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The effects of a job crafting intervention on the success of an organizational change effort in a blue-collar work environment

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The current study in a blue-collar context investigates whether a job crafting intervention may facilitate employee adaptation to organizational change, while decreasing exhaustion and increasing positive attitudes towards change and safety behaviour. It was hypothesized that the intervention would increase job crafting behaviours (i.e., seeking resources, seeking challenges, and optimizing demands) resulting in decreased employee exhaustion, and improved change attitudes and employee safety behaviour (i.e., adherence to organization’s standard operating procedures). The quasi-experimental study revealed that, after the intervention (consisting of a workshop, four weeks of job crafting implementation, and an evaluative session), employees reported an increase in two of the three trained job crafting strategies (i.e., seeking challenges, optimizing demands). Moreover, those who participated in the intervention reported lower levels of exhaustion, improved cognitive and behavioural attitudes towards change, and increased safety behaviour. The intervention was found to improve the affective, cognitive, and behavioural components of a change attitude due to increases in seeking challenges. Results were similar after controlling for quality information and leadership behaviour during the change. It is concluded that a job crafting intervention and resulting job crafting behaviour can be an effective way to achieve successful adaptation to organizational change.

Organizational change is a double-edged sword, as it is required for organizational viability (Day et al., 2017) but it is found to impact the workforce negatively and finds resistance (Oreg, 2006). Not surprisingly, planned organizational change often results in failure (Werkman, 2009). Studies have indicated that multiple means may lead to successful organizational change (Heyden, Fourné, Koene, Werkman, & Ansari, 2017; Werkman, 2009). All these different means have one aspect in common: For change to be implemented (e.g., for work routines to be changed), managers must rely on individual employees and their proactivity and adaptability (Ghitulescu, 2013).

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Recent evidence suggests that job crafting strategies (i.e., seeking resources, seeking challenges, and reducing demands) facilitate the emergence of new work roles that help employees retain their well-being (i.e., high work engagement and low exhaustion) during cutback-related or regular organizational changes (Petrou, Demerouti, & Xanthopoulou, 2017). Moreover, two studies showed that an intervention that stimulates job crafting behaviour has been effective in increasing change-related outcomes (i.e., openness to change, adaptive performance; Demerouti et al., 2017), task and contextual performance, as well as change behaviour (Gordon et al., 2018). Empirical evidence on the effectiveness of the job crafting intervention in improving attitude towards change and adaptive behaviour is essential, since attitudes are the precursors of behaviour (Fishbein & Ajzen, 2012) and workers need to be increasingly adaptable to uncertainty in order to operate effectively and safe in changing environments (Pulakos, Arad, Donovan, & Plamondon, 2000). However, such evidence has been limited so far. Also, training employees to apply the job crafting strategy of reducing demands was found to result in unfavourable change outcomes (Demerouti et al., 2017). Finally, it is unclear whether the job crafting intervention can also be effective for blue-collar work (e.g., in the retail sector), since all such interventions so far concerned white-collar employees (e.g., public sector employees, nurses).

This study takes place in the logistics departments of two stores of a large retail organization that were unsuccessful in implementing the so-called standard operating procedures (SOP) to manage and safeguard employee and customer safety during the stocking process (e.g., keep distance from a reach truck, do not answer the company phone while driving a reach truck, follow the ‘one-way roads’, leave workplace clean, place products on the shelves according to guidelines, address colleagues using incorrect work method). Although the organization promoted the implementation of SOP and informed employees (by organizing special team meetings), explained and monitored the process, employees did not adhere to the procedure and preferred to go back to the old way of doing their work. This is known as the adoption–implementation gap (Weiner, Lewis, & Linnan, 2009). Klein and Sorra (1996) proposed that, even in the context of a strong implementation climate, innovation use depends on the innovation’s fit with the targeted employees’ values.

We propose that in order to successfully implement a change, next to informing or monitoring employees, organizations need to stimulate employees to craft the proposed change such that it fits their preferences and daily work. Specifically, we test whether job crafting (i.e., seeking resources, seeking challenges, and optimizing – instead of reducing – job demands; Demerouti & Peeters, 2018) can be induced by an intervention within a blue-collar context and whether job crafting behaviour may decrease work-related exhaustion and increase change attitude and employee adaptive or, more specifically, safety behaviour, over and above the role of quality information and leaders' change-oriented behaviour. By doing this, we examine whether the effect of the intervention (initiated by the researchers) and of crafting behaviours (exhibited by the employees) on outcomes still persists even after controlling for two contextual factors at the group level (i.e., leadership behaviour) and the organizational level (i.e., quality information) that are found to influence employee change behaviour (Petrou, Demerouti, & Schaufeli, 2018).

By addressing this goal, our study contributes to the literature in the following ways. First, it adds to the literature on safety at work by suggesting a way through which organizations may stimulate employees to adhere to safety procedures and carry out work in a safe manner (i.e., safety behaviour; Neal, Griffin & Hart, 2000). Interventions aiming to change the work environment directly have been found to promote safety compliance (e.g., Hammer et al., 2016). Our approach adds to these attempts since it aims to train
employees themselves to change their work environment and find the resources needed to adapt to change and comply with safety procedures. Second, our study contributes to the job crafting literature by testing the effectiveness of an intervention to stimulate optimizing demands next to seeking resources and challenges in order to improve safety behaviour, change attitude, and exhaustion within a blue-collar context. Hence, we add to previous studies on job crafting interventions (for a meta-analysis, Oprea, Barzin, Virgä, Iliescu, & Rusu, 2019) by investigating whether the strategy of optimizing job demands – that is considered more favourable than that of reducing demands (Demerouti, & Peeters, 2018) – may be promoted through training and facilitate employees to adapt during change. Also, uncovering the effectiveness of the job crafting intervention in a blue-collar context is essential as, compared to white-collar workers, blue-collar workers experience different opportunities for job crafting (Berg et al., 2010), their context is characterized by poorer working conditions than that of white-collar workers (Karasek & Theorell, 1990), and the majority of their tasks are carried out in a standardized fashion (Nielsen & Abildgaard, 2012). Finally, we contribute to the change management literature by investigating job crafting as an alternative, bottom-up strategy that may facilitate adaptation to change, over and above more traditional top-down approaches that emphasize the role of the organization and/or the leader in the change process (Vakola & Petrou, 2018). Given the role of employees’ resistance to the high rate of change failure (Oreg, Vakola, & Armenakis, 2011), we investigate whether training employees’ themselves to adopt specific job crafting behaviours may lead to successful organizational change over and above the role of leadership and quality information provided by the organization during change.

**Triggering job crafting strategies through an intervention**

Job crafting represents a bottom-up approach to job redesign where employees alter their jobs to make them fit to their preferences and find meaning. Wrzesniewski and Dutton (2001) suggest that individuals craft their jobs by altering their task boundaries, the relationships at work, and how they think about their work. In this study, we conceptualize job crafting from the perspective of job demands–resources (JD-R) theory (Bakker & Demerouti, 2017; Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Accordingly, job crafting concerns changes employees make to balance their job demands and job resources with their personal abilities and needs to create or restore their person–job fit (Tims & Bakker, 2010). Job demands refer to aspects of the job that require effort and, therefore, are associated with psychophysiological costs, whereas job resources refer to job aspects that facilitate dealing with job demands, goal accomplishment, and growth (Demerouti et al., 2001). Specifically, individuals craft their job by seeking job resources (e.g., seeking feedback, maximizing autonomy) to deal with job demands and to achieve goals, by seeking challenging demands (e.g., asking for more responsibilities, seeking more tasks) to maintain motivation and avoid boredom, by reducing hindering demands (e.g., task avoidance, reducing task complexity) to protect their health and energy, and by optimizing demands to surpass inefficient working methods (e.g., simplify work processes; Demerouti & Peeters, 2018; Petrou, Demerouti, Peeters, Schaufeli & Hetland, 2012). Systematic evidence suggests that reducing job demands is an unfavourable job crafting strategy since it relates to reduced work engagement and job performance (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). In contrast, optimizing demands associates positively to work engagement (Demerouti & Peeters, 2018) and to simulator training performance among pilots.
(Demerouti, Veldhuis, Coombes, & Hunter, 2018). Hence, in this study we focus on seeking resources, seeking challenges, and optimizing job demands.

In meta-analytic studies, job crafting – and particularly seeking resources and challenges – was associated with positive outcomes, including work engagement and job performance (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). These results have encouraged the development of interventions to motivate employees to engage in job crafting. Meta-analytic evidence of 14 job crafting interventions (Oprea et al., 2019) confirmed that such interventions significantly increased overall job crafting, seeking challenges, and reducing demands justifying that they are effective to trigger the trained behaviour. Moreover, the meta-analysis showed that the interventions were effective in improving work engagement and contextual performance, but less effective in improving task performance and adaptive performance although the latter result was based on a small number of samples. The interventions were more effective when participants formed concrete plans that included both organizational and personal objectives. Finally, Oprea and colleagues noted that job crafting interventions increase performance-related outcomes by encouraging adjustment of job characteristics, which is different from the mechanism used in training (i.e., acquiring knowledge, learning new behaviours) and in goal-setting (i.e., focus, invest effort, persist).

Our intervention integrates the insights of Oprea et al. (2019) to increase its effectiveness. It builds on the intervention of van den Heuvel et al. (2015), which was successfully adapted by Gordon et al. (2018) and Dubbelt, Demerouti, and Rispens (2019), and even applied to austerity-led organizational changes by Demerouti et al. (2017). This job crafting intervention was designed based on JD-R theory (Bakker & Demerouti, 2017), experiential learning theory (Kolb, Boyatzis, & Mainemelis, 2000), and goal-setting theory (Latham & Locke, 2007). JD-R theory suggests that two processes take place at work. Job demands initiate the health impairment process because they represent requirements that individuals have to fulfil by investing effort. If demands are overwhelming or the exposure is prolonged, effort investment consumes employees’ resources and can lead to exhaustion. Job resources initiate the motivational process because they facilitate goal accomplishment and therefore increase the willingness to invest effort. Moreover, job resources buffer the impact of job demands on exhaustion, whereas job demands strengthen the motivating role of job resources. Seeking resources and challenges and optimizing demands enhance the pool of resources, and help deal with job demands by optimizing their burden.

To stimulate learning and facilitate behaviour change, the intervention builds on participants’ past experiences with job crafting (Kolb et al., 2000). The intervention incorporates the four stages that are important in the learning process (Kolb et al., 2000) to encourage employees to actively apply job crafting (see Table 1). Learning starts with concrete experiences with the behaviour, which are followed by reflecting upon this behaviour (Sumsion & Fleet, 1996). After reflection, individuals reach the third stage of learning, where they have abstract ideas about the new behaviour, and acknowledge that implementation can be beneficial (Kolb et al., 2000). During this stage, underscoring the value of the behaviour to increase individuals’ willingness to invest energy and time in implementing it is important (Nielsen, Randall, Brenner, & Albertsen, 2009). During the last stage, individuals actively test the behaviour to create new experiences (Kolb et al., 2000).

To stimulate the implementation process, goal-setting is also important (Arneson & Ekberg, 2005). According to goal-setting theory, setting explicit goals improves performance at any given task. Individuals with clear goals appear more able to direct attention and effort towards goal-relevant activities and away from goal-irrelevant
activities, demonstrating a greater capacity for self-regulation and more enthusiasm (Latham & Locke, 2007). Goal clarity makes individuals less susceptible to disappointment and frustration, more persistent and more able to discover efficient strategies and reach mastery experiences (Locke & Latham, 2002). Therefore, during the intervention participants formulate specific, measurable, attainable, realistic, and timely (SMART) job crafting goals in a so-called personal crafting plan (PCP) to be fulfilled the weeks after the workshop. Whereas the PCP of Gordon et al.’s (2018) study included seeking resources (week 1), seeking challenges (week 2), and reducing demands (week 3), Demerouti et al.’s (2017) PCP included seeking resources (week 1), reducing demands (week 2), and seeking resources (week 3). Importantly, next to SMART, the crafting goals had to be advantageous for both the individual and the organization, as suggested by Oprea et al. (2019).

Due to the theoretical reasoning integrated in the intervention, we suggest that the intervention will be effective to stimulate individuals to adjust and optimize their job demands and resources, that is, to craft their job. This is in line with empirical evidence of intervention studies that share the same theoretical background showing that the intervention improved behaviours of seeking resources (Dubbelt et al., 2019; Gordon et al., 2018), seeking challenges (Gordon et al., 2018), and reducing demands (Demerouti

| Steps | Aspects of the intervention that reflect the experiential learning theory |
|-------|---------------------------------------------------------------------|
| Step 1: Concrete experiences | • Interviews: Providing real-life examples of job demands, job resources, and job crafting from interviews conducted with employees prior to the workshop<br>• Job analysis exercise: Every employee analysed their own job demands and job resources during the workshop<br>• Situated learning narratives (SELN; Benner, 1984) exercise: Every employee reported a job crafting experience, in which they showed positive past behaviour in problem-solving situations (i.e., create a better fit with the job, and remain healthy and adaptive at work) |
| Step 2: Reflection | • SELN exercise further encouraged employees to think about how that behaviour may be helpful in attaining future goals (such as safety behaviours). In a group context, they stimulated others’ thinking about problem-solving behaviours |
| Step 3: Abstract concepts | • Demonstrating the value of job crafting for work-related outcomes, via job demands-resources theory (Demerouti et al., 2001) |
| Step 4: Creating new experiences | • Goal-setting: Setting four specific, measurable, acceptable, realistic, and time-bound (SMART) goals (Doran, 1981) for the four weeks after the intervention (i.e., week 1: seeking resources; week 2: optimizing demands; week 3: seeking challenges; week 4: seeking resources) to practise the three job crafting strategies<br>• Encourage participants to think about possible facilitating factors and obstacles for their goals in order to think ahead about how to deal with obstacles and how to optimally use facilitators<br>• Weekly reminders were sent to encourage goal achievement (e.g., Fjeldsoe, Marshall, & Miller, 2009) and commitment to the intervention<br>• Reflection meeting: by evaluating the success and failures in practising the learned behaviour, participants discussed how they could continue crafting their job

Table 1. Overview of the Intervention
et al., 2017; Dubbelt et al., 2019; Gordon et al., 2018). Only the study of Van den Heuvel et al. (2015) did not find a multivariate effect of the intervention on job crafting behaviour among police employees. Moreover, we expect that the intervention will effectively stimulate job crafting behaviour even in a blue-collar context, which can also be characterized by job demands and resources, and where job crafting has been found to be relevant (Nielsen & Abildgaard, 2012). Thus:

**Hypothesis 1.** Employees in the intervention group will report increased levels of (1a) seeking resources, (1b) seeking challenges, and (1c) optimizing demands after the intervention.

**Job crafting and exhaustion**

Seeking resources and challenges and optimizing demands are expected to improve the pool of job resources and optimize the burden of job demands. According to JD-R theory (Bakker & Demerouti, 2017), these conditions maximize motivation and minimize energy consumption and, consequently, reduce feelings of exhaustion (i.e., feeling of depleted energy and being overextended by the demands of one’s work). By gaining resources or by making work more challenging and meaningful, employees are filled with resources. These resources help them deal effectively with the demands they face during change implementation, preventing high levels of exhaustion. By optimizing instead of reducing job demands, employees reserve energy, thus avoiding energy depletion. Moreover, they avoid an energy-consuming process, where reducing job demands and exhaustion reinforce each other over time (Petrou, Demerouti & Schaufeli, 2015). In line with this reasoning, Tims, Bakker, and Derks (2013) found that crafting job resources and challenging demands related negatively to burnout symptoms, of which exhaustion is a core component (Demerouti et al., 2001). These authors attributed these findings to individuals feeling in control during job crafting or to the changes in the perception of job demands and resources as a result of job crafting. Similarly, Demerouti, Bakker, and Halbesleben (2015) found that seeking resources related to higher reported autonomy, whereas reducing demands to lower perceived work pressure. Thus, an intervention that triggers employees to increase job crafting behaviours will lead to decreases in experienced exhaustion due to changes in job demands and resources.

**Hypothesis 2.** Employees in the intervention group will report decreased levels of exhaustion after the intervention.

**Job crafting and change attitude**

Dunham et al. (1989) argued that one’s change attitude is composed of an affective (feelings), a cognitive (thoughts), and a behavioural component. Individuals’ attitudes to organizational change are of critical importance for change success (Oreg et al., 2011; Vakola & Petrou, 2018) as organizations implement and adopt long-term changes through their members (Jones, Jimmieson, & Griffiths, 2005). We argue that a job crafting intervention can provide a means to yield a more positive change attitude.

First, Vakola and Nikolaou (2005) argued that if employees are committed to their organization, they are more willing to put effort into a change project and, therefore, are
more likely to develop more positive attitudes towards organizational change. Job crafting behaviours may result in increased organizational commitment since, through crafting, employees may balance challenges and demands to find a better fit (Tims et al., 2016). Second, job crafting can trigger positive change attitudes through the meaning-making process that it stimulates. Finding meaning implies that individuals are able to understand what happens around them and link changes in their work environment to their own personal goals and values helping them to remain resilient. Tims et al. (2016) found that when employees increase job resources and challenges, they are likely to improve their person–job fit and, consequently, their experienced work meaningfulness. In addition, whether change recipients perceive the changes as beneficial or harmful plays an important role in their decision to support or resist change (Oreg et al., 2011) and to maintain this attitude throughout the change (Vakola, 2016). Since change recipients’ perceived impact of the change is a key determinant for recipient attitudes towards the change, job crafting can help employees to regain control over their jobs and find a better fit between their needs and the job (Walk & Handy, 2018). By being able to act on the perceived impact of change, individuals will develop more positive attitudes towards it. Hence, we hypothesized:

Hypothesis 3. Employees in the intervention group will report more positive (3a) affective, (3b) cognitive, and (3c) behavioural change attitude after the intervention.

Job crafting and safety behaviour

We focus on safety behaviour as a specific type of performance which incorporates two dimensions: compliance and participation (Neal et al., 2000). Safety compliance involves adhering to safety procedures and regulations and carrying out work in a safe manner. Safety participation involves helping co-workers, promoting the safety programme, and putting effort into improving safety within the workplace. These behaviours could be framed as adaptive performance that entails the adoption and adherence to organizational changes (e.g., new working methods or routines) (Pulakos et al., 2000). Both adaptive and safety behaviour involve discretionary and compliant behaviours (e.g., Griffin & Neal, 2000). Time and production pressure make it challenging for individuals to dedicate time and cognitive resources to safety efforts (Christian et al., 2009; Curcuruto, Parker & Griffin, 2019).

Job crafting is expected to stimulate safety behaviour for several reasons. First, in line with JD-R theory (Bakker & Demerouti, 2017), job crafting improves the pool of job resources and (challenging) demands, allowing optimal functioning and adaptation as the individual has a surplus of resources to invest in the effortful process of adaptation to change aimed at promoting safety behaviour. Second, as job crafting means proactive adjustment of one’s job and high involvement in role breadth (Wrzesniewski & Dutton, 2001), it also indicates that people act on their own initiative instead of external pressures. As the outcomes of safety actions are uncertain and may occur in the long rather than the short term, there is a need for a strong internal force driving safety behaviour (Curcuruto et al., 2019). According to Curcuruto et al., recognizing personal accountability for one’s job and broadening one’s role through job crafting is expected to make individuals more inclined to see safety initiatives as part of their role and to engage in discretionary actions aiming at improving workplace safety behaviour. Research supports that job crafting is a means to adapt to (and survive) organizational change (Demerouti et al., 2017;
Ghitulescu, 2013; Petrou et al., 2015, 2018), whereas proactivity is found to predict higher safety behaviour (Curcuruto et al., 2019). Therefore, we expect:

**Hypothesis 4.** Employees in the intervention group will report increased levels of safety behaviour after the intervention.

Taking Hypotheses 1-4 together, it is suggested that the job crafting intervention will result in increases in the specific job crafting strategies that, in turn, will improve employee outcomes during organizational changes. Specifically, the group (intervention vs. control) × time (pre- vs. post-test) interaction effect will have an indirect effect on exhaustion, change attitude, and safety behaviour via its effect on the job crafting behaviours. Namely:

**Hypothesis 5.** The intervention will relate to increases in job crafting (i.e., seeking resources, seeking challenges, and optimizing demands) over time that, in turn, will relate negatively to changes in (a) exhaustion and positively to changes in (b) affective, (c) cognitive, (d) behavioural change attitude, and (e) safety behaviour.

**Quality information and leader’s change-oriented behaviour**

Providing timely, useful, adequate, and accurate top-down information in a change context increases acceptance, openness, readiness, and commitment to change (Bordia, Hobman, Jones, Gallois, & Callan, 2004; Oreg et al., 2011), shapes employees’ intentions to support change (Jimmieson, Peach, & White, 2008), reduces feelings of uncertainty and stress during change (Wanberg & Banas, 2000), and maintains positive reaction to change (Vakola, 2016). Failure to provide sufficient information may result in rumours that exaggerate the negative aspects of change, which results in resistance to change (Bordia et al., 2004; Reichers, Wanous, & Austin, 1997). Apart from quality information, leadership behaviours concerned with initiating, encouraging, and facilitating change are critical determinants of employee willingness to embrace change (Oreg, 2006; Yukl, 2012), facilitate emergent change processes (Yukl, 2012), impact followers’ innovation implementation behaviour (Michaelis, Stegmaier, & Sonntag, 2010), and create a positive climate for change adoption that affects change and innovative behaviour (Kavanagh & Ashkanasy, 2006).

In line with JD-R theory (Bakker & Demerouti, 2017), the availability of resources like quality information and facilitating leadership behaviour will enable employees to adapt during change. However, when these resources are absent, employees will suffer. Given the central role that organizations and leaders play for employees’ adaptation to change, it is important to show that a job crafting intervention may be favourable for employees during changing times, over and above the role of quality information employees receive with regard to the change and their leaders’ change-oriented behaviours. We argue that job crafting may prevent exhaustion and may promote employees’ positive attitude to change and safety behaviour over and above the role of organizations and leaders. This is because job crafting promotes self-initiated actions to achieve person–job fit (Tims et al., 2016) that may be relevant irrespective of whether organizations and leaders are supportive of the change. Thus:
Hypothesis 6. The effect of the intervention will remain significant even after controlling for quality information and leaders’ change-oriented behaviour.

Method

Research design and procedure
This study was conducted in the logistics departments of two stores of a large, multinational retail organization, which was unsuccessful in implementing the so-called SOP aiming at ensuring employee and customer safety during and after the stocking process. The two stores were in different geographical areas. One of the stores was assigned to the intervention condition and the other to the control condition. In this way, in both (intervention and control) groups organizational culture and tasks overlapped and the same safety behaviours could be assessed. In both stores, employees were not adhering to the changes that were implemented to ensure workplace safety. As revealed by the pre-intervention interviews, this was attributed to the fact that the implementation of the change increased employees’ (perceived) workload. As a result, employees either did not change at all, or those, who initially (partially) changed, fell back into their old working routines. By using a physically separated control group, cross-contamination was prevented (Demerouti et al., 2017). Participants of both groups (i.e., stores) were assessed twice: before the job crafting training workshop (T1) took place and eight weeks after the workshop had taken place (T2). In terms of Cook and Campbell (1979), our design is a non-equivalent quasi-experiment with no-treatment control group. Hence, we could not control participants’ allocation to groups through randomization, while we could not exclude that the two groups may differ prior to the evaluation process (Wang, 2002).

The intervention consisted of a workshop, four consecutive weeks of self-chosen job crafting assignments and an evaluation session. Before the workshop took place, structured interviews were conducted with random employees to distil key information on relevant existing job crafting behaviours, job demands, job resources, and the experience of change. This information was used to tailor the workshop. Four identical 3-hr workshops were held to ensure participation. Each workshop consisted of about 15–20 employees and was provided by the same trainer, that is, the second author, who also conducted the interviews. Participants of the intervention group attended the workshops and evaluation session during work hours. Moreover, each workshop was attended by at least one team manager and an HR representative to help employees with the various exercises.

The workshop consisted of three different parts: theoretical background, work analysis, and a PCP. All participants were provided with an information booklet with a questionnaire for the baseline measurement, all information as presented in the workshop, and a PCP booklet. Before the start of the presentation, participants were asked but not obliged to complete the pre-measure (T1). At the end of the workshop, employees included their SMART goals for the PCP. These goals were aimed at the job crafting dimensions: (week 1) seeking resources, (week 2) optimizing demands, (week 3) seeking challenges, and (week 4) seeking resources. Although the training was not explicitly designed to improve safety behaviour but to take control over one’s job, we primed individuals to formulate goals related to demands and resources relevant to the implementation of SOP by providing them in the booklet examples of crafting goals that
related to safety behavior. The PCP included seeking resources twice because this dimension has favorable effects during change (Petrou et al., 2012). To ensure participation, weekly reminder e-mails were sent. These e-mails were aimed at reminding participants to follow their PCP. Eight weeks after the workshop, a second, evaluative, session was held. This session was held during the department’s team meetings, making attendance mandatory. Before this session, participants were asked to fill out the post-measure (T2). During this session, the overall initial results (T1 measurement) were discussed and experiences were exchanged to promote future job crafting behavior. All training sessions and additional contact were standardized. Checklists were available for the trainer to check whether everything was discussed. Moreover, a timetable was maintained during each training session. This standardization process was conducted in order to actively maintain intervention fidelity (van Zyl et al., 2019). The researchers sent the pre- and post-measurement questionnaires and one reminder per measure to the control group, who filled them out in their own time and returned the completed questionnaires to the managers.

Participants
The group that attended the job crafting workshop and completed the pre-measure questionnaire (T1) was composed of 65 individuals, with a mean age of 45 (SD = 12.10) years (for an overview, see the CONSORT Flow Diagram, Figure 1). Fifty-four per cent were men and 46% were women. Most (63.1%) participants had graduated from secondary vocational education or lower, 26.1% had a higher education degree, and 10.8% had a university degree. Their work tenure was on average 7 (SD = 6.8) years, and they worked an average of 20.52 (SD = 9.3) hours per week, with 73.4% working <20 hr per week. At the second (T2) measurement, 53 employees who initially participated at T1 and completed the intervention took part. Independent-sample t-tests showed that the two groups did not differ significantly regarding their sociodemographic characteristics or the study variables.

The control group consisted of 16 employees. Their mean age was 45 (SD = 14.2) years, and 71% were men and 29% were women. Forty-one per cent graduated from secondary vocational education or lower. Their mean work tenure was 2.8 (SD = 3.73) years with 58.8% participants having worked at the organization for 16 months or less. On average, they were employed for 19.53 (SD = 8.81) hours per week. Participants in the control group had similar sociodemographic characteristics with those in the intervention group save one exception: Participants in the control group had significantly lower job tenure [control group: mean = 35.06 months, experimental group mean = 93.68 months, F(1, 67) = 7.08, p = .0001]. t-Tests showed that there were no significant differences regarding the study variables between the control and experimental groups at T1.

Measures
Questionnaires (and booklets) were provided in Dutch. Scales originally developed in English were translated following a translation back-translation procedure.

Job Crafting was measured with the general job crafting scale developed by Petrou et al. (2012). This scale measures the dimensions of seeking resources, seeking challenges, and reducing hindering demands. However, we substituted the reducing hindering demands dimensions with the optimizing demands strategy that was
introduced by Demerouti and Peeters (2018). Sample items include the following: ‘I ask my colleagues for feedback’ (seeking resources; 3 items; T1: $\alpha = .70$, T2: $\alpha = .72$); ‘I ask for more responsibilities’ (seeking challenges; 3 items; T1: $\alpha = .60$, T2: $\alpha = .80$); and ‘I try to work more efficiently’ (optimizing demands; 4 items; T1: $\alpha = .81$, T2: $\alpha = .74$). Participants could respond on a frequency scale ranging from 1 = never; 2 = seldom; 3 = sometimes; 4 = often; and 5 = always.

Exhaustion was measured using the exhaustion subscale of the Oldenburg Burnout Inventory (OLBI) (Demerouti, Bakker, Vardakou, & Kantas, 2003). The OLBI scale has been used in similar contexts (Gordon et al., 2018) and measures exhaustion with eight items on a 4-point scale (1 = totally agree; 2 = agree; 3 = disagree; and 4 = totally disagree). Sample item includes the following: ‘Some days, I feel tired before I start my job’ (reversed). Responses were coded so that high scores indicated high levels of exhaustion. The scale was reliable at both measurement points (T1: $\alpha = .85$, T2: $\alpha = .81$).

Change attitude was measured using items from the scale of attitude towards change developed by Dunham et al. (1989). Of the 18 items of the original scale measuring the affective, cognitive, and behavioural dimensions of attitude towards change, 15 items have been used, five for each dimension. We selected the items with highest factor
loadings. Example items are the following: ‘I don’t like change’ (reversed, affective, T1: a = .72, T2: a = .79), ‘Most of my colleagues benefit from change’ (cognitive, T1: a = .88, T2: a = .90), and ‘Change often helps me to perform better’ (behavioural, T1: a = .77, T2: a = .86). Items were rated on a 6-point scale ranging from 1 = totally disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; and 6 = totally agree.

Safety behaviour was assessed using five items that were developed for the purpose of this study. The items were developed in line with the conceptualization of safety performance by Neal et al. (2000) capturing compliance with and participation in organization’s standard operating procedures, namely ‘I keep my distance from a reach truck when my colleague operates one’, ‘I don’t work in a way that prevents damaged goods’, ‘At the end of my shift I take care that I leave my workplace clean’, ‘I address my colleagues in a constructive way regarding an incorrect work method’, ‘When I am restocking, I place the products according to the guidelines’. Participants had to indicate their level of agreement on a 6-point scale ranging from 1 = totally disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; and 6 = totally agree. Reliability was a = .60 at both measurement points.

Quality information was measured with three items constructed by Miller, Johnson, and Grau (1994). A sample item is as follows: ‘The information I have received about the changes has been useful’ (T1: a = .75; T2: a = .90). Participants indicated the degree to which they agree with each statement on a 6-point scale ranging from 1 = totally disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; and to 6 = totally agree.

Leadership behaviour was measured with three items developed to measure leaders’ change orientated behaviour as described by Yukl (2012). Specifically, we developed the following items based on Yukl’s construct definitions ‘The team managers...’ ‘encourage innovative thinking and new approaches for solving problems’, ‘encourage me to share new knowledge with others’, ‘talk about the importance of flexibility and innovation’ (T1: a = .82, T2: a = .87). Participants could choose among the following answers: 1 = totally disagree; 2 = somewhat disagree; 3 = somewhat agree; 4 = agree; and 5 = totally agree.

Strategy of analyses
Hypotheses 1-4 were tested by means of repeated-measures GLM. The within factor was measurement time (coded as T1 = 0 (pre-intervention) and T2 = 1 (post-intervention)), and the between factor was group membership (coded as control group = 0 and intervention group = 1). To test whether the effects remained significant after controlling for T1 measures of the control variables (quality information and leaders’ change-oriented behaviour) (cf. Hypothesis 6), we conducted the analysis with and without the control variables. Following the suggestions of van Breukelen and Van Dijk (2007), the covariates were centred around the grand mean.

Since data follow a repeated-measures design with measurement points (level 1) nested within individuals (level 2), the indirect effects of Hypothesis 5 were tested by means of multilevel regression analyses with MLwiN 2.30 (Rasbash, Steele, Browne, & Goldstein, 2009). Again, we used dummy variables for measurement time and group membership, as well as their interaction to test moderation effects. To test for indirect effects, we followed the steps proposed by Mathieu and Taylor (2006). Step 1 requires the interaction of time × group membership to relate to the mediators (i.e., job crafting behaviours). Step 2 requires the mediators to relate to
the outcome variable, while controlling for the interaction effect, and Step 3 requires the indirect effect of the interaction through the mediator on the outcome to be significant. The significance of the indirect effects was tested with the Monte Carlo method for assessing mediation (MCMAM; Selig & Preacher, 2008). To test Hypothesis 6, we controlled for quality information and leadership behaviour, when testing Hypothesis 5.

In the multilevel analyses, the dummy variables were left uncentred, the mediating variables (i.e., seeking resources, seeking challenges, and optimizing demands) were centred to the grand mean to allow for the cross-level interaction effect to carry over to the outcome variables, while quality information and leadership behaviour were centred to the person mean. The calculation of intra-class correlation coefficients suggested that substantial amounts of variance could be attributed at the between-person level of analysis in all outcome variables (seeking resources: 52.4%; seeking challenges: 42%; optimizing demands: 54.9%; exhaustion: 52.5%; affective component of change attitude: 52.5%; behavioural component of change attitude: 42%; cognitive component of change attitude: 47%; safety behaviour: 23.6%) justifying the use of multilevel analyses. In these analyses, we used quality information and leadership behaviours as level 1 variables, to control for the change of employees’ perceptions in these variables. Since we were interested in explaining within-person changes in the outcome variables as a result of the intervention, it would make less sense to control for pre-intervention levels of leadership (as a level 2 factor in line with the repeated-measures ANOVA) because this would explain between-person and not within-person variance in the outcome variables.

Results

Table 2 presents means and standard deviations for both groups at both measurement points as well as paired-sample t-tests for all study variables for the intervention group, whereas Table 3 presents the correlations between the study variables. First, we performed confirmatory factor analyses to examine the factorial validity of our measures at T1. Due to the small number of cases, we conducted the analysis separately for job crafting, change attitudes, and change behaviour/exhaustion. The proposed three-factor model for job crafting showed a satisfactory fit to the data ($\chi^2 (24) = 51.21; \text{GFI} = .88, \text{CFI} = .84; \text{SRMR} = .07$) and all items loaded significant on the expected factors. Moreover, the three-factor model was significantly better than an alternative two-factor model, where seeking resources and challenges collapsed in one factor ($\Delta\chi^2 (2) = 9.72, p < .01$), and the one-factor model ($\Delta\chi^2 (2) = 23.00, p < .01$). The three-factor model for the change attitude components ($\chi^2 (87) = 190.25; \text{GFI} = .80, \text{CFI} = .81; \text{SRMR} = .13$) fit better to the data than the two-factor model, where the behavioural and cognitive components collapsed in one factor ($\Delta\chi^2 (2) = 25.46, p < .01$) and the one-factor model ($\Delta\chi^2 (2) = 99.72, p < .01$). The model discriminating exhaustion and change behaviour showed satisfactory fit to the data ($\chi^2 (64) = 101.20; \text{GFI} = .84, \text{CFI} = .87; \text{SRMR} = .08$) and fit significantly better than the one-factor model ($\Delta\chi^2 (2) = 42.27, p < .01$). Finally, the one-factor model for the five items of change behaviour alone showed a good fit to the data, ($\chi^2 (5) = 8.43; \text{GFI} = .96, \text{CFI} = .92; \text{SRMR} = .10$).
Table 2. Means, standard deviations, and paired-sample t-tests and Morris’ effect sizes for the study variables at the pre- and post-measurement points (n intervention = 53 and n control = 16)

| Variable                      | Intervention | Control | t-test<sup>a</sup> | Morris |
|-------------------------------|--------------|---------|--------------------|--------|
|                               | M    | SD   | M    | SD   | t<sup>b</sup> | p    | d    |
| JC: Seeking Resources pre     | 3.58 | 0.61 | 3.49 | 0.56 | 0.15         | .881 | 0.13 |
| JC: Seeking Resources post    | 3.60 | 0.58 | 3.43 | 0.58 |              |      |      |
| JC: Seeking Challenges pre    | 2.73 | 0.93 | 2.97 | 1.23 | 3.91         | .001 | 0.51 |
| JC: Seeking Challenges post   | 3.25 | 0.69 | 2.97 | 1.01 |              |      |      |
| JC: Optimizing Demands pre   | 3.73 | 0.72 | 3.90 | 0.76 | 2.91         | .005 | 0.22 |
| JC: Optimizing Demands post   | 3.97 | 0.49 | 3.98 | 0.49 |              |      |      |
| Exhaustion pre               | 2.21 | 0.54 | 2.03 | 0.55 | -2.59        | .012 | -0.88|
| Exhaustion post              | 2.03 | 0.48 | 2.33 | 0.81 |              |      |      |
| Change Attitude: Affective pre| 4.38 | 0.93 | 4.43 | 1.01 | 0.29         | .775 | 0.01 |
| Change Attitude: Affective post| 4.42 | 0.71 | 4.46 | 0.79 |              |      |      |
| Change Attitude: Behavioural pre| 4.23 | 0.79 | 4.50 | 0.66 | 3.53         | .001 | 0.51 |
| Change Attitude: Behavioural post| 4.58 | 0.55 | 4.46 | 0.58 |              |      |      |
| Change Attitude: Cognitive pre| 3.91 | 0.81 | 4.13 | 0.97 | 3.34         | .002 | 0.40 |
| Change Attitude: Cognitive post| 4.25 | 0.58 | 4.13 | 0.73 |              |      |      |
| Safety behaviour pre         | 4.78 | 0.76 | 5.10 | 0.64 | 3.74         | .001 | 0.61 |
| Safety behaviour post        | 5.13 | 0.37 | 5.00 | 0.47 |              |      |      |

Note. JC = job crafting.
<sup>a</sup>Paired-sample t-tests for the experimental group, post-pre measurement.; <sup>b</sup>For all t-tests, df = 52.

**Hypothesis testing**

To test the effects of the intervention on job crafting (Hypothesis 1) and on the outcomes of interest (Hypotheses 2-4), we performed repeated-measures GLM (see Table 4). The Box test of equality for covariance matrices was not significant for all analyses. Results revealed that participants in the intervention group did not report higher levels of seeking resources \(F(1, 67) = .21, p = .65\) or optimizing demands \(F(1, 67) = 96, p = .33\), but they did report higher levels of seeking challenges \(F(1, 67) = 4.28, p = .04\) after the intervention and in comparison with participants in the control group. Further, analyses showed that compared to the control group, the intervention group reported lower levels of exhaustion \(F(1, 67) = 10.96, p = .01\), higher levels of the behavioural component of change attitude \(F(1, 67) = 10.96, p = .01\), as well as higher safety behaviour \(F(1, 67) = 5.46, p = .02\) after the intervention. The intervention group did not show any direct improvements in the affective \(F(1, 67) = .00, p = .99\) and cognitive component of change attitude \(F(1, 67) = 2.86, p = .10\).

We also conducted paired-sample t-tests for the intervention and the control groups, separately (Table 2). In all examined variables, the control group did not report any significant changes over time. As shown in Table 2, we found two additional effects of the intervention. Namely, the intervention group reported significantly higher levels of optimizing demands and more positive cognitive attitudes towards change after the intervention. Moreover, it is interesting to note that next to the significant effects, the effect size of the intervention (Morris, 2008) on job crafting ranged between .13 and .51 and on the outcomes between .01 and .88 (cf. Table 2). Taken together, these results support Hypotheses 1b, 1c (only with the univariate tests), 2, 3b, 3c (only with the univariate tests), and 4, whereas Hypotheses 1a, and 3a were rejected, as the intervention had no effect on seeking resources and the affective component of change attitude.
Table 3. Correlations between the study variables (N = 69)

| Pre-measure | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Quality information | –   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2. Leadership behaviour | .07 | –   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3. Seeking resources | .05 | .42b| –   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4. Seeking challenges | .11 | .22 | .07 | –   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 5. Optimizing demands | –43b| .01 | –07 | .02 | .08 | –    |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6. Exhaustion | .24*| .10 | .26*| .43b| .20 | –19 | –   |     |     |     |     |     |     |     |     |     |     |     |     |
| 7. Change Attitude: Affective | .20 | .28b| .36b| .31b| .48b| –12 | .38b| –   |     |     |     |     |     |     |     |     |     |     |     |
| 8. Change Attitude: Behavioural | .26*| .27*| .19 | .51b| .25*| –08 | .30*| .62b| –   |     |     |     |     |     |     |     |     |     |     |
| 9. Change Attitude: Cognitive | .03 | .34b| .13 | .07 | .40b| .02 | .04 | .46b| .33b| –   |     |     |     |     |     |     |     |     |     |
| 10. Safety behaviour | .59b| .07 | .12 | –05 | .24*| –31b| .25*| .21 | .10 | .02 | –   |     |     |     |     |     |     |     |     |
| 11. Quality information | .29*| .69b| .34b| .23 | .19 | –25*| .18 | .14 | .30*| .11 | .31b| –   |     |     |     |     |     |     |     |
| 12. Leadership behaviour | .16 | .33b| .52b| .24*| .20 | –12 | .22 | .18 | .12 | .07 | .19 | .38b| –   |     |     |     |     |     |     |
| 13. Seeking resources | .05 | .41b| .34b| .51b| .11 | .04 | .20 | .18 | .31*| .07 | .04 | .44b| .45b| –   |     |     |     |     |     |
| 14. Seeking challenges | .04 | .44b| .40b| .09 | .64b| .05 | .08 | .32b| .18 | .39b| .15 | .39b| .41b| .42b| –   |     |     |     |     |
| 15. Optimizing demands | .19 | .37b| .28*| .26*| .26*| –22 | .19 | .50b| .42b| .21 | .25*| .50b| .37b| .45b| .42b| –24 | .52b| –   |     |
| 16. Exhaustion | .30*| .16 | .32b| .43b| .09 | .19 | .54b| .30*| .41b| .10 | .28*| .40b| .31b| .52b| .21 | –17 | –   |     |     |
| 17. Change Attitude: Affective | .19 | .30*| .28*| .40b| .16 | .19 | .34b| .40b| .55b| .19 | .26*| .40b| .28*| .45b| .27*| .03 | .50b| .65b| –   |
| 18. Change Attitude: Behavioural | .06 | .43b| .13 | .08 | .23 | .01 | .18 | .20 | .24*| .35b| .17 | .47b| .10 | .19 | .35b| –15 | .22 | .29*| .24*|
| 19. Change Attitude: Cognitive | .20 | .19 | .28*| .40b| .16 | .19 | .34b| .40b| .55b| .19 | .26*| .40b| .28*| .45b| .27*| .03 | .50b| .65b| –   |

*p < .05; **p < .01.*
To test the indirect effect of the intervention (Hypothesis 5), we first inspected whether the interaction of time × group membership relates significantly to the mediators (i.e., job crafting behaviours). The interaction was not significantly related to seeking resources (estimate = .075, t = 4.7, p = .68) and to optimizing demands (estimate = .158, t = 1.00, p = .32) but was significantly related to seeking challenges (estimate = .526, t = 2.10, p = .04). Based on these results, the hypothesized indirect effect could only be tested for seeking challenges. The results for Step 2 (i.e., job crafting should relate to the outcome variables while controlling for the main effects of time, group, and their interaction effect) are presented in Table 5. Seeking challenges did not relate to exhaustion (estimate = −.011, t = −.21, p = .83) and safety behaviour (estimate = .004, t = .07, p = .94), while it related positively and significantly to the affective (estimate = .363, t = 5.11, p = .00001), the cognitive (estimate = .320, t = 5.16, p = .00001), and the behavioural (estimate = .176, t = 3.26, p = .001) components of change attitude. Regarding the significance of the indirect effect (cf. Step 3), the MCMAM supported the positive and indirect effects of the time × group interaction on the affective (LL = .013, UL = .401), the cognitive (LL = .011, UL = .357), and the behavioural (LL = .005, UL = .216) components of change attitude via seeking challenges. These results suggest that Hypothesis 5 supported only for the change attitude components.

Finally, Hypothesis 6 suggested that the effects of the intervention would remain significant even after controlling for quality information and leadership behaviour. We tested the hypothesis with two types of analysis. First, we included the baseline (T1) control variables as covariates in the repeated-measures GLM (see Table 4). Results indicated that the significant intervention effects on seeking challenges, exhaustion, the behavioural component of change attitude, and safety behaviour remained significant even after controlling for T1 quality information and leader behaviour. Second, as can be seen in Table 5 (Model 2), the significant effects of seeking challenges on the change

| Variables                        | SS  | F   | p   | partial η² |
|----------------------------------|-----|-----|-----|------------|
| Seeking Resources                | .03 | .21 | .65 | .003       |
| Seeking Resources               | .06 | .35 | .55 | .005       |
| Seeking Challenges              | 1.70| 4.28| .04 | .060       |
| Seeking Challenges               | 1.57| 3.89| .05 | .056       |
| Optimizing Demands              | .15 | .96 | .33 | .014       |
| Optimizing Demands               | .15 | .91 | .34 | .014       |
| Exhaustion                      | 1.42| 10.96| .01 | .141       |
| Exhaustion                       | 1.19| 9.03| .01 | .122       |
| Change Attitude: Affective       | .00 | .00 | .99 | .000       |
| Change Attitude: Affective       | .00 | .00 | .96 | .000       |
| Change Attitude: Behavioural     | .91 | 4.02| .05 | .057       |
| Change Attitude: Behavioural     | 1.05| 4.60| .04 | .066       |
| Change Attitude: Cognitive       | .73 | 2.86| .10 | .041       |
| Change Attitude: Cognitive       | .98 | 3.86| .054| .056       |
| Safety behaviour                 | 1.28| 5.46| .02 | .075       |
| Safety behaviour                 | 1.54| 6.61| .01 | .092       |

Note. aResults of repeated-measures GLM including the pre-measures of the control variables (quality information and leadership behaviour) in a grand-mean-centred form.; bFor all analyses, df = 1.
Table 5. Multilevel analyses examining the indirect effects of the intervention (N = 69)

| Variables | Exhaustion | Affective attitude | Cognitive attitude | Behavioural attitude | Safety behaviour |
|-----------|------------|--------------------|--------------------|--------------------|-----------------|
|           | Estimate   | SE                 | t                  | Estimate           | SE              | t                  | Estimate           | SE              | t                  | Estimate           | SE              | t                  |
| **Model 1** |           |                    |                    |                    |                 |                    |                    |                 |                    |                    |                 |                    |
| Intercept | 2.035      | .052               | 39.28***           | 4.439              | .180            | 24.66***           | 4.133              | .157            | 26.32***           | 4.507              | .137            | 32.90***           |
| Time      | .305       | .125               | 2.44*              | .037               | .188            | .20               | -.005              | .169            | -.03              | -.051              | .144            | -.35              |
| Group     | .166       | .158               | 1.05               | .052               | .207            | .25               | -.123              | .180            | -.68              | -.187              | .157            | -.1.19             |
| Time × Group | -.465   | .145               | -3.21**            | -.232              | .217            | -1.07             | .142               | .196            | .72               | .216               | .167            | 1.29               |
| Seek. Resources | .005   | .082               | .06               | .190               | .114            | 1.67              | .121               | .100            | 1.21              | .245               | .087            | 2.82**             |
| Seek. Challenges | -.011  | .052               | -.21              | .363               | .071            | 5.11***           | .320               | .062            | 5.16***           | .176               | .054            | 3.26**             |
| Opt. Demands | -.071  | .080               | -.89              | .157               | .110            | 1.43              | .165               | .096            | 1.72              | .365               | .084            | 4.35***            |
| Time × Group | -.505   | .145               | -.321**           | -.232              | .217            | -1.07             | .142               | .196            | .72               | .216               | .167            | 1.29               |
| Seek. Resources | .005   | .082               | .06               | .190               | .114            | 1.67              | .121               | .100            | 1.21              | .245               | .087            | 2.82**             |
| Seek. Challenges | -.011  | .052               | -.21              | .363               | .071            | 5.11***           | .320               | .062            | 5.16***           | .176               | .054            | 3.26**             |
| Opt. Demands | -.071  | .080               | -.89              | .157               | .110            | 1.43              | .165               | .096            | 1.72              | .365               | .084            | 4.35***            |
| **Model 2** |           |                    |                    |                    |                 |                    |                    |                 |                    |                    |                 |                    |
| Intercept | 2.036      | .137               | 14.86***           | 4.439              | .180            | 24.66***           | 4.129              | .156            | 26.47***           | 4.504              | .134            | 33.61***           |
| Time      | .301       | .122               | 2.47*              | .032               | .185            | .77               | .000               | .164            | .00               | -.052              | .135            | -.39               |
| Group     | .175       | .157               | 1.11               | .052               | .207            | .25               | -.144              | .179            | -.88              | -.210              | .155            | 1.35               |
| Time × Group | -.484   | .143               | -3.38***           | -.226              | .216            | -.05              | .188               | .191            | .98               | .274               | .158            | 1.73               |
| Seek. Resources | -.000  | .082               | -.00              | .168               | .114            | 1.47              | .120               | .099            | 1.21              | .214               | .085            | 2.52**             |
| Seek. Challenges | .003  | .052               | .06               | .372               | .071            | 5.24***           | .299               | .062            | 4.82***           | .172               | .053            | 3.25**             |
| Opt. Demands | -.079  | .080               | -.99              | .159               | .109            | 1.46              | .176               | .095            | 1.85              | .377               | .081            | 4.65***            |
| Quality Inform. | -.107  | .061               | -.175             | -.090              | .093            | -.97              | .158               | .082            | 1.93              | .029               | .068            | .43               |
| Leadership Beh. | .028   | .104               | .27               | .168               | .157            | 1.07              | .078               | .139            | .56               | .348               | .115            | 3.03**             |
| Δ-2 x log Δdf = 3 |     |                    |                    |                    |                 |                    |                    |                 |                    |                    |                 |                    |
| Level 1 Variance | .124  | .021               | 17%               | .281               | .048            | .14%              | .228               | .039            | 22%              | .166               | .028            | 38%               |
| Level 2 Variance | .176  | .042               | 0%                | .236               | .068            | 35%               | .164               | .051            | 37%              | .133               | .039            | 31%               |
| ⌬-2 x log Δdf = 2 |     |                    |                    |                    |                 |                    |                    |                 |                    |                    |                 |                    |
| Level 1 Variance | .193  | .021               | 17%               | .281               | .048            | .14%              | .228               | .039            | 22%              | .166               | .028            | 38%               |
| Level 2 Variance | .176  | .042               | 0%                | .236               | .068            | 35%               | .164               | .051            | 37%              | .133               | .039            | 31%               |
| Δ-2 x log Δdf = 2 |     |                    |                    |                    |                 |                    |                    |                 |                    |                    |                 |                    |
| Level 1 Variance | .124  | .021               | 17%               | .281               | .048            | .14%              | .228               | .039            | 22%              | .166               | .028            | 38%               |
| Level 2 Variance | .176  | .042               | 0%                | .236               | .068            | 35%               | .164               | .051            | 37%              | .133               | .039            | 31%               |

Note. Time: 0 = pre and 1 = post; Refer. Category = pre; Group: 0 = control and 1 = experimental; Refer. Category = control; R² percentages are calculated in approximation.

***p < .001; **p < .01; *p < .05.
attitude components were similar and remained significant when quality information and leadership behaviour were added as controls in the analysis. Moreover, the MCMAM results suggested that the indirect effects remained significant even after the inclusion of quality information and leadership behaviour for the affective ($LL = .027, UL = .430$), the cognitive ($LL = .020, UL = .353$), and the behavioural ($LL = .009, UL = .219$) components of change attitude via seeking challenges. Taken together, results of both types of analyses provided support for Hypothesis 6. As can be seen in Table 5, whereas quality information was unrelated to the outcomes, leadership behaviour related positively to safety behaviour and the behavioural component of change attitude (over and above the effect of the training and job crafting).

**Discussion**

The main goal of this study in a blue-collar context was to promote employees’ positive attitudes towards organizational change and change-related safety behaviour (i.e., compliance and support of safety procedures), while preventing energy depletion (i.e., high levels of exhaustion). Job crafting was suggested to achieve the above-mentioned goals and a job crafting intervention, based on JD-R theory (Bakker & Demerouti, 2017), experiential learning theory (Kolb et al., 2000), and goal-setting theory (Latham & Locke, 2007) focusing on seeking resources, seeking challenges, and optimizing demands was applied to increase job crafting behaviour. The study findings supported the effectiveness of the intervention to increase job crafting behaviour (seeking challenges and – to a lesser extent – optimizing demands), safety behaviour, and the behavioural component of change attitude and to reduce employees’ exhaustion. Seeking challenges explained why the intervention was effective to improve the affective, cognitive, and behavioural components of change attitude. These effects remained even after controlling for two important factors for change implementation: leader change-oriented behaviour and quality information.

**Theoretical implications**

This study contributes to the job crafting literature in several ways. A central aim was to advance our theoretical understanding of the job crafting intervention’s effectiveness. We achieved this aim in the following ways. First, we proved evidence regarding the external validity of the job crafting intervention by supporting its effectiveness for blue-collar work. Whereas previous studies have focused on the public sector (Demerouti et al., 2017; Van den Heuvel et al., 2015; Van Wingerden, Bakker & Derks, 2017) and health care (Gordon et al., 2018), the current study supported the effectiveness of the intervention in a retail environment responding to calls for studies outside white-collar work (Van Wingerden et al., 2017). In line with previous studies (Gordon et al., 2018; Van Wingerden et al., 2017), the intervention led to increased seeking challenges. Seeking challenges is particularly important for the blue-collar context, which does not necessarily make use of employees’ skills. By taking on new responsibilities and assignments, employees keep their motivation at a higher level. Also, our job crafting intervention was effective in stimulating a variety of favourable outcomes within a blue-collar context as it decreased exhaustion, and increased change attitude, and safety behaviour. These findings are in line with earlier research confirming the effectiveness of the job crafting intervention for
multiple outcomes including well-being, attitudinal, and behavioural indicators (Gordon et al., 2018; Van Wingerden et al., 2017).

However, it still remains unclear how the intervention produced all positive changes in outcomes. We found that the intervention increased change attitudes due to increases in seeking challenges, but we could not explain the positive effect of the intervention on exhaustion and safety behaviour. This may be due to the rather small size of the control group or it may imply that we cannot prove empirically that the intervention worked because it caused more job crafting behaviour. Although previous studies confirmed the suggested mediating effect (Dubbelt et al., 2019; Gordon et al., 2018), the study of Demerouti et al. (2017) uncovered an alternative pathway in the context austerity-led organizational changes, namely through positive affect. Future research is necessary to clarify this issue.

Second, our intervention was the first to show that employees can be trained to optimize their job demands, highlighting the ability of individuals to find ways to work more efficiently thereby, saving resources that can be used for their goal accomplishment (Demerouti & Peeters, 2018). The latter is based only on univariate results. However, optimizing job demands is particularly important because it is newly introduced to the job crafting literature and it seems to be more constructive than reducing demands (Demerouti & Peeters, 2018; Demerouti et al., 2018). The intervention was found to be successful in helping employees to free up resources (by optimizing demands) such that they could seek challenges (engage in safety behaviour). In this way, we add to the ongoing discussion regarding the favourable and unfavourable job crafting strategies (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017) by highlighting the relevance of optimizing demands as a core job crafting strategy.

Similar to Demerouti et al.’s (2017) intervention study within an organizational change context, this study did not support that the intervention can yield resource seeking behaviour. This is surprising as two of the four weekly assignments involved seeking resources. Meta-analytic evidence of job crafting interventions (Oprea et al., 2019) also confirms that job crafting interventions significantly increased only seeking challenges and reducing demands behaviour. Our explanation for this finding is that employees may have found it difficult to ask for advice or feedback from colleagues, partly due to the perceived time pressure to complete their tasks as concluded from the evaluative sessions. In light of these findings, the role of optimizing demands seems to become even more relevant.

Our study also adds to the literature on safety behaviour at work that is relevant for many jobs nowadays. The findings that support the role of employee job crafting behaviours for safety implementation are in line with the model of workplace safety (Christian et al., 2009) that highlights the importance of situational and person-related factors for safety behaviour, as well as with literature on the importance of proactivity to increase safety behaviour (Curcuruto et al., 2019). According to our results, individuals should be motivated to proactively arrange the conditions (job demands and resources) necessary to help them in integrating these tools in their daily work. Simply introducing safety protocols or sanction employees for non-compliance will not lead to successful adoption of safety behaviour. In other words, the introduction of safety procedures, which generally occurs top-down, needs to be complemented with bottom-up approaches to be effective. Similarly, our findings extend previous studies like that of Hammer et al., (2016), who supported the effectiveness of a work–family intervention aimed at increasing contextual resources via supervisor support for work and family matters for safety compliance. Hence, to promote safety, organizations may complement
interventions to allocate resources in the work environment with interventions that promote employees’ proactivity to behave in a safe manner via job crafting.

Finally, our study contributes to the literature on adaptive performance during change. We showed that introducing new safety procedures can be more effectively implemented when organizations pay attention to how employees translate these procedures into daily work practices. Earlier studies (Demerouti et al., 2017; Gordon et al., 2018; Peeters et al. 2016) found that adaptive behaviour is promoted by seeking challenges and seeking resources, which was not confirmed in our study, as we found that only optimizing demands related positively to safety behaviour. According to the participants, the main reason that adherence to the SOP was not attained before the intervention was because of perceived workload increase. By optimizing demands, employees may have found a way to still achieve adherence to the SOP, while optimizing their levels of job demands.

Moreover, this study integrated the job crafting and the change literatures by supporting the role of a job crafting intervention in forming change attitude (i.e., a key outcome in the change literature; Oreg et al., 2011). Results revealed that the job crafting intervention improved employees’ affective, cognitive, and behavioural attitudes towards change via the increase of seeking challenges. These findings are theoretically novel and relevant since, to the authors’ knowledge, this is the first job crafting intervention study including employee change attitude as an outcome of job crafting behaviour. Although job crafting behaviour has previously been linked to organizational change (Petrou et al., 2018), attention has been focused on increasing adaptive behaviour through job crafting behaviour. Job crafting and especially seeking challenges ‘activate’ the affective, cognitive, and behavioural component of an attitude to change. This means that when employees practice proactive and positive work behaviour such as job crafting, they are more likely to feel positively about the change, to cognitively endorse the change and to adopt a positive intention to become behaviourally engaged in the change. Given that attitudes are precursors of intentions to show a specific (change) behaviour (Fishbein & Ajzen, 2012), our study suggests that job crafting represents an important antecedent of this process, providing an avenue for further research on attitudes and change.

It is worth noting that the effect of the intervention remained even after controlling for two important contextual factors that are found to determine the success of organizational changes. Whereas quality information during change was unrelated to the outcomes of interest, leadership behaviour related positively to the behavioural component of change attitude and to safety behaviour. These results highlight the importance of job crafting for the implementation of organizational changes over and above organizational- and group-level resources that are considered relevant during change implementation (Vakola & Petrou, 2018).

Limitations and future research

The limitations of this study must be noted. First, although participants in the control group were working in a similar department to that of employees in the intervention group but in another location to avoid cross-contamination, the sample size of the control group was small. This may impede the reliability of the results. Quasi-experimental field studies are prone to issues regarding internal validity due to differences in demographics between the experimental and the control groups as there is no strict random sampling. However, in this study these differences were negligible as suggested by the results of independent-sample t-tests, which somewhat counteracts these concerns. Second, the participants of the control group were not randomly selected and did not receive any
treatment at all. This could inflate effect sizes and cannot eliminate the possibility of confounding bias, which hinders our ability to draw causal inferences.

Third, participation was not voluntary, as all employees in the intervention group were urged to participate in the workshop preceding the PCP. Although participation in the workshops was not voluntary, the completion of the PCP and of the questionnaire was. This reduces participation biases, which is a strength of our study, but it may limit the effectiveness of the training due to unwilling, reluctant, or hesitant employees. Van den Heuvel et al. (2015) argued that the training is more effective if employees voluntarily participate. Moreover, job crafting is self-initiated behaviour and should not be forced (Petrou et al., 2015).

Fourth, there are several limitations regarding measurements. First, all measures were self-reports and therefore may be biased. Second, the scale for safety behaviour was created for the specific study context, and Cronbach’s alphas were lower than desired. An explanation for this may be that the questions regarding the SOP were quite diverse and measure several aspects of the operating procedures. Third, we used a different answering format for leadership behaviour than that of the original scale (i.e., $1 = \text{totally disagree}$ to $5 = \text{totally agree}$ instead of $1 = \text{not at all or not applicable}$ to $5 = \text{to a great extent}$), which may have limited its predictive power.

The current study is unique due to the special research context. The retail environment with a mix of employees from different educational and demographical backgrounds may well influence the results, as suggested by Demerouti (2014). Therefore, more intervention studies with heterogeneous samples in terms of their background characteristics are necessary in order to test the external validity of the job crafting intervention (Oprea et al., 2019). Further research should enhance our understanding about whether and under which conditions the optimizing demands behaviour frees resources necessary to adjust to organizational change. Moreover, assessing the impact of a combined top-down and bottom-up, job crafting intervention with a top-down only, and a job crafting only intervention would yield interesting results about how effective the two types of interventions are, and whether the one may substitute for the other. A final avenue for future research is to uncover whether the interplay between employee change attitude and job crafting behaviour may stimulate adaptive behaviour during organizational change.

**Practical implications and conclusion**

This study is practically relevant to managers/leaders or HR officers who aim at successfully implementing organizational changes. According to our results, employees adopted a more positive attitude towards becoming engaged in the change process when introduced to the job crafting intervention. Given the high rates of failure in change implementation (Werkman, 2009), job crafting can be introduced to employees through interventions or training as a way of improving positive valence and high activation reactions towards change and, therefore, increase its chances of success. Importantly, our study suggests that job crafting interventions during organizational change add value over and above organisational- and leaders’ change-related actions.

In addition, managers and leaders from all sectors, some more than others, are concerned with and invest in safety behaviour. Many human lives are lost every year, and there are many injuries or microaccidents because safety protocols and procedures exist but are not adopted by employees and managers (Havold, 2010; Mearns, Flin, Gordon, & Fleming, 2001). By following a directive way to introduce safety procedures (i.e.,
informing employees about their advantages and what is expected, focusing on examples of non-adherence and sanctioning dangerous behaviours by official warnings), people will not be motivated to adopt safety behaviour. Through the job crafting intervention, participants are encouraged to set goals and stay committed to these goals, deal with obstacles, and identify facilitators related to safety behaviour at work. As a result, introducing job crafting to employees will help them gain control over issues of concern related to their job (like safety in this case) and translate top-down directions and procedures into daily work practices supported by a positive intention to adopt them. Lastly, the job crafting intervention can aid in developing a resilient workforce. After the job crafting intervention, employees can be skilled to find new resources and challenges and optimize increased job demands due to change by seeking smarter ways to work. This can further assist them in finding a balance between demands and resources on the job and in developing a more positive attitude towards change and in avoiding exhaustion.

**Conflict of interest**

All authors declare no conflict of interest.

**Author contributions**

Evangelia Demerouti (Conceptualization; Data curation; Formal analysis; Methodology; Supervision; Writing – original draft; Writing – review & editing) Luc Soyer (Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Writing – original draft; Writing – review & editing) Maria Vakola (Writing – original draft; Writing – review & editing) Despoina Xanthopoulou (Formal analysis; Writing – original draft; Writing – review & editing).

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Job crafting intervention
399

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