2010). Moreover, job crafting may be an avenue to integrate job design and job stress theories, by exploring the role of job stressors and job demands in combination with the motivating role of job resources (Bakker, 2017). Job crafting specifically refers to individuals changing or crafting the boundaries or conditions of their job (i.e., job demands and resources) to increase their work meaning (e.g., develop knowledge or skills to help in goal attainment; Berg et al., 2008; Tims et al., 2013; Wrzesniewski & Dutton, 2001). Job crafting within the JD-R model is defined with regard to the following dimensions: 1) seeking challenges, 2) seeking resources, and 3) reducing demands (Demerouti & Bakker, 2014; Petrou et al., 2012).

Seeking challenges (e.g., undertaking new assignments) occurs when employees seek to expand the scope of their jobs, or when employees are bored or need more challenges at work (Berg et al., 2008). *Seeking resources* (e.g., asking for feedback) occurs when resources are lacking or when demands are high and employees need a buffer (Bakker & Demerouti, 2014). Seeking challenges and resources are facilitating work strategies that - although effortful - are intrinsically motivating and can enhance individuals' well-being. Behaviors aimed at increasing job resources may increase well-being; job resources play either an intrinsic motivational role by fulfilling basic human needs, or an extrinsic motivational role through the satisfaction of successful task completion (Bakker & Demerouti, 2007, 2017). Employees who seek more resources and challenges are found to be more engaged and satisfied with their job and experience less burnout (e.g., exhaustion and disengagement; Petrou et al., 2012; Petrou, Demerouti, & Schaufeli, 2015; Tims et al., 2013). When individuals seek challenges they are motivated to stretch their capacities, engage in active learning, and utilize their (coping) resources, which can in turn enable them to achieve their work goals and enhance their performance (Petrou et al., 2015).

Reducing demands (e.g., checking emails only at certain times during the day) occurs when employees' job demands become overwhelming or hindering and they decrease them to prevent burnout (LePine, Podsakoff, & LePine, 2005). The demanding aspects of employees' jobs can overstretch them and constantly require their effort, which can empty their energy resources. Unlike seeking challenges, reducing demands involves decreasing work or making it less strenuous (LePine et al., 2005; Petrou et al., 2012). However, negative relationships between reducing demands and outcomes such as work engagement have also been found (Petrou et al., 2012; Tims et al., 2012).

1.2. The present study

1.2.1. Job crafting and well-being

We focus on three relevant indicators of well-being in healthcare: work engagement, exhaustion, and health. Work engagement is viewed as an active, motivational state that is comprised of vigor (i.e., high energy, effort, and persistence with difficulties), dedication (i.e., enthusiastically invested in work), and absorption (i.e., concentrated and focused on work; Schaufeli & Bakker, 2004). Exhaustion is an aspect of burnout and is comprised of fatigue from prolonged job demands (Demerouti, Bakker, Vardakou, & Kantas, 2003). Increases in job demands are expected to lead to exhaustion and health impairment (strain) processes (i.e., ill physical or psychological health; Bakker & Demerouti, 2014), whereas job resources are initiators of a motivational process and increase work engagement (Tims & Bakker, 2010). Additionally, Tims, Bakker, and Derks (2016) found that job crafting was related to increased employee "person-job fit" one week later and to increased meaningfulness two weeks later. Ghitulescu (2007) showed that job crafting activities can have a positive influence on individuals' well-being via increased job satisfaction. Changing job demands and resources with proactive strategies like job crafting is expected to decrease exhaustion and increase both work engagement and health because individuals are actively making their work more what they want it to be, given their strengths/abilities, skills, and working preferences/abilities (Tims et al., 2012). We suggest that reducing demands may lower feelings of exhaustion (Salmela-Aro, Tolvanen, & Nurmi, 2009) because it is related to the perception of lower work pressure (Demerouti, Bakker, & Halbesleben, 2015), and diminishes the required effort and costs associated with job demands. Individuals may reduce hindering job demands in order to prevent their negative effects (e.g., burnout; LePine et al., 2005), whereas increasing challenging demands contributes to work engagement. Therefore, we predict that the job crafting intervention will positively influence participants' well-being over time. Increasing job demands and resources are expected to influence work engagement positively (Petrou et al., 2012), while decreasing demands is expected to decrease exhaustion (Petrou et al., 2015).

1.2.2. Job crafting and performance

Although some research has found that job crafting and other positive, proactive work strategies can increase performance and yield organizational benefits (i.e., better skills, personal growth; Crawford, LePine, & Rich, 2010; Demerouti & Bakker, 2014; Lyons, 2008), more research is needed examining the overall effects of job crafting on performance. It is expected that employees are able to perform their jobs better by having the control needed to influence their daily work environment with job crafting. We examined how optimizing one's job demands and resources is related to different performance outcomes, namely task (i.e., in-role work behavior), contextual (i.e., extra-role work behavior; Williams & Anderson, 1991), and adaptive performance (i.e., tailored performance to each organizations' needs; Metselaar, 1997). When individuals are overstretched at work and their energy and resources drained, reducing demands may be an opportunity for them to protect themselves while helping them to remain functioning (i.e., perform) over time

(Petrou et al., 2015). Reducing demands negatively influences performance if the tasks that are dropped are important for performing work duties (Leana et al., 2009). However, more research is needed to understand the possible favorable and unfavorable outcomes of job crafting (Demerouti & Bakker, 2014; Koltz & Bolino, 2013). Since reducing demands when they become too high can also help employees achieve their work goals (Tims & Bakker, 2010), we suggest that it will facilitate their performance. Our study advances intervention research by examining not only subjective but also objective performance data, alleviating concerns of common method bias and demand characteristics.

1.3. Hypotheses

The intervention is framed within the JD-R model since this model has often been used to examine employee well-being and performance (Bakker & Demerouti, 2017). A similar job crafting intervention among police officers was found to increase participants' well-being (i.e., decreased negative emotions), job resources (i.e., leader-member exchange [LMX], opportunity for development), and self-efficacy (Van den Heuvel et al., 2015). As the effects found by Van den Heuvel and colleagues were rather weak, we modified their intervention in several respects. Adjustments were made to the intervention to increase individuals' understanding and application of job crafting behaviors into their daily work by stimulating their past learning experiences.

In sum, the following hypotheses were formulated:

Hypothesis 1. *Health care professionals participating in the job crafting intervention will report (a) higher levels of work engagement and health and (b) lower levels of exhaustion after the intervention compared to health care professionals in the control group.*

Hypothesis 2. *Health care professionals participating in the job crafting intervention will report higher levels of subjective (i.e., adaptive, task, and contextual) and objective job performance after the intervention compared to health care professionals in the control group.*

Hypothesis 3. *The effect of the intervention on (a) work engagement and health, (b) exhaustion, and (c) subjective adaptive, task, and contextual performance will be mediated by job crafting.*

2. Methods

2.1. Participants and procedure

Two job crafting interventions were tested in different settings, one with medical specialists and the other with nurses in The Netherlands. Both studies had a quasi-experimental control group pre-test - post-test design.

2.1.1. Study 1

The medical specialists in Study 1 had the following demographics: total $N = 119$; experimental group $n = 48$: age $M(SD) = 50.8$ (8.1) years; 58.3% male; work experience $M(SD) = 22.5$ (9.1) years; control group $n = 71$: age $M(SD) = 51.3$ (7.3) years; 81.8% male; work experience $M(SD) = 22.4$ (8.7) years. There were more males than females in the control group ($\chi^2[2, N = 119] = 7.80$, $p < 0.01$). From the initial 131 participants, twelve individuals (9.1%) began either the pre- or post-questionnaire and completed less than one-third of the items. Therefore, their responses were excluded. For the final sample, the missing values for individual items (over the three questionnaires) ranged from 16% to 35%.

2.1.2. Study 2

The nurses in Study 2 had the following demographics: total $N = 58$; experimental group $n = 32$: age $M(SD) = 41.2$ (11.3) years; 12.5% male; work experience $M(SD) = 21.6$ (11.3) years; control group $n = 26$: age $M(SD) = 31.2$ (8.8) years; 7.7% male; work experience $M(SD) = 12.4$ (9.3) years. The experimental group had more work experience than the control group ($t[56] = 3.33$, $p < 0.01$). Of the 60 nurses that participated in the interventions, 32 returned the completed booklets including both measurements; of the 60 nurses in the control group, 26 returned the completed booklets. It was in the hospital's best interest to have whole units volunteer to participate in trainings together since the objective measure was at the unit-level. All nurses of one unit were randomly assigned to the experimental or the control group. We expect the interaction between employees within units is more likely than between units, reducing concerns regarding cross-contamination.

2.2. Tailored intervention programs

2.2.1. Design

Participation in each intervention was voluntary. Both interventions were designed to fit to the organizations' and individuals' needs by using information derived from the interviews held with management and potential participants before the interventions. Participants completed a baseline (pre-intervention) questionnaire and were invited to participate in an intervention within the organization. After the intervention, in both studies, participants received a follow-up (post-intervention) questionnaire, followed by a one-page summary with graphs of selected scores (per department) on variables that were not directly related to the intervention such as cynicism (another aspect of burnout). These compared the departments participating in the intervention to benchmark scores from the Dutch population. Additionally, in Study 1, after completing each questionnaire all participants received personalized online feedback showing their individual mean scores on selected variables compared to the benchmark scores. The interventions were

conducted in small groups of up to 15 participants to facilitate active participation.

The intervention design was roughly the same for both Study 1 and 2. Both organizations were undergoing their own organizational changes. The board of medical specialists (Study 1) wanted to increase employee teamwork and quality of care. The nurse managers (Study 2) wanted to increase the number of checklists that were completed by employees to screen elderly patients. The job crafting interventions were requested to support the desired organizational changes.

Both included three-hour workshops in which participants were informed and trained on all job crafting strategies (i.e., seeking challenges, seeking resources, and reducing demands), and included participants sharing experiential learning narratives. The latter was accomplished by creating an exercise for the intervention based on the “thinking-in-action approach” (Benner, 1984; Benner et al., 2011), which integrates nursing theory in practice with the use of experiential learning in the form of narratives to build expert clinical judgment (i.e., *situated experiential learning narratives*; SELN). Simulated patient encounters and experiential narratives are being successfully used in medical schools and nursing (Benner et al., 2011), however organizational interventions have yet to test their application in motivating employees or in combination with other innovative strategies. The SELN were added to help stimulate participants' actualization and understanding of how their work behaviors can be viewed as a form of job crafting. Stimulating reflection from actual (past) situations can help individuals to bridge the gap between positive past behavior and future goals (i.e., stimulate actualization of job crafting) and to increase their understanding of what helps them proactively adjust their jobs (Benner, 1984). Through various explanations and exercises during the workshop, employees got to know the concept of job crafting. The workshop concluded with the development of a *personal crafting plan* (PCP). The PCP consists of specific crafting actions that the participants formulated and undertook for a period of three weeks after the workshop.

2.2.2. Study 1

Study 1 had a more general job crafting focus in which the narrative and job crafting goals were based around the successful implementation of effective teamwork and the quality of care. Further, all job crafting strategies were promoted in the workshops/training to reach the aforementioned goals. We had a waiting-list control group that was enabled by providing the intervention in two waves to allow for participants to complete either the pre- or the post-measurement. Experimental participants attended one of the eight workshops. The first four workshops were “wave 1” and the last four “wave 2”; “wave 2” participants were controls in “wave 1”. However, experimental participants who completed the intervention in “wave 1” could not be used as controls in the second wave. Participants who completed “wave 1” could not participate again in the intervention in “wave 2”. The training groups were a mixture of participants from different departments. We administered three measures, each three months apart: time 1 was prior to intervention “wave 1”, time 2 was after intervention “wave 1” and prior to intervention “wave 2”, and time 3 was after intervention “wave 2”.

All participants received their personalized online feedback and the intervention participants received online follow-up (job crafting) reminders of their crafting goals three weeks following the intervention. According to the PCP, participants for this study had to seek resources (week 1; e.g., social support from colleagues; “Today I will call colleague X to ask them about their feedback on X”), seek challenges (week 2; e.g., volunteer for congress/committee; “Today I will join a new congress or committee that I support”), and reduce demands (week 3; e.g., time management; “Today I will register my patients during or directly following the patient visit to save time”). On Monday, we asked each participant by email what their job crafting goal was for that week (i.e., set in the PCP during the training); on Friday we asked them again whether they had achieved their weekly goal. Participants were invited (via posters and their supervisor) to subscribe to the offered workshops.

2.2.3. Study 2

Study 2 had a specific job crafting focus. The goal for the nurses was to increase the number of completed checklists that they used to screen elderly patients (> 70 years) and monitor the patients' risk to develop complications (e.g., delirium) during their hospital stay. The design of Study 2 consisted of two repeated measures with one intervention wave, resulting in one pre- and one post- (+ 1.5 months) measurement. The organization preferred separate workshops per unit to complete the training.

In the trainings, individuals shared and then tailored their own PCP and goals (to increase checklist completion). Three of the six units served as control groups. Participants in this study had the following PCP: seeking resources (weeks 1 and 3; e.g., ask for feedback; “Next Tuesday at 11.30h I am going to ask feedback about how I helped patient X out of bed, because patient X is at risk of falling”), and reducing demands (week 2; e.g., work more efficient; “Today I am going to fill in the screening directly after the intake of every new patient older than 70 years instead of leaving it until the end of the day”). Seeking challenges was excluded as a weekly goal, since completing the checklist was already considered a challenging task.

2.3. Measures

In both studies, validated scales were used to assess the constructs at all time points. Note, however, that the original answer formats for two scales (health and adaptive performance) were adapted in Study 1 to allow comparison with previously collected benchmarks based on the Dutch working population. Specifically, the answer formats for both were increased from 5 to 6 (adaptive performance) and 5 to 10 (health) response options.

2.3.1. Job crafting

The Job Crafting Scale (Petrou et al., 2012) includes thirteen items; seeking job challenges (e.g., “I ask for more tasks if I finish my work”), seeking job resources (e.g., “I ask others for feedback”), and reducing (hindering) job demands (e.g., “I try to ensure that my work is emotionally less intense”). The scale ranged from 1 (*never*) to 5 (*always*). This scale has been validated on both the daily and

general level, and has been shown to have good predictive and construct validity (Petrou et al., 2015).

2.3.2. Work engagement

The short version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Salanova, 2006) has nine items to assess three dimensions; vigor (e.g., “At my work, I feel bursting with energy”), dedication (e.g., “I am enthusiastic about my job”), and absorption (e.g., “I am immersed in my work”). The scale ranged from 0 (*never*) to 6 (*always/every day*). This scale has been validated across cultures and occupations (Hu et al., 2014; Schaufeli et al., 2006).

2.3.3. Exhaustion

This was measured with the Dutch version of the Oldenburg Burnout Inventory (OLBI; Demerouti et al., 2003), which is comprised of eight items (e.g., “After my work, I usually feel worn out and weary”). The scale ranged from 1 (*totally disagree*) to 4 (*totally agree*). Exhaustion is the clearest response to job stressors and the construct validity of the OLBI has been compared with the Maslach Burnout Inventory – General Survey (MBI-GS; e.g., predicting long-term absence; Peterson et al., 2011).

2.3.4. Health

This was assessed with one item from Sullivan and Karlsson's (1998) SF-36 Health Survey measuring self-rated health (e.g., “In general, I feel very healthy”). The scale ranged from 1 (*totally not applicable to me*) to 10 (*totally applicable to me*). High scores indicate a high-level of (self-rated) health. Poor health has been found to be a powerful predictor of long-term absence (Peterson et al., 2011). Youngblut and Casper (1993) support the use of single-item measures for survey research and Bowling (2005) found it to be a valid indicator of health.

2.3.5. Adaptive performance

For Study 1, we used Metselaar's (1997) four-item subjective measure of Willingness to Change to assess the willingness of medical specialists to implement the organizational changes aimed at improving the quality of care (e.g., “I am willing to make time for the introduction of the changes in my department.”). For Study 2, four-items were formulated to assess whether nurses completed a screening checklist (e.g., “I use the checklist in the care chart”) that was developed based on organizational interviews and in line with Griffin, Neal, and Parker (2007). This measure is valid and reliable (Van den Heuvel, Demerouti, Bakker, & Schaufeli, 2013); the scales ranged from 1 (*strongly disagree*) to 6 (*strongly agree*; Study 1), and 1 (*never*) to 5 (*extremely often*; Study 2).

2.3.6. Task and contextual performance

For Study 1, Goodman and Syvante's (1999) six-item scale was used to measure subjective task performance (e.g., “Achieves the objectives of the job”) and subjective contextual performance (e.g., “Willingly attends functions that are not part the job, but help in the overall image of the organization”). The scale ranged from 0 (*not at all characteristic*) to 6 (*totally characteristic*). For Study 2, Williams and Anderson's (1991) fourteen-item scale was used for task performance (e.g., “Today, I adequately completed my assigned duties”) and contextual performance (e.g., “I help others who have heavy workloads”). The scale ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Both scales have been widely used in previous studies (e.g., Gorgievski, Bakker, & Schaufeli, 2010; Tims et al., 2015). The two measures of task and contextual performance can be empirically distinguished, and are differentially related to other variables in the expected way (e.g., Bakker, Demerouti, & Verbeke, 2004; Demerouti, Xanthopoulou, Tsaousis, & Bakker, 2014). Thus, there is sufficient evidence for the construct validity of both performance measures.

2.3.7. Objective performance

For Study 2, the hospital provided us with the objective count/numbers (measurement density) of the completed checklists for all departments for the twelve months prior to the intervention, but only provided the experimental unit count one month prior and after the intervention. The total count per department was used to compare whether there was an increase in the percentage of patients older than 70 years old that had been screened in the experimental units (i.e., measurement density).

2.3.8. Analysis

Data were analyzed with SPSS General Linear Modeling (GLM) repeated measures to test the hypothesized intervention effects over time. Multilevel analyses with MLwiN (Rasbash, Steele, Browne, & Goldstein, 2009) were conducted to determine whether job crafting (i.e., the manipulation check) explained the effect of the intervention on well-being or performance in both studies. This is because the observations are nested within the individual. In the analyses, time (pre-, post-measure) is nested in person and group membership (control vs. experimental), and is included as a dummy variable (see Le Blanc et al., 2007), while their interaction signifies the effect of the intervention. All continuous explanatory variables were centered to the person-mean. Finally, the four steps of Baron and Kenny (1986) were followed to examine the mediation effect with multilevel analyses in MLwiN (Rasbash et al., 2009) and Sobel tests (Preacher & Leonardelli, 2003). This was done to test if the intervention was responsible for changes in job crafting, which then influenced the different outcome measures.

Table 1
Means and SD of the study variables at the pre- and post-measurement occasions for Study 1 and 2.

Variable	Experimental		Control		t-Test		Cohen's	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Study 1								
JC: seeking challenges pre ^a	2.47	0.73	2.63	0.74	1.17	117	0.25	– 0.22
JC: seeking challenges post	2.75	0.63	2.54	0.62				
JC: seeking resources pre ^a	3.24	0.54	3.31	0.52	0.74	117	0.46	– 0.13
JC: seeking resources post	3.28	0.53	3.28	0.52				
JC: decreasing demands pre ^a	2.03	0.68	2.11	0.69	0.67	117	0.51	– 0.12
JC: decreasing demands post	2.29	0.87	2.01	0.78				
Work engagement pre ^b	4.03	0.90	4.08	0.93	0.30	117	0.77	– 0.06
Work engagement post	4.21	1.00	3.72	1.10				
Exhaustion pre ^a	1.93	0.49	1.88	0.47	– 0.56	117	0.58	0.15
Exhaustion post	1.86	0.45	2.04	0.53				
Health pre ^d	8.41	1.20	8.57	1.21	0.70	117	0.49	– 0.13
Health post	8.76	2.65	7.88	2.04				
Adaptive performance pre ^e	4.69	0.94	5.02	1.16	1.61	117	0.11	– 0.31
Adaptive performance post	4.91	0.67	4.75	0.95				
Task performance pre ^b	4.32	0.97	4.54	0.85	1.28	117	0.20	– 0.24
Task performance post	4.53	1.24	4.29	0.98				
Contextual performance pre ^b	3.82	1.00	3.95	1.18	0.62	117	0.54	– 0.12
Contextual performance post	4.08	1.08	3.60	1.32				
Study 2								
JC: seeking challenges pre ^a	3.23	0.70	3.29	0.77	0.32	56	0.75	– 0.08
JC: seeking challenges post	3.23	0.64	3.20	0.63				
JC: seeking resources pre ^a	3.46	0.47	3.65	0.55	1.44	56	0.16	– 0.37
JC: seeking resources post	4.05	0.54	3.57	0.55				
JC: decreasing demands pre ^a	2.03	0.52	2.02	0.59	– 0.11	56	0.91	0.02
JC: decreasing demands post	2.41	0.57	2.16	0.48				
Work engagement pre ^b	4.10	0.74	4.00	0.62	– 0.59	56	0.56	0.14
Work engagement post	4.68	0.74	4.07	0.67				
Exhaustion pre ^c	2.20	0.45	2.36	0.37	1.50	56	0.14	0.36
Exhaustion post	2.05	0.37	2.42	0.34				
Adaptive performance pre ^a	2.95	0.97	3.06	0.85	0.43	56	0.67	– 0.12
Adaptive performance post	3.70	0.93	3.14	0.93				
Task performance pre ^a	4.10	0.40	4.15	0.45	0.46	56	0.65	– 0.12
Task performance post	4.27	0.32	4.13	0.44				
Contextual performance pre ^a	3.96	0.36	3.96	0.32	0.07	56	0.95	0.00
Contextual performance post	4.00	0.34	3.95	0.25				

Note. ^a Scale 1–5, ^b Scale 0–6, ^c Scale 1–4, ^d Scale 1–10, ^e Scale 1–6.

3. Results

3.1. Preliminary analysis

For Study 1 SPSS Missing Values Analysis (MVA) with Little's MCAR test revealed that the data was missing at random ($\chi^2[100, N = 119] = 88.10, p = 0.80$), allowing for listwise deletion of the 12 participants who completed less than one-third of the items on the pre- or post-questionnaires (Garson, 2015). Further, for the missing values on individual items, we used expectation-maximization (EM) replacement. This is based on the observed data loglikelihood and is more efficient than the multiple-imputation (MI) method because it does not require simulations to “fill in” missing data (i.e., iterating between the E and M steps; Dempster, Laird, & Rubin, 1977; Dong & Peng, 2013). EM is also appropriate for unbalanced designs including repeated measures (Peng, Harwell, Liou, & Ehman, 2006). For Study 2, we could not conduct the MCAR test because we only received completed booklets (for both measures), and there were no other missing values on individual items as the nurses adhered to the instructions of the research assistant who was present daily at the hospital during the study.

A series of *t*-tests were conducted to assess for pre-intervention differences for Study 1 and 2 on work engagement, exhaustion, health (only Study 1), adaptive performance, task performance, and contextual performance. As indicated in Table 1, the experimental group did not differ from the control group on the pre-intervention scores. Details comparing the experimental and control groups on pre- and post-measurement occasions for both studies are presented in Table 1, and Cronbach's alphas are presented in Table 2 for both studies. Table 3 (Study 1) and Table 4 (Study 2) report the means, SDs and correlations among the study variables. For the manipulation check in Study 1, repeated measures ANOVAs for medical specialists revealed that after the intervention, participants in the intervention group reported higher levels of seeking challenges; $F(1, 117) = 5.31, p = 0.02$ and reducing demands; $F(1, 117) = 4.66, p = 0.03$, but not of seeking resources; $F(1, 117) = 0.54, p = 0.46$, than participants in the control group

Table 2
Results of repeated measures GLM and reliability for job crafting, well-being and performance variables (Study 1 & 2).

Variables	SS	df	MS	F	p	Partial η^2	$\alpha_{Pre}/\alpha_{Post}$
Study 1							
Job crafting							
Seeking challenges	1.93	1	1.93	5.31	0.02*	0.04	0.84/0.87
Seeking resources	0.08	1	0.08	0.54	0.46	0.01	0.56/0.59
Reducing demands	1.95	1	1.95	4.66	0.03*	0.04	0.82/0.82
Well-being							
Work engagement	4.25	1	4.25	9.30	0.01**	0.07	0.93/0.93
Exhaustion	0.78	1	0.78	5.00	0.03*	0.04	0.88/0.89
Health ^a	7.48	1	7.48	5.83	0.02**	0.05	N.A.
Performance							
Adaptive performance	3.39	1	3.39	5.48	0.02*	0.05	0.95/0.93
Task performance	2.94	1	2.94	5.83	0.02*	0.05	0.93/0.96
Contextual performance	5.34	1	5.34	5.62	0.02*	0.05	0.82/0.84
Study 2							
Job crafting							
Seeking challenges	0.06	1	0.06	1.03	0.31	0.02	0.75/0.66
Seeking resources	3.24	1	3.24	29.49	0.00***	0.35	0.72/0.73
Reducing demands	0.38	1	0.38	4.99	0.03*	0.08	0.63/0.59
Well-being							
Work engagement	1.82	1	1.82	15.51	0.00***	0.22	0.91/0.93
Exhaustion	0.29	1	0.29	14.33	0.00***	0.20	0.83/0.79
Performance							
Adaptive performance	3.16	1	3.16	12.30	0.00***	0.18	0.91/0.91
Task performance	0.25	1	0.25	3.83	0.06	0.06	0.81/0.77
Contextual performance	0.02	1	0.02	0.60	0.44	0.01	0.83/0.72

Note. Reliability was measured with Cronbach's alphas and is presented for the pre- and post-measures. All alphas were sufficient (i.e., above 0.70; see Nunnally & Bernstein, 1994) except seeking resources (Study 1) and reducing demands (Study 2), which was considered during the interpretation of the results.

^aHealth consisted of one item, not allowing for the alpha to be computed.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

(see Table 2). For Study 2, repeated measures ANOVAs for the nurses revealed that participants in the intervention group reported higher levels of seeking resources; $F(1, 56) = 29.49$, $p < 0.001$ and reducing demands; $F(1, 56) = 4.99$, $p = 0.03$, but not of seeking challenges; $F(1, 56) = 1.03$, $p = 0.31$, than participants in the control group (see Table 2). This was expected since nurses were not instructed to seek challenges. Overall, both interventions had the expected effects on job crafting behaviors.

3.2. Effects of intervention on well-being and performance

For Study 1, repeated measures ANOVAs provided evidence for Hypothesis 1a since the intervention group reported significantly higher levels of work engagement; $F(1, 117) = 9.30$, $p < 0.01$, and health; $F(1, 117) = 5.83$, $p = 0.02$, than the control group at the follow-up (see Table 2). In addition, support for Hypothesis 1b was found, due to the lower levels of exhaustion reported at the follow-up by the intervention group; $F(1, 117) = 5.00$, $p = 0.03$ than the controls. Hypothesis 2 was supported, because at the follow-up the intervention group had significantly higher levels of adaptive; $F(1, 117) = 5.48$, $p = 0.02$; task; $F(1, 117) = 5.83$, $p = 0.02$; and contextual performance; $F(1, 117) = 5.62$, $p = 0.02$; than the control group (see Table 2).

For Study 2, repeated measures ANOVAs provided evidence for Hypothesis 1a, since at the follow-up the intervention group had significantly higher levels of work engagement; $F(1, 56) = 15.51$, $p < 0.001$ than the control group (see Table 2). Evidence was also found for Hypothesis 1b because at the follow-up the intervention group had significantly lower levels of exhaustion than the control group; $F(1, 56) = 14.33$, $p < 0.001$. Further, we found partial evidence for Hypothesis 2 as the intervention group had significantly higher levels of adaptive performance; $F(1, 56) = 12.30$, $p < 0.001$. However, the comparison of the intervention and control group for task performance did not meet criteria for significance; $F(1, 56) = 3.83$, $p = 0.06$ (see Table 2; although the partial eta squared of 0.06 is consistent with a small to moderate effect). We also found no effect of the intervention on contextual performance; $F(1, 56) = 0.44$, $p = 0.44$. Results for objective (unit) performance (i.e., measurement density) revealed no significant improvement in any of the experimental units, while according to the hospital, the control units did not change over time either (see Table 5). Hypotheses 1 and 2 were supported in both studies, except for Hypothesis 2 in Study 2 for subjective contextual and task performance, as well as objective performance.

3.3. Mediation

Hypothesis 3 was examined with multilevel (mediation) analyses to see if the intervention was responsible for individuals' changes in job crafting, and if this explained changes in well-being and performance. In Study 1, step 1 tested and found that the intervention (group x time) was significant and related positively to work engagement ($\beta = 0.55$, $SE = 0.26$, $t = 2.10$, $p = 0.05$) and

Table 3
Correlations among the study variables at the pre- and post-measurement occasions (Study 1).

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. JC: seeking challenges pre	2.56	0.73																	
2. JC: seeking challenges post	2.63	0.63	0.24**																
3. JC: seeking resources pre	3.28	0.53	0.32**	0.06															
4. JC: seeking resources post	3.28	0.52	0.26**	0.31**	0.47**														
5. JC: reducing demands pre	2.08	0.68	0.35**	-0.13	0.05	0.18*													
6. JC: reducing demands post	2.12	0.82	-0.07	0.12	-0.11	-0.11	0.12												
7. Work engagement pre	4.06	0.91	0.19**	0.11	0.32**	0.19**	-0.07	-0.13											
8. Work engagement post	3.92	1.09	0.17*	0.29**	0.18*	0.17*	-0.08	-0.67**	0.30**										
9. Exhaustion pre	1.90	0.48	-0.20**	-0.27**	-0.42**	-0.31**	0.19**	0.03	-0.75**	-0.20**									
10. Exhaustion post	1.97	0.51	-0.19**	-0.36**	-0.29**	-0.29**	0.07	0.54**	-0.35**	-0.80**	0.35**								
11. Health pre	8.50	1.20	-0.06	0.03	0.15*	-0.03	-0.36**	-0.11	0.35**	0.13	-0.37**	-0.19**							
12. Health post	8.23	2.34	0.13	0.27**	0.23**	0.14	-0.09	-0.68**	0.12	0.83**	-0.11	-0.69**	0.22**						
13. Adaptive performance pre	4.89	1.09	0.32**	0.05	0.58**	0.14	0.04	-0.10	0.47**	0.17*	-0.35**	-0.14*	0.14*	0.15*					
14. Adaptive performance post	4.81	0.85	0.15*	0.28**	0.27**	0.46**	-0.01	0.03	0.33**	0.22**	-0.33**	-0.30**	0.12	0.14*	0.25**				
15. Task performance pre	4.45	0.90	0.08	-0.09	0.18*	0.11	-0.05	-0.10	0.46**	0.12	-0.29**	-0.14*	0.15*	0.07	0.29**	0.20**			
16. Task performance post	4.39	1.10	0.02	0.19**	0.16*	0.14*	0.01	-0.17*	0.26**	0.37**	-0.23**	-0.43**	0.16*	0.31**	0.21**	0.33**	0.37**		
17. Contextual performance pre	3.90	1.11	0.19**	0.03	0.33**	0.11	-0.04	-0.11	0.43**	0.14*	-0.37**	-0.15*	0.28**	0.16*	0.42**	0.15*	0.37**	0.17*	
18. Contextual performance post	3.79	1.25	-0.11	0.04	0.09	-0.03	-0.17*	0.48**	0.30**	-0.38**	-0.31**	0.11	0.19**	-0.44**	0.12	0.29**	0.11	0.24**	0.22**

Note. N = 119.

* p < 0.05, ** p < 0.01, *** p < 0.001.

Table 4
Correlations among the study variables at the pre- and post-measurement occasions (Study 2).

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. JC: seeking challenges pre	3.25	0.10															
2. JC: seeking challenges post	3.22	0.08	0.87**														
3. JC: seeking resources pre	3.55	0.07	0.53**	0.46**													
4. JC: seeking resources post	3.83	0.08	0.31*	0.34**	0.47**												
5. JC: reducing demands pre	2.02	0.07	-0.03	0.06	-0.12	-0.10											
6. JC: reducing demands post	2.30	0.07	0.08	0.08	-0.10	0.02	0.73**										
7. Work engagement pre	4.06	0.09	0.34**	0.40**	0.35**	0.26*	-0.10	-0.08									
8. Work engagement post	4.41	0.10	0.21	0.31*	0.20	0.57**	0.04	0.07	0.73**								
9. Exhaustion pre	2.30	0.06	-0.34**	-0.38**	-0.27*	-0.23	0.18	0.17	-0.60**	-0.55**							
10. Exhaustion post	2.22	0.05	-0.23	-0.35**	-0.15	-0.41**	0.15	0.05	-0.42**	-0.61**	0.85**						
11. Adaptive performance pre	3.00	0.12	0.16	0.13	0.20	0.02	-0.19	-0.25	0.11	0.01	0.08	0.15					
12. Adaptive performance post	3.45	0.13	0.12	0.08	0.14	0.26	-0.08	-0.02	0.03	0.27*	-0.06	-0.20	0.65**				
13. Task performance pre	4.13	0.05	-0.01	-0.03	0.28*	0.23	-0.26*	-0.26	0.34**	0.18	-0.19	-0.19	0.10	0.04			
14. Task performance post	4.21	0.05	-0.22	-0.17	0.03	0.14	-0.17	-0.13	0.18	0.33*	-0.17	-0.27*	0.08	0.22	0.58**		
15. Contextual performance pre	3.96	0.04	0.05	-0.01	0.15	0.14	-0.23	-0.32*	0.48**	0.27*	-0.32*	-0.23	0.29*	0.17	0.58**	0.37**	
16. Contextual performance post	3.98	0.04	-0.06	0.03	0.09	0.31*	-0.10	-0.12	0.35**	0.40**	-0.26*	-0.33*	0.19	0.25	0.46**	0.45**	0.74**

Note. N = 58.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5
Measurement density (objective measure) of intervention groups (Study 2).

Measurement occasions	Experimental departments			
	1	2	3	Combined average
	Measurement density in %			
Yearly average completed checklists	59.6	9.8	46.1	38.5
Pre-intervention completed checklists	60.4	40.0	79.1	59.8
Post-intervention completed checklists	56.5	53.8	82.2	64.2

Note. $N = 58$. The three experimental units are listed. The Measurement density is the number of checklist that were completed to monitor patients older than 70 years. The Yearly average completed checklists provides the average number of checklists individuals completed (measurement density) for each experimental department for the twelve months before the intervention. Pre-intervention is the month prior to training and Post-intervention is the month after the training. The Combined average of completed checklists shows that overall the nurses in the experimental groups increased their completion of the checklists (measurement density) from 59.8%–64.2%. Results show that two of the three departments (2 and 3) that participated in the training increased their number of completed checklists compared to their yearly averages.

adaptive performance ($\beta = 0.49$, $SE = 0.26$, $t = 1.91$, $p = 0.03$; see Table 6). For Study 2, *step 1* showed a positive effect of the intervention on work engagement ($\beta = 0.50$, $SE = 0.26$, $t = 1.92$, $p = 0.03$; see Table 7).

For *step 2*, the mediating effect was tested to see if the intervention had a significant effect on the job crafting variables (mediators) that were previously found to change with the repeated measures analyses. In Study 1, seeking challenges and reducing demands were tested but only seeking challenges remained significant ($\beta = 0.37$, $SE = 0.18$, $t = 2.18$, $p = 0.02$). Similarly in Study 2, seeking resources and reducing demands were tested but only seeking resources remained significant ($\beta = 0.67$, $SE = 0.19$, $t = 3.46$, $p < 0.001$). Thus, in both studies, reducing demands was removed from further analyses as a mediator (except as a control variable) since this suggests that the changes in this dimension were not due to the intervention.

In *step 3*, the mediator needs to predict the outcome measure after controlling for the predictor. For Study 1, seeking challenges positively related to work engagement ($\beta = 0.24$, $SE = 0.10$, $t = 2.42$, $p < 0.01$) and adaptive performance ($\beta = 0.19$, $SE = 0.08$, $t = 2.38$, $p < 0.01$). For Study 2, seeking resources positively related to work engagement ($\beta = 0.47$, $SE = 0.12$, $t = 3.78$, $p < 0.001$).

In *step 4*, in order to conclude full mediation, the effect of the independent variables on the outcome must not be significant when the mediator is included. If the effect is still significant then it is partial mediation. For Study 1, the intervention (i.e., group \times time interaction) was still significantly related to work engagement ($\beta = 0.57$, $SE = 0.25$, $t = 2.26$, $p < 0.01$) and adaptive performance ($\beta = 0.37$, $SE = 0.21$, $t = 1.76$, $p = 0.04$), revealing partial mediation for both through seeking challenges. For Study 2, the effect was not significant for work engagement ($\beta = 0.18$, $SE = 0.24$, $t = 0.75$, $p = 0.23$), revealing full mediation through seeking resources. Partial support was provided for Hypothesis 3 in both studies with Sobel tests (Preacher & Leonardelli, 2003). In Study 1 the indirect effect through seeking challenges was significant for work engagement ($z = 1.62$, $SE = 0.25$, $p < 0.05$) and adaptive performance ($z = 1.62$, $SE = 0.25$, $p < 0.05$). In Study 2 the indirect effect through seeking resources was also significant for work engagement ($z = 2.55$, $SE = 0.24$, $p < 0.01$). Hypothesis 3 was not supported in Study 1 for exhaustion, health, or task and contextual performance through seeking challenges, and also not supported through seeking resources or reducing demands. For Study 2, Hypothesis 3 was not supported for exhaustion or any of the performance measures through seeking resources, and also not supported through seeking challenges or reducing demands. To summarize, these results reveal that the intervention positively related to some of the changes in individuals' job crafting behaviors (seeking challenges in Study 1 and seeking resource in Study 2), which then related significantly and positively to their well-being (in Study 2, in Study 1) and performance (in Study 1).

4. Discussion

The central aim of the present study was to examine the association between participation in two job crafting interventions and employee well-being and performance. Medical specialists and nurses were trained to optimize their own work environment positively and proactively (via job crafting), which resulted in personal and organizational benefits. Our findings highlight the importance for contemporary organizations to consider the value of job crafting interventions as a way to enhance employee work processes, strategies, and performance. Partial support was found for our central assumption that job crafting behaviors contribute to employee well-being, since there were changes in some indicators of well-being for participants in the intervention in each study. In Study 1 among medical specialists, significant changes in job crafting were found for seeking challenges and reducing demands, however the intervention seemed only to be associated with changes in well-being when individuals were seeking challenges but not when they were reducing demands. Seeking challenges was positively related to specialists' well-being and their task, adaptive, and contextual performance. Seeking resources decreased specialists' exhaustion and increased their adaptive and contextual performance. Reducing demands was related to a decrease in specialists' work engagement and health, and an increase of their exhaustion, but these changes were not associated with the intervention and future research should examine other potential sources (e.g., job insecurity). For Study 2, significant changes in seeking resources and reducing demands were found, but the intervention was only associated with a change in seeking resources and not in reducing demands. Moreover, seeking resources and seeking challenges were related to an increase in work engagement, while seeking challenges was related to a decrease in exhaustion, and reducing demands

Table 6
Results of multilevel analyses examining the effect of the intervention on well-being and performance through job crafting (Study 1).

Model	Work engagement		Exhaustion		Health		Adaptive performance		Task performance		Contextual performance	
	Estimate (SE)	t	Estimate (SE)	t	Estimate (SE)	t	Estimate (SE)	t	Estimate (SE)	t	Estimate (SE)	t
Intercept	4.07 (0.11)	37.00***	1.89 (0.05)	37.80***	8.52 (0.12)	6.25***	4.98 (0.09)	55.33***	4.53 (0.12)	37.75***	3.93 (0.13)	7.67***
Time	-0.37 (0.16)	-2.31**	0.16 (0.08)	2.00*	-0.80 (0.22)	-3.59***	-0.23 (0.13)	-1.77*	-0.24 (0.16)	-1.50	-0.33 (0.19)	-1.74*
Group	-0.03 (0.18)	-0.17	0.02 (0.08)	0.25	0.15 (0.25)	-2.99**	-0.23 (0.15)	-1.53	-0.18 (0.18)	-1.00	-0.08 (0.21)	-0.38
Time × group	0.57 (0.25)	2.28**	-0.22 (0.12)	-1.83*	0.98 (0.36)	2.72**	0.37 (0.21)	1.76*	0.42 (0.26)	1.62*	0.57 (0.30)	1.90*
Seeking challenges	0.24 (0.10)	2.40**	-0.16 (0.05)	-3.20***	1.00 (0.14)	0.71	0.19 (0.08)	2.38**	0.13 (0.10)	1.80*	0.07 (0.12)	3.50***
Seeking resources	0.17 (0.12)	1.42	-0.21 (0.06)	-3.50***	0.27 (0.17)	1.59	1.00 (0.10)	10.00***	0.20 (0.13)	1.54	0.62 (0.15)	4.13***
Reducing demands	-0.34 (0.09)	-3.78***	0.17 (0.04)	4.25***	-0.85 (0.12)	-7.08***	-0.07 (0.07)	1.38	-0.14 (0.09)	-1.56	-0.07 (0.10)	-0.70

Note. N = 119; time: 0 = pre and 1 = post; group: 0 = control and 1 = experimental. Single tailed testing since hypotheses are directional.
* p < 0.05, ** p < 0.01, *** p < 0.001.

Table 7

Results of multilevel analyses examining the effect of the intervention on well-being and performance through job crafting (Study 2).

Model	Work engagement		Exhaustion		Adaptive performance		Task performance		Contextual performance	
	Estimate (SE)	<i>t</i>	Estimate (SE)	<i>t</i>	Estimate (SE)	<i>t</i>	Estimate (SE)	<i>t</i>	Estimate (SE)	<i>t</i>
Intercept	4.00 (0.12)	16.67***	2.38 (0.07)	34.00***	3.03 (0.17)	16.83***	4.15 (0.07)	59.2***	4.14 (0.07)	59.14***
Time	0.13 (0.17)	0.77	0.02 (0.10)	0.20	0.15 (0.25)	0.60	0.01 (0.10)	0.10	-0.03 (0.09)	-0.33
Group	0.21 (0.16)	1.31	-0.20 (0.09)	-2.22**	-0.05 (0.24)	-0.21	-0.02 (0.10)	-0.20	-0.01 (0.09)	-0.11
Time × group	0.18 (0.24)	0.43	-0.14 (0.14)	-1.00	0.55 (0.35)	1.57	0.11 (0.15)	0.73	-0.05 (0.13)	-0.39
Seeking challenges	0.18 (0.10)	1.80*	-0.17 (0.05)	-3.40***	0.08 (0.14)	0.57	-0.11 (0.06)	1.83*	-0.04 (0.05)	-0.80
Seeking resources	0.47 (0.12)	3.92***	-0.11 (0.07)	-1.57	0.24 (0.18)	1.33	0.18 (0.08)	2.25**	0.17 (0.07)	2.43**
Reducing demands	-0.04 (0.11)	-0.36	0.13 (0.06)	2.17**	-0.22 (0.16)	-1.38	-0.14 (0.07)	-0.17	-0.09 (0.06)	-1.50

Note. *N* = 58; time: 0 = pre and 2 = post; group: 0 = control and 1 = experimental. Single tailed testing since hypotheses are directional.

* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001.

to an increase in exhaustion. Further, seeking challenges and resources both were related to increases in task performance, while seeking resources was related to an increase in contextual performance. In short, the interventions stimulated medical specialists' seeking challenges, which were associated with enhanced work engagement and adaptive performance, while it stimulated nurses' seeking resources, which was associated with enhanced work engagement. Overall, the intervention participants experienced improvements in their job crafting behaviors, well-being, and performance compared to non-participants.

4.1. Theoretical contributions

Our research contributes to the literature in at least three ways. First, the two studies found favorable support for job redesign interventions that utilize the proactive strategy of job crafting (with a general [Study 1] and a specific [Study 2] focus, respectively), since results found increases in employees' self-initiated behavior and positive changes in their well-being and performance. This suggests that job crafting interventions can inspire individuals to proactively and creatively adjust their job, which can be beneficial for employees and their organizations. Most importantly, the intervention enhanced the positive changes in participants' job crafting. Although reducing demands was found to have a negative relationship with well-being (Study 1), the change in this dimension of job crafting was not related to the intervention but possibly due to other unexplored work factors, a point we elaborate on later. This research provides a better understanding of how individuals can proactively change their well-being and performance (via job crafting) through achieving self-set goals aimed at redesigning their job characteristics (Meyers et al., 2013; Tims & Bakker, 2010). The JD-R model was used as a framework to investigate how the “fit” of an intervention impacts individuals' interactions with their work environment by self-regulating their job demands and resources (i.e., promotion or prevention strategies; Bakker & Demerouti, 2014; Nielsen, 2013; Petrou et al., 2012). Job crafting can help individuals to fulfill some basic needs by gaining control, meaning, and a positive self-image, while facilitating connections with others (Wrzesniewski & Dutton, 2001). The mechanism for intervention success may be the active involvement of employees in defining and achieving self-set job crafting goals, and the activating potential of SELN to help individuals reflect, share, and better actualize the job crafting behavior through “experiential learning” (Batalden & Davidoff, 2007; Benner, 1984).

Second, as predicted we found that our results were mostly consistent with our hypotheses that suggested the favorable relationships of job crafting with well-being and performance through the facilitated changes in various types of work performance. As suggested by past research, individual-level interventions (e.g., job crafting) represent a tool for enhancing employee well-being, performance, and other organizational outcomes (Demerouti & Bakker, 2014; Lyons, 2008; Meyers et al., 2013). Seeking resources were found to be important, especially in stressful conditions and can help facilitate organizational change (Bakker et al., 2007). Researchers similarly found the importance of having job resources (i.e., social support) in preventing burnout (Maslach, Schaufeli, & Leiter, 2001). The two groups differed in the importance of the specific job crafting dimensions. Seeking challenges were important for medical specialists, whereas seeking resources were important for nurses to improve their work engagement and performance. Prior to the interventions, interviews were conducted which revealed that it is not common practice for medical specialists to ask for help or feedback (e.g., about work-life balance issues). This behavior may be rooted in medical culture, and therefore may undermine the effectiveness of the strategy “seeking resources” for medical specialist although it proved to be a healthy work practice for nurses. As both organizations were involved in different forms of change, our results support the importance of job crafting during organizational change (Petrou et al., 2012). Results show that by encouraging employees to self-initiate their adaptations to the changes, and by providing them with opportunities to self-regulate (gain control) in uncertain, changing environments (via crafting their changing job), they remained healthier and performed better.

Our intervention study was different from previous positive organizational interventions because it examined the impact of

different work aspects, and the actions and behaviors that employees engage in to “fit” their jobs to their needs (Erdogan & Bauer, 2005; Meyers et al., 2013). We expanded upon Van den Heuvel et al.’s (2015) job crafting intervention by making it less demanding for participants and by integrating into it a new “thinking-in-action” approach (Benner, 1984) with SELN. The SELN helped participants to create their own job crafting goals more easily, by allowing individuals to learn from their own or others’ real-life experiences through sharing narrative stories of how their proactive behavior changed their thoughts, feelings, or relationships at work. After these reflections, they were better able to assign their behaviors to specific job crafting strategies. These modifications substantially improved the effectiveness of the intervention further than Van den Heuvel et al.’s (2015), which detected effects only when using *t*-tests (instead of repeated measures ANOVA and multilevel analyses), and found no significant relations of the intervention on job crafting, work engagement, and performance. Further, most of the effect sizes for Study 1 were medium to large (partial $\eta^2 = 0.04\text{--}0.07$, $p = 0.01\text{--}0.03$), and for Study 2 most were medium to large (partial $\eta^2 = 0.08\text{--}0.35$, $p = 0.00\text{--}0.03$). Results indicated that the intervention had a significant relationship with job crafting seeking challenges (Study 1; medium effect) and seeking resources (Study 2; large effect). The intervention effectively produced medium to large changes not only in reported job crafting behavior, but also in well-being and behavioral outcomes.

Third, in line with the literature on job crafting we also found some unfavorable (negative) and unexpected results regarding the dimension “reducing job demands,” but these were not related to the intervention. Although the changes in scores on reducing demands were significant according to the repeated measures analysis (Study 1), further mediation analyses found that the changes in other variables were unrelated to reducing demands; rather, the changes in well-being and performance were related to seeking challenges (Study 1) and seeking resources (Study 2; see step 2 of mediation). Further, results suggest that both specialists and nurses reduced their demands, but that it negatively influenced specialists’ well-being (i.e., work engagement and health) and increased their exhaustion, suggesting that reducing demands could be negative in some healthcare settings. However, past findings reveal that reducing (hindering) demands can lower exhaustion (Salmela-Aro et al., 2009) and can reduce negative strain (LePine et al., 2005). Individuals may reconsider reducing demands as a coping strategy if medical culture/managers/co-workers do not support it (e.g., job insecurity; Boswell, Olson-Buchanan, & Harris, 2013). In such contexts, when employees are struggling and need to step back from some responsibilities, reducing demands may help these individuals but also could result in negative feedback from their colleagues because it may be viewed as putting their workload onto others (Tims et al., 2015). Further, reducing demands is effortful and costs energy that these specialists may not have (left over) during organizational change, as witnessed by some of the declining significance in the control group. Since reducing demands negatively influences specialists’ outcomes, there may exist a hierarchical discrepancy in healthcare that does not encourage employees at the top to reduce demands or ask for help (e.g., personal issues). Future research is needed on the effects of job crafting, particularly reducing demands in different populations and organizations, to know when it helps or harms individuals and organizations.

4.2. Limitations and future research

Self-report measures can result in common method biases (Podsakoff, MacKenzie, & Podsakoff, 2012). Although we collected data on the objective count/numbers of the completed checklists, future studies should expand the use of objective measures to test the effectiveness of interventions. Everyone who completed the online survey in Study 1 received “tailored” (online) feedback (on the study-variables), including the control group. This may have had a positive effect on the control group, however individual feedback was not provided to the nurses in Study 2 and the results were still similar. Nielsen (2013) suggests it may be unethical to withhold treatments from at-risk populations. We conducted two quasi-experiments, which have some drawbacks (Cook & Campbell, 1979). Specifically, obtaining two completely randomized study designs was not feasible since organizations cannot force employees to participate. For practical and methodological reasons, the assignment of participants to experimental or control conditions was not completely random. Therefore, cross-contamination between individuals in the experimental and control groups was possible since hospital employees interact on a daily basis as this is necessary to ensure patient safety.

Although the original aim for Study 1 was to have a longitudinal design, participant attrition occurred leaving a small usable panel group that allowed no further calculations. In Study 2 unfortunately, 32 of the 60 nurses in the experimental groups and 26 of the 60 in the control groups did not complete any of the questionnaires, not allowing for data comparison between responders and non-responders. This happened although participation was encouraged and presented at weekly hospital meetings, and information was available on the medical specialists’ home page. Maybe only the more engaged individuals participated (Christian, Garza, & Slaughter, 2011) and future research could address this. Interestingly, in Study 1 there were more female medical specialists who participated in the experimental group and in Study 2 there were more nurses with higher levels of work experience who participated in the experimental group. It is unclear how these sample characteristics have affected the present findings, and therefore it is important that future research try to replicate the results among other underrepresented populations.

Further, given that we investigated the effect of the overall intervention, we cannot be exactly sure about what caused the positive associations with the intervention. Possibilities include: the workshop, the completion of one specific assignment, or factors other than the intervention itself (e.g., sharing with colleagues). Providing regular, short questionnaires to the participants during the intervention period (e.g., through smartphones) could be helpful to uncover what caused the favorable effects of the intervention and to rule-out alternative explanations. Also the alphas were quite low for seeking resources (Study 1) and reducing demands (Study 2), which might limit the implications of our findings. Generalizability across occupational groups is needed and tailoring the measures to specific populations may help to increase the alphas for the particular job crafting dimensions, as some items may not be relevant for a specific context.

One final limitation is that although it is possible that blends of job crafting behaviors co-exist, we tested the effects of each job

crafting dimension separately. We generally think that the context determines whether or not specific crafting behaviors will be used in combination, and if a specific combination is more beneficial than other ones. What we did show is that some crafting behaviors (alone) are more beneficial than others for a specific occupational group.

5. Conclusions

Our study is one of the first to test an individual-level job redesign intervention within healthcare organizations and to show that participants can not only learn to use job crafting in their daily work but that job crafting behavioral changes are associated with improvements in well-being and performance. Job crafting by seeking challenges (Study 1; specialists) and resources (Study 2; nurses) can enhance well-being and performance when individuals reflect, communicate, and actualize job crafting by enacting their crafting goals. Our intervention can be utilized and tailored to meet the unique needs of different organizations. We optimized the intervention structure and found a greater number of significant change effects for job crafting, well-being, and performance; while Van den Heuvel et al.'s (2015) similar intervention mainly found favorable effects on positive and negative affect and on job resources alone.

Future research should utilize experimental and longitudinal designs to explore the effectiveness of individual job crafting interventions for employees in other work populations and contexts. We suggest that job redesign interventions examine the role that contextual and individual factors play with regard to intervention effectiveness. To this end, organizations should encourage employees to craft their jobs and provide them with opportunities to “fit” their jobs to their strengths, skills, and working preferences. Every situation and individual is unique, requiring that job redesign interventions be adapted to meet the changing needs of today's organizations and individuals to create a “win-win” situation for all involved.

References

- Bakker, A. B. (2017). Strategic and proactive approaches to work engagement. *Organizational Dynamics*, 46, 67–75.
- Bakker, A. B., & Demerouti, E. (2007). The job demands–resources model: State of the art. *Journal of Managerial Psychology*, 22, 309–328. <http://dx.doi.org/10.1108/02683940710733115>.
- Bakker, A. B., & Demerouti, E. (2014). Job demands–resources theory. In P. Y. Chen, & C. L. Cooper (Vol. Eds.), *Work and wellbeing: Wellbeing: A complete reference guide*. Vol. 3. *Work and wellbeing: Wellbeing: A complete reference guide* (pp. 37–64). Chichester, UK: Wiley-Blackwell.
- Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22, 273–285.
- Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the job demands–resources model to predict burnout and performance. *Human Resource Management*, 43, 83–104.
- Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology*, 99, 274–284. <http://dx.doi.org/10.1037/0022-0663.99.2.274>.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182. <http://dx.doi.org/10.1037/0022-3514.51.6.1173>.
- Batalden, P. B., & Davidoff, F. (2007). What is “quality improvement” and can it transform healthcare? *Quality & Safety in Health Care*, 16, 2–3. <http://dx.doi.org/10.1136/qshc.2006.022046>.
- Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing practice*. Menlo Park, CA, US: Addison-Wesley.
- Benner, P., Hooper Kyriakidis, P., & Stannard, D. (2011). *Clinical wisdom and interventions in acute and critical care: A thinking-in-action approach*. New York, NY, US: Springer Publishing Company.
- Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2008). *What is job crafting and why does it matter? Theory-to-practice briefing*. Ann Arbor, MI: School of Business, University of Michigan Ross. Retrieved from <http://positiveorgs.bus.umich.edu/wp-content/uploads/What-is-Job-Crafting-and-Why-Does-it-Matter-1.pdf>.
- Biron, C., Karanika-Murray, M., & Copper, C. L. (Eds.). (2012). *Improving organizational interventions for stress and well-being: Addressing process and context*. London, UK: Routledge.
- Bond, F. W., Flaxman, P. E., & Bunce, D. (2008). The influence of psychological flexibility on work redesign: Mediated moderation of a work reorganization intervention. *Journal of Applied Psychology*, 3, 645–654. <http://dx.doi.org/10.1037/0021-9010.93.3.645>.
- Boswell, W. R., Olson-Buchanan, J. B., & Harris, T. B. (2013). I cannot afford to have a life: Employee adaptation to feelings of job insecurity. *Personnel Psychology*, 67, 887–915. <http://dx.doi.org/10.1111/peps.12061>.
- Bowling, A. (2005). Just one question: If one question works, why ask several? *Journal of Epidemiology & Community Health*, 59, 342–345. <http://dx.doi.org/10.1136/jech.2004.021204>.
- Briner, R. B., & Reynolds, S. (1999). The costs, benefits, and limitations of organizational level stress interventions. *Journal of Organizational Behavior*, 20, 647–664. [http://dx.doi.org/10.1002/\(SICI\)1099-1379\(199909\)20:5<647::AID-JOB919>3.0.CO;2-1](http://dx.doi.org/10.1002/(SICI)1099-1379(199909)20:5<647::AID-JOB919>3.0.CO;2-1).
- Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology*, 64, 89–136. <http://dx.doi.org/10.1111/j.1744-6570.2010.01203.x>.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Chicago, IL, US: Rand-McNally.
- Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology*, 95, 834–848. <http://dx.doi.org/10.1037/a0019364>.
- Demerouti, E. (2014). Design your own job through job crafting. *European Psychologist*, 19, 237–247. <http://dx.doi.org/10.1027/1016-9040/a000188>.
- Demerouti, E., & Bakker, A. B. (2014). Job crafting. In M. C. W. Peeters, J. De Jonge, & T. W. Taris (Eds.). *An introduction to contemporary work psychology* (pp. 414–433). Chichester, UK: Wiley-Blackwell.
- Demerouti, E., Bakker, A. B., & Halbesleben, J. (2015). Productive and counterproductive job crafting: A daily diary study. *Journal of Occupational Health Psychology*, 20, 457–469. <http://dx.doi.org/10.1037/a0039002>.
- Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. *European Journal of Psychological Assessment*, 18, 296–307. <http://dx.doi.org/10.1027//1015-5759.19.1.12>.
- Demerouti, E., Xanthopoulou, D., Tsaousis, I., & Bakker, A. B. (2014). Disentangling task and contextual performance: A multitrait-multimethod approach. *Journal of Personnel Psychology*, 13, 59–69.
- Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of Royal Statistical Society*, 39, 1–38. <http://dx.doi.org/10.2307/2984875>.
- Dollard, M., Le Blanc, P. M., & Cotton, S. J. (2008). Participatory action research as work stress intervention. In K. Näswall, J. Hellgren, & M. Sverke (Eds.). *The individual in the changing working life* (pp. 353–379). Cambridge, UK: Cambridge University Press.
- Dong, Y., & Peng, C. Y. J. (2013). Principled missing data methods for researchers. *SpringerPlus*, 222, 1–17. <http://dx.doi.org/10.1186/2193-1801-2-222>.
- Erdogan, B., & Bauer, T. N. (2005). Enhancing career benefits of proactive personality: The role of fit with jobs and organizations. *Personnel Psychology*, 58, 859–891.

- <http://dx.doi.org/10.1111/j.1744-6570.2005.00772.x>.
- Garson, G. D. (2015). *Missing values analysis & data imputation*. North Carolina State University, Asheboro: Statistical Associates Publishing.
- Ghitulescu, B. E. (2007). Shaping tasks and relationships at work: Examining the antecedents and consequences of employee job crafting (Doctoral dissertation). Retrieved from http://etd.library.pitt.edu/ETD/available/etd-12112006-131255/unrestricted/ghitulescu_etd.pdf.
- Goodman, S. A., & Svyantec, D. J. (1999). Person-organization fit and contextual performance: Do shared values matter? *Journal of Vocational Behavior*, 55, 254–275. <http://dx.doi.org/10.1006/jvbe.1998.1682>.
- Gordon, H. J., Demerouti, E., Le Blanc, P. M., & Bipp, T. (2015). Job crafting and performance of Dutch and American Health Care Professionals. *Journal of Personnel Psychology*, 14, 192–202.
- Gorgievski, M. J., Bakker, A. B., & Schaufeli, W. B. (2010). Work engagement and workaholism: Comparing the self-employed and salaried employees. *The Journal of Positive Psychology*, 5, 83–96.
- Grant, A. M., & Parker, S. K. (2009). Redesigning work design theories: The rise of relational and proactive perspectives. *The Academy of Management Annals*, 3, 317–375. <http://dx.doi.org/10.1080/19416520903047327>.
- Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and independent contexts. *Academy of Management Journal*, 50, 327–347. <http://dx.doi.org/10.5465/AMJ.2007.24634438>.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Decision Processes*, 16, 250–279. [http://dx.doi.org/10.1016/0030-5073\(76\)90016-7](http://dx.doi.org/10.1016/0030-5073(76)90016-7).
- Harter, J. K., & Blacksmith, N. (2010). Employee engagement and the psychology of joining, staying in, and leaving organizations. In P. A. Linley, S. Harrington, & N. Garcea (Eds.). *Oxford handbook of positive psychology and work* (pp. 121–130). Oxford, UK: Oxford University Press.
- Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work*. New York: John Wiley & Sons.
- Holman, D. J., & Axtell, C. M. (2016). Can job redesign interventions influence a broad range of employee outcomes by changing multiple job characteristics? A quasi-experimental study. *Journal of Occupational Health Psychology*, 21, 284–295.
- Hornung, S., Rousseau, D. M., Glaser, J., Angerer, P., & Weigl, M. (2010). Beyond top-down and bottom-up work redesign: Customizing job content through idiosyncratic deals. *Journal of Organizational Behavior*, 31, 187–215. <http://dx.doi.org/10.1002/job.625>.
- Hu, Q., Schaufeli, W. B., Hessen, D. J., Salanova, M., Taris, T. W., Hakanen, J., & Shimazu, A. (2014). “East is East and West is West and never the twain shall meet”: Work engagement and workaholism across eastern and western cultures. *Journal of Behavioral and Social Science*, 1, 6–24 (ISSN: 2375-8899).
- Koltz, A. C., & Bolino, M. C. (2013). Citizenship and counterproductive work behavior: A moral licensing view. *Academy of Management Review*, 38, 292–306. <http://dx.doi.org/10.5465/amr.2011.0109>.
- Le Blanc, P. M., Hox, J. J., Schaufeli, W. B., Taris, T. W., & Peeters, M. C. W. (2007). Take care! The evaluation of a team-based burnout intervention program for oncology care providers. *Journal of Applied Psychology*, 92, 213–227. <http://dx.doi.org/10.1037/0021-9010.92.1.213>.
- Leana, C. R., Applebaum, E., & Shevchuk, I. (2009). Work processes and quality care in childhood classrooms. *The Academy of Management Journal*, 52, 1169–1192. <http://dx.doi.org/10.5465/AMJ.2009.47084651>.
- LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*, 48, 764–775. <http://dx.doi.org/10.5465/AMJ.2005.18803921>.
- Lyons, P. (2008). The crafting of jobs and individual differences. *Journal of Business and Psychology*, 23, 25–36. <http://dx.doi.org/10.1007/s10869-008-9080-2>.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397–422. <http://dx.doi.org/10.1146/annurev.psych.52.1.397>.
- Metselaar, E. E. (1997). *Assessing the willingness to change: Construction and validation of the DINAMO*. NL: Free University of Amsterdam (Unpublished doctoral dissertation).
- Meyers, M. C., van Woerkom, M., & Bakker, A. B. (2013). The added value of the positive: A literature review on positive psychology interventions in organizations. *European Journal of Work and Organizational Psychology*, 22, 618–632. <http://dx.doi.org/10.1080/1359432X.2012.694689>.
- Nielsen, K. (2013). How can we make organizational interventions work? Employees and line managers as actively crafting interventions. *Human Relations*, 66, 1029–1050. <http://dx.doi.org/10.1177/0018726713477164>.
- Nielsen, K., Randall, R., Holten, A. L., & Rial-Gonzales, E. (2010). Conducting organizational-level occupational health interventions: What works? *Work and Stress*, 22, 16–32. <http://dx.doi.org/10.1080/02678373.2010.515393>.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY, US: McGraw-Hill.
- Oldham, G. R., & Hackman, J. R. (2010). Not what it was and not what it will be: The future of job design research. *Journal of Organizational Research*, 31, 463–479. <http://dx.doi.org/10.1002/job.678>.
- Peng, C. Y. J., Harwell, M., Liou, S. M., & Ehman, L. H. (2006). Advances in missing data methods and implications for educational research. In S. S. Swailowsky (Ed.). *Real data analysis* (pp. 31–78). Charlotte, NC: Information Age Pub.
- Peterson, U., Bergström, G., Demerouti, E., Gustavsson, P., Åsberg, M., & Nygren, A. (2011). Burnout levels and self-rated health prospectively predict future long-term sickness absence: A study among female health professionals. *Journal of Occupational and Environmental Medicine*, 53, 788–793. <http://dx.doi.org/10.1097/JOM.0b013e318222b1dc>.
- Petrou, P., Demerouti, E., Peeters, M. C. W., Schaufeli, W. B., & Hetland, J. (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behavior*, 33, 1120–1141. <http://dx.doi.org/10.1002/job.1783>.
- Petrou, P., Demerouti, E., & Schaufeli, W. B. (2015). Job crafting in changing organizations: Antecedents and implications for exhaustion and performance. *Journal of Occupational Health Psychology*, 20, 470–480. <http://dx.doi.org/10.1037/a0039003>.
- Pignata, S., Biron, C., & Dollard, M. F. (2014). Managing psychosocial risks in the workplace: Prevention and intervention. In M. Peeters, J. de Jonge, & T. W. Taris (Eds.). *People at work: An introduction to contemporary work psychology* (pp. 393–413). Hoboken, NJ: Wiley Blackwell.
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 39–69. <http://dx.doi.org/10.1146/annurev-psych-120710-100452>.
- Preacher, K. J., & Leonardelli, G. (2003). Calculation for the Sobel test: An interactive calculation tool for mediation tests. Retrieved from <http://quantpsy.org/sobel/sobel.htm>.
- Ramsay, H. (1977). Cycles of control: Worker participation in sociological and historical perspective. *Sociology*, 11, 481–506. <http://dx.doi.org/10.1177/003803857701100304>.
- Rasbash, J., Steele, F., Browne, W. J., & Goldstein, H. (2009). *User's guide to MLwiN, version 2.1*. Bristol, UK: Centre for Multilevel Modeling, University of Bristol.
- Salmela-Aro, K., Tolvanen, A., & Nurmi, J. E. (2009). Achievement strategies during university studies predict early career burnout and engagement. *Journal of Vocational Behavior*, 75, 162–172. <http://dx.doi.org/10.1016/j.jvb.2009.03.009>.
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and work engagement: A multi-sample study. *Journal of Organizational Behavior*, 25, 293–315. <http://dx.doi.org/10.1002/job.248>.
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a brief questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66, 701–716. <http://dx.doi.org/10.1177/0013164405282471>.
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist*, 60, 410–421. <http://dx.doi.org/10.1037/0003-066X.60.5.410>.
- Sullivan, M., & Karlsson, J. (1998). The Swedish SF-36 Health Survey III. Evaluation of criteria-based validity: Results from normative population. *Journal of Clinical Epidemiology*, 51, 1105–1113. [http://dx.doi.org/10.1016/S0895-4356\(98\)00102-4](http://dx.doi.org/10.1016/S0895-4356(98)00102-4).
- Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *South African Journal of Industrial Psychology*, 36, 1–9. <http://dx.doi.org/10.4102/sajip.v36i2.841>.
- Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behavior*, 80, 173–186. <http://dx.doi.org/10.1016/j.jvb.2011.05.009>.
- Tims, M., Bakker, A. B., & Derks, D. (2013). The impact of job crafting on job demands and resources, and well-being. *Journal of Occupational Health Psychology*, 18, 230–240. <http://dx.doi.org/10.1037/a0032141>.

- Tims, M., Bakker, A. B., & Derks, D. (2015). Job crafting and performance: A longitudinal study. *European Journal of Work and Organizational Psychology, 24*, 914–928. <http://dx.doi.org/10.1080/1359432X.2014.969245>.
- Tims, M., Bakker, A. B., & Derks, D. (2016). Job crafting and its relationship with person-job fit and meaningfulness: A three-wave study. *Journal of Vocational Behavior, 92*, 44–53. <http://dx.doi.org/10.1016/j.jvb.2015.11.007>.
- Trist, E. L., Higgin, G. W., Murray, H., & Pollock, A. B. (2013). *Organizational choice*. Routledge.
- Van den Heuvel, M., Demerouti, E., & Peeters, M. C. W. (2015). The job crafting intervention: Effects on job resources, self-efficacy, and affective well-being. *Journal of Occupational and Organizational Psychology, 88*, 511–532. <http://dx.doi.org/10.1111/joop.12128>.
- Van den Heuvel, M. E., Demerouti, E., Bakker, A. B., & Schaufeli, W. B. (2013). Adapting to change: The value of change information and meaning-making. *Journal of Vocational Behavior, 83*, 11–21. <http://dx.doi.org/10.1016/j.jvb.2013.02.004>.
- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management, 17*, 601–617. <http://dx.doi.org/10.1177/014920639101700305>.
- Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review, 26*, 179–201. <http://dx.doi.org/10.5465/AMR.2001.4378011>.
- Youngblut, J. M., & Casper, G. R. (1993). Single-item indicators in nursing research. *Research in Nursing and Health, 16*, 459–465. <http://dx.doi.org/10.1002/nur.4770160610>.