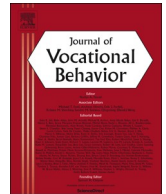




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Job crafting and playful work design: Links with performance during busy and quiet days

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ABSTRACT

This study uses proactive work behavior and job demands–resources (JD-R) theories to propose that employees can use two proactive behavioral strategies to improve the internal organizational environment, namely job crafting and playful work design (PWD). Whereas job crafting concerns the proactive adjustment of the job, PWD refers to the active creation of conditions at work that foster play. We hypothesize that individuals perform better on the days they seek job resources and challenges, or design their work to be playful. In addition, we propose that seeking job resources and reducing job demands are most effective when work pressure is high, and that seeking challenges and PWD are most effective when work pressure is low. A total of 77 Norwegian naval cadets completed a diary questionnaire for 30 consecutive days (total $N = 2310$). Results of multilevel modeling showed that daily seeking job resources, seeking challenges, and playful work design were each positively related to colleague-ratings of job performance. Reducing job demands was negatively related to performance. Furthermore, as hypothesized, seeking challenges and PWD were most effective when the work pressure was low. These findings contribute to the proactive work motivation and JD-R literatures by showing which work strategies are positively related to job performance, and under which conditions.

1. Introduction

Work psychology has traditionally focused on job design, outlining how employees adjust to various job characteristics in order to perform their work (e.g., Hackman & Oldham, 1976; Morgeson & Campion, 2003). More recently, research has started to investigate how employees proactively change the characteristics of their job and situation (Bindl & Parker, 2011; Frese et al., 2007). Proactive work behavior involves self-initiated, anticipatory action, and may include taking charge, voicing concerns, and seeking feedback (Parker & Bindl, 2017). There is considerable evidence that engaging in such behaviors is related to favorable performance outcomes. Proactive behavior at work improves the fit between the individual and the job, increases opportunities to use one's strengths, and may improve the meaning of work (Bindl & Parker, 2011; Kooij et al., 2017).

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In the present study, we use a quantitative diary approach and follow naval cadets during 30 successive working days on a sail ship to investigate how they proactively adjust the characteristics of their job and tasks through daily job crafting and playful work design. Whereas job crafting refers to the process of employees redefining and reimagining their job designs in personally meaningful ways (Wrzesniewski & Dutton, 2001), playful work design refers to the process of employees proactively creating conditions at work that foster play without changing the job itself (Bakker et al., 2020; Scharp et al., 2019). We use proactive work behavior (Parker & Bindl, 2017) and Job Demands–Resources (JD-R; Bakker & Demerouti, 2017; Tims & Bakker, 2010) literatures as a theoretical basis for our central proposition that employees perform better on the days they show proactive behavior – i.e. when they craft their jobs and design their work to be playful.

We aim to make four contributions. First, we integrate proactive work behavior and JD-R theories to argue that on the days employees use job crafting, they optimize their work environment, which is positively related to job performance. Most previous job crafting studies have followed a between-person approach, investigating how differences between employees in the frequency of job crafting result in differences regarding well-being and performance (e.g., Bakker et al., 2012; Gordon et al., 2018). We follow a within-person approach, investigating how daily fluctuations *within* employees in the frequency of job crafting covary with fluctuations in (other-ratings of) daily job performance. In this way, we answer the question whether employees perform better on the days they make small adjustments to their job content and context. Such a finding would be novel, interesting, and relevant. Within-person analyses can reveal whether daily variations from baseline proactive work behaviors have immediate implications for performance – independent from individual differences in proactivity between persons. The few job crafting studies that used a daily diary design (Demerouti et al., 2015; Demerouti & Peeters, 2018; Petrou et al., 2012; Tims et al., 2014) focused on employee well-being and/or self-ratings of daily job performance as possible outcomes. Although self-reported information is valuable for job performance, as such behaviors are not always observable by others (Spector & Fox, 2010), self-report and mono-method bias may threaten the validity of research and thus hinder the development of theories of organizational behavior (Donaldson & Grant-Vallone, 2002). By using other-ratings of performance, we ensure that the proactive work behavior – performance link cannot be explained by (daily) common method variance or self-presentation motives.

Second, we examine the unique relationship of job performance with each of the three job crafting strategies proposed by JD-R theory – increasing challenge job demands, increasing job resources, and reducing job demands. Previous research has produced mixed findings regarding the latter job crafting behavior (for a review, see Demerouti, 2014), and scholars have started to exclude contraction-oriented job crafting behaviors from their study designs (Bakker et al., 2012; Harju et al., 2016). Although recent research has suggested that reducing job demands may create conflict and undermine colleague well-being (Tims et al., 2015), it is important for job crafting theory development to find out whether and under what conditions reducing job demands may be an important strategy to protect performance. In this study, we will compare how increasing challenging job demands, reducing job demands, and increasing job resources are related to other-ratings of job performance, on a daily basis.

A third contribution of this research is that we introduce playful work design as a new proactive behavioral strategy to optimize job performance. We use the literature on playfulness (Barnett, 2007; Fluegge-Woolf, 2014) to propose that by creating a playful work experience (fun, competition), employees can make the same work more interesting and challenging, so that they stay focused and perform well. Thus, in addition to proactively changing the design of their work, we propose that employees may make their work tasks more playful and thus change the process and experience of their work. Fourth and finally, we explore the boundaries of job crafting and playful work design, and examine *when* these proactive work strategies are most beneficial. We contend that daily work pressure is an important contextual variable that determines when daily proactivity is most effective.

1.1. Theoretical background

When people are proactive, they challenge the status quo rather than passively adapting to existing conditions (Crant, 2000). Proactive individuals take the initiative to improve their current circumstances – they envision and plan a different future by changing the self and/or the environment (Parker et al., 2010). Parker and Collins (2010) identified three categories of individual-level proactive behavior at work, namely (a) proactive P-E fit behavior, with the goal to achieve a better fit between one's own characteristics and those of the internal work environment; (b) proactive work behavior, with the goal to improve the internal organizational environment; and (c) proactive strategic behavior, which involves taking control and bringing about change to improve the organization's strategy and its fit with the external environment.

In the present study, we look at job crafting through the lens of a quantitative diary. Using this micro approach of organizational behavior, we focus on proactive work behavior, which aims to improve the internal organizational environment. According to JD-R theory (Bakker & Demerouti, 2017), every job may have unique characteristics, but it is still possible to model all job characteristics in one of two general categories – namely job demands or job resources. Job demands are defined as those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs (Demerouti et al., 2001). Examples are a high daily work pressure, or – in the case of naval cadets who are studied in the present research, confrontation with heavy storms and simulated pirate attacks. Job resources refer to those aspects of the job that are functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, or stimulate personal growth and learning (Bakker & Demerouti, 2017). Examples of job resources are performance feedback, social support, and opportunities for growth.

JD-R theory proposes that employees will perform particularly well on the days that challenging job demands such as work pressure are combined with high job or personal resources (Tadic et al., 2015). Moreover, on days employees have access to sufficient resources, they will be able to deal with hindrance job demands (i.e. work tasks and conditions that require effort and energy, but do

not have growth potential; Breevaart & Bakker, 2018; LePine et al., 2005), and in this way stay engaged and perform well. A central proposition in JD-R theory is that organizations may provide optimal job demands and resources to their employees, but employees may also proactively take the initiative to improve their job demands and resources (Bakker & Demerouti, 2017).

Consistent with Parker and Bindl's (2017) proactive work behavior model, JD-R theory proposes that employees may show proactive work behavior, on a daily basis. Tims and Bakker (2010; Tims et al., 2012) argue that individuals may proactively search for challenging job demands, or rather proactively reduce their job demands. In addition, individuals may actively seek job resources. Such proactive job crafting behaviors facilitate visible manifestations of job performance, because the optimized work environment satisfies basic needs, increases the meaning of work, and stimulates work engagement (e.g., Tims et al., 2016; Wrzesniewski et al., 2013). Moreover, JD-R theory proposes that when job crafting results in an increase in job resources, employees' personal resources will increase as well – and these personal resources can be used to improve performance.

Meta-analyses have generally supported the effectiveness of job crafting in the form of increasing job challenges and increasing job resources (Lazazzara et al., 2020; Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). However, the meta-analytic findings suggest that reducing job demands is not an effective strategy. Although Tims and Bakker (2010) originally theorized that proactively reducing high-effort tasks and hindering job demands would improve well-being and performance, empirical research generally indicates that reducing job demands is *negatively* related to work engagement and performance (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). One possible reason for this is that reducing one's own workload may lead to increased workload and job strain for co-workers – which triggers arguments, builds frustrations, and increases interpersonal conflicts (Lazazzara et al., 2020; Tims et al., 2015). Reducing job demands is also effortful in itself and may therefore deplete energy (Bakker & Oerlemans, 2019). Moreover, Tims et al. (2015) have argued that decreasing hindering job demands may share similarities with avoidance-oriented coping – which is maladaptive, because the stressor is not controlled. On the basis of this theoretical overview and previous findings, we formulated the first hypothesis:

Hypothesis 1. Daily job crafting in the form of (a) increasing job resources and (b) increasing challenging job demands is positively related to other-ratings of daily job performance, whereas daily job crafting in the form of (c) reducing hindrance job demands is negatively related to other-ratings of daily job performance.

1.2. Playful work design

Next to job crafting, we propose that individuals may generate and strive for improved performance goals by changing the *experience* of work through playful work design (Scharp et al., 2019). Playful work design refers to the process through which employees proactively create conditions at work that foster play and enjoyment without changing the design of the job itself (Bakker et al., 2020; Scharp et al., 2019). Both job crafting and playful work design are proactive work behaviors that challenge the status quo (Crant, 2000; Parker et al., 2010). Employees who use these behavioral strategies improve their circumstances by actually *changing* their job demands and job resources (i.e., job crafting), or by approaching their current work tasks in novel ways so that their *personal experience* during task execution is optimized (i.e., playful work design). We decided to investigate both concepts in one study, because we propose that job crafting and playful work design are two independent forms of proactive work behavior that can facilitate job performance. The two strategies may co-occur, but it is also conceivable that playful work design is used on the days job crafting is not a viable option (and vice versa). For example, when colleagues are not around, it is difficult to ask them for immediate support. Similarly, when work tasks are stressful or boring but cannot be changed (i.e. job crafting is not possible), it may still be conceivable to optimize the approach of the tasks so that stress and boredom is reduced. Through playful work design, employees may improve their well-being and performance, because they make the work activity more fun (e.g., by framing a work situation in such a way as to provide oneself and others with amusement; Barnett, 2007), or because they create form of competition with oneself (e.g., by trying to set a time record in work). On board of a ship, playful work design may take the form of learning to tie special knots in a rope, climbing the rig as fast as possible, or organizing social gatherings as cabaret. Such playful activities may increase intrinsic motivation and creativity (Amabile et al., 1994; Scharp et al., 2019), build social resources (Sandelands, 2010), and stimulate cooperative problem solving and energetic performance (Barnett, 2007).

Similar to job crafting, playful work design may make work activities more challenging. However, there are important differences. Job crafting refers to proactively seeking new job resources (e.g., asking for feedback and support), and actively searching for *new* tasks and projects that are different from the work the employee is already involved in (Tims et al., 2012). Playful work design refers to the proactive, behavioral work orientation that designs fun and competition by imposing the experiential qualities of play on *existing work* (Scharp et al., 2019). Cognitive crafting (Wrzesniewski & Dutton, 2001) is more closely related to playful work design than other forms of job crafting due to its focus on reframing. However, whereas cognitive crafting refers to expanding the perception of task boundaries or focusing perceptions on tasks that are most meaningful (Berg, Dutton, & Wrzesniewski, 2013), playful work design refers to proactively changing the *experience* of work activities by designing these activities to be more fun or more competitive (Scharp et al., 2019).

Playfulness may take the form of interpersonal or task activities at work of a playful or humorous nature that provide employees with enjoyment or pleasure (Fluegge-Woolf, 2014). Conceptually, by setting personal challenges or by competing with oneself given the work tasks that need to be completed, individuals set goals and prevent boredom, because the work activity becomes more interesting and meaningful. In addition, by integrating amusement, humor, and entertainment in their existing tasks, workers develop interpersonal relationships, and are more likely to enjoy their work (Robert, 2017). Thus, playful work design changes the *experience* of work without changing the content of work. By redesigning the work activity so that it is more interesting and more fun,

individuals improve the internal organizational environment (Parker & Collins, 2010). Therefore, on days individuals use playful work design strategies, they are more likely to invest effort, get connected, and stand out in their work. Hence,

Hypothesis 2. Daily playful work design is positively related to other-ratings of daily job performance.

1.3. The moderating role of work pressure

Work pressure refers to the situation in which job demands (amount of work, quality standards, time limits) have risen above normal levels (Van Veldhoven, 2014). When the daily work pressure is high, quantitative job demands may exceed employees' abilities and result in time pressure. Although exposure to work pressure requires considerable effort and energy, dealing adequately with work pressure results in various gains (Van den Broeck et al., 2010). LePine et al. (2005) showed in their meta-analysis using 101 samples that challenge demands, including work pressure, had a positive direct relationship with job performance, as well as indirect relationships with performance through strain (negative) and motivation (positive).

In the present study, we investigate how daily work pressure moderates the main effects of job crafting and playful work design on job performance. An important theoretical starting point is that employees are motivated to preserve their daily energy levels in order to prevent complete loss of energetic resources (Hockey, 1993). According to the JD-R approach of job crafting (Bakker & Demerouti, 2017; Tims & Bakker, 2010), employees may protect their well-being by job crafting in the form of seeking job resources. On the days work pressure is really high, employees have a very good reason to ask for social support from colleagues and coaching by the supervisor. Dealing adequately with daily work pressure results in various gains, including increased performance (LePine et al., 2005; Van den Broeck et al., 2010). On the days work pressure is high, individuals will perform at a high level if they proactively search for the job resources needed to deal with the demands. Stated formally,

Hypothesis 3a. Daily work pressure moderates the positive relationship between daily job crafting in the form of increasing job resources and other-ratings of daily job performance. This relationship is stronger when work pressure is high (vs. low).

In contrast to increasing job resources, increasing challenge job demands is particularly likely to be successful and related to job performance when the work pressure is low (vs. high). On the days the work pressure is already high, employees need to use all their energetic resources to deal with the work pressure (Bakker & Demerouti, 2017), and it does not make sense to look for more challenges (Petrou et al., 2012). Moreover, taking on more work on such days may make the work pressure overwhelming, resulting in exhaustion, an increased risk of making mistakes, and impaired job performance (Bakker, 2015). In contrast, on the days the work pressure is relatively low, employees may take charge and look for more challenges. In this way, they can increase the meaning of work, and become more involved and productive.

Hypothesis 3b. Daily work pressure moderates the positive relationship between daily job crafting in the form of increasing challenging job demands and other-ratings of daily job performance. This relationship is stronger when work pressure is low (vs. high).

The third job crafting strategy, reducing job demands, seems particularly important on the days the work pressure is high. On the days the work pressure is low, employees have all the time needed to deal adequately with complex work problems or time-consuming requests from clients. However, on the days the work pressure is high, employees need to be selective in the tasks they take on (Hockey, 1993). On busy working days, they will, for example, be motivated to avoid taxing tasks and paperwork. Moreover, on such days, employees may want to reduce their physical, emotional, and cognitive demands because of the high effort demanded by the work. By optimizing, compensating, and selecting their daily work tasks, employees are better able to keep their job performance up to par (Demerouti, 2014; Zacher et al., 2015).

Hypothesis 3c. Daily work pressure moderates the negative relationship between daily job crafting in the form of reducing job demands and other-ratings of daily job performance. This relationship is weaker when work pressure is high (vs. low).

Finally, we propose that playful work design is most likely to foster job performance on the days work pressure is low. When employees have little work to do, they may get bored, which undermines work engagement and productivity (Harju et al., 2016). Also, on the days individuals need to execute monotonous or repetitive tasks (e.g., filling out forms, vigilance tasks; for naval cadets: cleaning the ship, being on guard duty), they may have difficulty concentrating, and show performance decrements with increasing time on task (Hopstaken et al., 2015). By proactively changing the experience of work, for example, by setting personal challenges or by competing with oneself, individuals set goals and may make the work activity more interesting and meaningful (Sonnentag, 2017). Similarly, by integrating humor in their daily work, individuals may connect to others, create a better internal organizational environment, and are more likely to enjoy their work (Robert, 2017). In contrast, on the days the work pressure is already high, employees do not need playful work design to make their work more interesting or challenging. Instead, they will need to be selective and use all their energetic resources to deal adequately with the work pressure (Hockey, 1993).

Hypothesis 4. Daily work pressure moderates the positive relationship between daily playful work design and other-ratings of daily job performance. This relationship is stronger when work pressure is low (vs. high).

2. Method

2.1. Participants and procedure

A total of 77 Norwegian naval cadets from a Military University College participated in our study. As part of their leadership training, the cadets travelled across the North Sea and the Atlantic Ocean from northern Europe to North America by sail ship. Crossing the ocean by ship is an ideal context for training, because it includes real operational work in an unpredictable environment (i.e., high ecological validity). The cadets are responsible for various different tasks to be performed in order to safely navigate the ship. Tasks may be relatively simple, like watching the sea for hazards, steering the wheel, pulling ropes, and maintenance work on deck of the ship. Tasks may also be more complex, like when taking the position of captain – organizing sail maneuvers and directing one's own and fellow cadets' work activities. Due to the rigors and challenges incurred by sailing the ship across the ocean, cadets learn a wide range of skills and competencies. Recognizing the importance of research transparency, we declare that the sample used in the present study was also used in Nordmo et al. (2019).

Participants received a booklet with diary questionnaires for the first 30 days of their 75-day stay on the ship. In order to ensure a good response rate, the cadets were instructed to fill out the questionnaire just before dinner at 5 p.m. each day. During this time, all cadets are awake and no one is allowed to sleep. In addition, each squad leader was instructed to remind his/her own squad of the daily study, and to control whether the team members filled out the daily questionnaire. The researcher on board of the ship collected the diary booklets on each of the days. As a result, the response rate across the 30 days of the voyage was 100%. Since this response rate is exceptionally high, we checked whether the responses were invalid (e.g., abnormal distributions, same answers throughout the diary, etc.). We found no indications for invalidity. Since the participants were informed that the data would be used for personal feedback sessions during the return voyage, they apparently took the study very serious. The sample consisted of 69 male participants (89.7%) and 8 female participants (10.3%). The mean age of the participants was 22.9 years ($SD = 2.2$).

2.2. Measures

We used daily diaries to measure our study variables. All day-level questionnaires were adapted versions of existing scales. We modified the time frame of the scales and the number of questions so the questions could be answered on a daily basis (cf. Ohly et al., 2010).

Day-level job crafting was assessed with the Job Crafting Scale (Tims et al., 2012) as modified and shortened by Petrou et al. (2012) for daily diary research. The scale consists of nine items, i.e. three items for each of the three sub-dimensions of job crafting (increasing resources, increasing challenges, decreasing demands). The original scale has been validated in various samples and across cultures providing evidence for its convergent and criterion validity (for a meta-analysis, see Rudolph et al., 2017). For the present study, some items were adjusted to the military context on board the ship, for example, "On today's shift, I have asked other cadets, civilian crewmembers or military staff for advice" (seeking resources), "On today's shift, I have asked for more responsibilities" (seeking challenges), and "On today's shift, I have made sure that my work is mentally less intense" (decreasing demands). Responses were given on a five-point scale, ranging from 1 (totally disagree) to 5 (totally agree). The average within-level reliability coefficient (Cronbach's alpha) across the 30 days was 0.66, 0.79, and 0.81 for increasing resources, increasing challenges, and decreasing demands, respectively – indicating acceptable to good reliability.

Day-level Playful Work Design was measured with four items from the 12-item scale developed by Scharp et al. (2019). Here are two examples of the slightly adapted items: "Today, I approached my work in a playful way", and "Today, I tried to set time records in my work tasks." (1 = not at all, 5 = to a very large extent). To test the validity of the short scale, we used data collected among 88 employees working in a variety of sectors. The employees filled out a daily diary survey for five consecutive working days – including Scharp et al.'s 12-item version of playful work design (response is 86%; total number of observations is $N = 391$). Slightly more than half of the sample (53.4%) was male, and the majority was highly educated. The mean age was $M = 32.18$ ($SD = 11.13$), and mean organizational tenure was $M = 4.44$ ($SD = 5.24$). The four-item scale used in the present study correlated strongly and positively ($r = 0.66, p < .001$) with the 12-item daily PWD instrument. In addition, the four-item scale correlated positively with the six-item designing fun subscale ($r = 0.55, p < .001$), and with the six-item designing competition subscale ($r = 0.65, p < .001$). Similar correlations were found in two additional surveys ($N = 417$; $N = 302$; Scharp, Bakker, Breevaart, & Kruup, 2020). Specifically, the four-item scale correlated positively with the overall PWD score ($r = 0.68, p < .001$; $r = 0.70, p < .001$), designing fun ($r = 0.53, p < .001$; $r = 0.57, p < .001$), and designing competition ($r = 0.66, p < .001$; $r = 0.68, p < .001$). The two additional studies also provided evidence for the convergent and divergent validity of the playful work design measure. For example, as hypothesized, playful work design correlated positively with personal initiative, curiosity, openness, competitiveness, and playfulness, whereas it was not significantly correlated with procrastination and laziness. In the present study, the average within-level Cronbach's alpha value was 0.94 across the 30 days.

Day-level work pressure was measured with four items referring to quantitative and time pressuring aspects of work. Items were based on a scale developed by Van Veldhoven et al. (2002). The items were following a headline stating "Today, to what extent..." Two example items are, "...did you have to work extra hard in order to complete something?" and "...did you have to work fast?" (1 = not at all, 5 = to a very large extent). The average within-level reliability coefficient (Cronbach's alpha) was 0.89 across the 30 days.

Day-level job performance was measured by asking colleagues to rate the focal employee's job performance. Each cadet was member of a squad of eight persons. The squad members were randomly allocated to one of two assessment groups, in which person A

evaluated B, C, and D; B evaluated A, C, and D; and C evaluated A, B, and D – on a daily basis. Thus, colleagues rated each cadet during each of the 30 days using four adjusted items from Goodman and Svyantek's (1999) task performance scale. Example items are, "Today, the cadet has achieved the objectives of his/her job", and "Today, the cadet has fulfilled all the requirements of his/her job" (1 = totally disagree, 5 = totally agree). In order to estimate inter-rater agreement, we calculated the Average Deviation Index (Burke & Dunlap, 2002) for the scale across the 30 days. The average score for this index was 0.24, indicating high inter-rater agreement.

2.3. Strategy of analysis

Due to the multilevel structure of the data, where the 30 daily measurements (level 1) of the study constructs can be considered to be nested within individuals (level 2), we applied multilevel analyses by using MLwiN 2.20. In the analyses, the level-1 (day-level) predictors were centered on the person mean. To test our hypotheses, we ran three different models. First, we tested a model where the intercept was included as the only predictor (Null model). In the next, Main effects model, we included the explanatory variables (Job crafting and Playful work design), as well as the moderator variable (Work pressure). In the third and final model (Interaction model), the four hypothesized two-way interaction terms were included: increasing resources \times work pressure, increasing challenges \times work pressure, reducing job demands \times work pressure, and playful work design \times work pressure. Subsequent to testing the multilevel models, we conducted simple slope tests for hierarchical linear models in order to examine whether the slopes in the day-level interactions were significantly different from zero (Preacher et al., 2006). The slopes were tested at ± 1 SD for the predictor and moderators, and calculations were based on the asymptotic covariance matrix from the respective multilevel models using R version 3.4.3.

3. Results

3.1. Descriptive statistics

Prior to analyzing the data, we estimated the intra-class correlations (ICC 1) for all study variables. The ICCs for increasing resources, increasing challenges, decreasing job demands, playful work design, work pressure, and job performance were 0.38, 0.30, 0.58, 0.40, 0.32, and 0.29, respectively. These values indicate that most variance was explained at the within-level (between 42% and 71%).

Table 1 shows the means, standard deviations, and correlations between all study variables. Importantly, the overlap between playful work design and job crafting seems limited. For example, the correlation between job crafting in the form of increasing challenge demands and playful work design is only 0.14 at the within-person level, and 0.28 at the between-person level. We conducted a multilevel confirmatory factor analysis (MLCFA) to test how well the three daily job crafting strategies and daily playful work design could be discriminated. Results indicated that the proposed four-factor model fit well to the data, $\chi^2(118) = 400.47$, CFA = 0.97, TLI = 0.96; RMSEA = 0.033, SRMR_{within} = 0.035, SRMR_{between} = 0.069. On the within-person level, factor loadings were in the range of 0.46 to 0.90, while on the between-person level factor loadings were in the range of 0.70 to 0.99. In order to further examine the discriminant validity of the constructs, we tested two alternative measurement models. In the first model, increasing resources and increasing challenges were modeled to load on one factor. The alternative three-factor model showed good fit to the data ($\chi^2(124) = 513.153$, CFA = 0.96, TLI = 0.95; RMSEA = 0.038, SRMR_{within} = 0.040, SRMR_{between} = 0.083), but the chi-square difference test ($\Delta\chi^2 = 112.683$, $\Delta DF = 6$) indicated that collapsing the two factors resulted in a significant worsening of fit. Finally, the initial four-factor model was compared to a one-factor model where all indicators loaded on one latent factor. The one-factor model showed a poor fit to the data ($\chi^2(130) = 3878.256$, CFA = 0.63, TLI = 0.55; RMSEA = 0.115, SRMR_{within} = 0.147, SRMR_{between} = 0.281), and resulted in a substantial increase of the chi-square value compared to the proposed four-factor model ($\Delta\chi^2 = 3477.786$, $\Delta DF = 38$). In sum, MLCFA suggests that the four-factor model fits better to the data than alternative models, indicating that the four concepts can be empirically discriminated on the within- and between-person levels of analyses.

Table 1
Means, standard deviations, and inter-correlations between the study variables.

	M	SD	1	2	3	4	5	6
1. Increasing resources	3.52	0.69	–	0.63**	0.03	0.25*	0.12	0.06
2. Increasing challenges	3.05	0.77	0.49**	–	–0.05	0.28*	0.10	0.19
3. Decreasing demands	2.18	0.80	–0.10**	–0.11**	–	0.05	0.26*	0.04
4. Playful work design	1.59	0.78	0.16**	0.14**	–0.12**	–	0.09	0.30**
5. Work pressure	2.42	0.91	0.24**	0.16**	0.00	0.18**	–	0.00
6. Job performance	3.84	0.44	0.15**	0.15**	–0.13**	0.17**	0.12**	–

Notes. $N = 77$ participants and $N = 2310$ occasions. Correlations below the diagonal are correlations on the within (day) level and correlations above the diagonal are correlations on the between (person) level.

* $p < .05$.

** $p < .01$.

Table 2

Multilevel estimates for models with other-ratings of job performance as dependent variable (day level).

	Null model			Main effects			Interaction model		
	B	SE	p <	B	SE	p <	B	SE	p <
Intercept	3.841	0.028	0.000	3.848	0.027	0.000	3.856	0.027	0.000
Increasing resources				0.035	0.016	0.014	0.033	0.016	0.020
Increasing challenges				0.042	0.013	0.001	0.041	0.013	0.001
Decreasing demands				−0.065	0.014	0.000	−0.067	0.014	0.000
Playful work design				0.068	0.013	0.000	0.075	0.013	0.000
Work pressure				0.037	0.012	0.001	0.040	0.012	0.000
Increasing resources × Work pressure							−0.022	0.023	0.169
Increasing challenges × Work pressure							−0.048	0.019	0.006
Decreasing demands × Work pressure							0.030	0.020	0.067
Playful work design × Work pressure							−0.045	0.019	0.009
Variance and SE level 2 (person) (percentage of total variance)	0.055 (28.9%)	0.010		0.050	0.015		0.050	0.009	
Variance and SE level 1 (day) (percentage of total variance)	0.135 (71.0%)	0.004		0.114	0.004		0.112	0.003	
−2 Log likelihood	2104.153			1622.403			1593.247		

Note. $N = 77$ participants and $N = 2310$ occasions.

3.2. Hypotheses testing

In [hypotheses 1a–c](#), we postulate positive relationships between daily job crafting in the form of increasing job resources, increasing job challenges, and reducing job demands and other-ratings of daily job performance. [Table 2](#) presents the results of the multilevel models. The main effect model reveals significant positive relationships between both job crafting by increasing job resources ($B = 0.035$, $p < .014$) and increasing challenging demands ($B = 0.042$, $p < .001$) on the one hand, and other-ratings of job performance on the other hand. These results support [hypotheses 1a](#) and [b](#). In addition, the results from the main effect model revealed a significant negative association between job crafting in the form of reducing job demands and job performance ($B = -0.065$, $p < .000$). Thus, [hypothesis 1c](#) was supported as well. In [hypothesis 2](#), we hypothesize that daily playful work design is positively related to other-ratings of daily job performance. In support of this hypothesis, the main effect model reveals a positive significant association between playful work design and job performance ($B = 0.068$, $p < .000$). Noteworthy, in addition to the hypothesized main effects, we also find a significant positive association between daily work pressure and other-ratings of daily job performance ($B = 0.037$, $p < .001$) in the main effect model. All in all, the main effect model explained 15.5% of the variation in daily job performance, and the unique explained variance (pseudo R^2) for each of the predictors were 0.2 for increasing resources, 0.5 for increasing resources, 1.2 for decreasing demands, 1.6 for playful work design, and 0.5 for work pressure.

Formally testing the incremental explained variance of playful work design to the three job crafting dimensions, we performed two additional analyses comparing a model strictly including the three job crafting dimensions, to a model including both the job crafting dimensions and playful work design, as predictors of daily performance. The first model revealed significant predictions for each of the job crafting dimensions ($B = 0.056$, $p < .000$; $B = 0.046$, $p < .000$; and $B = -0.072$, $p < .000$, for increasing resources, increasing challenges, and decreasing demands, respectively). The associated variance components were 0.051 on the between-level and 0.117 on the within-level ($2 * \loglikelihood = 1677.024$). The second model showed a significant prediction of playful work design ($B = 0.075$, $p < .000$) in addition to predictions of the three job crafting dimensions ($B = 0.045$, $p < .002$; $B = 0.043$, $p < .000$; $B = -0.063$, $p < .000$, for increasing resources, increasing challenges, and decreasing demands, respectively). The associated variance components for the second model were 0.51 on the between-level and 0.114 on the within level ($2 * \loglikelihood = 1633.807$), explaining 13.5% of the total within-level variance in performance. In sum, the inclusion of playful work design resolved in a significant reduction of the within-level variance component of 0.003 ($\Delta 2 * \loglikelihood = 43.217$, $\Delta df = 1$, $p < .000$, $\Delta \text{pseudo } R^2 = 1.9$), additionally supporting that daily playful work design incrementally to the job crafting dimensions uniquely explains variance in daily work performance.

In order to test the predicted interaction effects of work pressure and the various proactive work behaviors on other-ratings of performance, the hypothesized interaction terms were added to the main effect model in the interaction model. The interaction model explained 1.4% of the variance in daily job performance beyond the direct effect model. In [hypotheses 3a](#) and [3c](#), we hypothesize that daily work pressure positively moderates the relationships between daily job crafting in the form of increasing job resources and decreasing job demands, and other-ratings of daily job performance. Contrary to our hypotheses, these two interaction terms do not significantly explain additional variance in performance (see [Table 2](#)). Estimation of simple slopes for the nonsignificant interaction between daily increasing resources and daily work pressure revealed a small positive, but significant, slope for those reporting low work pressure (Slope = 0.051, $z = 2.074$, $p < .038$), while the corresponding slope for those reporting high work pressure (Slope = 0.015, $z = 0.601$, $p < .548$) was not significant. Moreover, estimation of simple slopes for the nonsignificant interaction between daily reducing demands and daily work pressure revealed a small significant negative slope for both cadets reporting low (slope = -0.091 , $z = 4.255$, $p < .000$) and high (slope = -0.043 , $z = 2.001$, $p < .045$) work pressure. In sum, [hypotheses 3a](#) and [3c](#) were not supported.

In [hypothesis 3b](#), we propose that daily work pressure moderates the relationship between daily job crafting in the form of

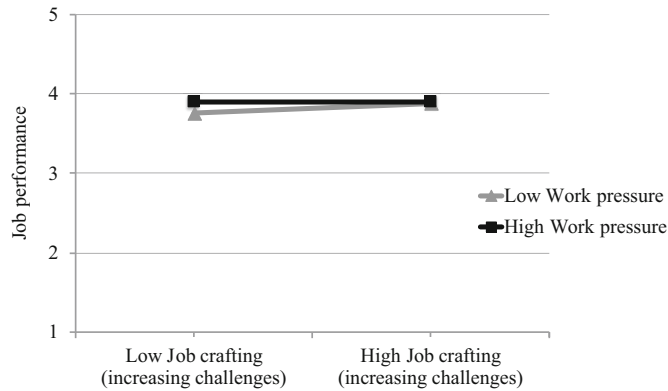


Fig. 1. Job performance as a function of job crafting (increasing job challenges) and work pressure (day level).

increasing job challenges and other-ratings of daily job performance. We predict a negative moderation, implying that this relationship is stronger when work pressure is low (vs. high). In support of [hypothesis 3b](#), the interaction effect of work pressure and job crafting in the form of increasing challenges was significant and negative ($B = -0.048, p < .006$). Estimated pseudo R^2 shows that the interaction term's uniquely explained 0.3% in daily job performance. In order to visually inspect the interaction pattern, the slopes of participants with low ($-1SD$) and high ($+1SD$) daily work pressure are illustrated in [Fig. 1](#).

In accordance with the hypothesized direction of the interaction, the figure shows that for cadets who report low daily work pressure there is a weak positive association between increasing challenges and other-ratings of performance, while such a relationship does not exist among those reporting high work pressure. Additional support was found by testing the simple slopes in the interaction at $\pm 1SD$. The results showed that the positive slope for those reporting low work pressure was significant (Slope = 0.085, $z = 3.882, p < .000$), whereas the slope for those reporting high work pressure was not (Slope = 0.002, $z = 0.121, p = .452$).

Finally, [hypothesis 4](#) proposes that daily work pressure negatively moderates the relationship between daily playful work design and other-ratings of daily job performance. In support of the predicted interaction effect, we find that the playful work design \times work pressure interaction is negative and significant ($B = -0.045, p < .009$) in the interaction model ([Table 2](#)). Moreover, estimated pseudo R^2 shows that the interaction uniquely explains 0.3% of the total daily variance in job performance. A visual representation of the interaction effect is provided in [Fig. 2](#).

In support of our hypothesis, the figure shows that for those with low daily work pressure there is a weak positive relationship between using playful work design and daily other-ratings of performance, while the corresponding slope representing those with high daily work pressure is almost flat. However, simple slope tests revealed that both the positive slope for those reporting a low work pressure (slope = 0.116, $z = 5.048, p < .000$) and the positive slope between daily playful work design and job performance for those reporting high daily work pressure (slope = 0.034, $z = 1.730, p < .0418$) were significant.

3.3. Sensitivity analysis

In order to test the consistency of the hypothesized interactions when taking in to account possible between-person effects across the 30 days, we conducted a sensitivity analysis following the procedure suggested by [Bolger and Laurenceau \(2013, pp. 77–78\)](#). In this procedure, the day-level predictors are separated and isolated into orthogonal between-person components (i.e., average person

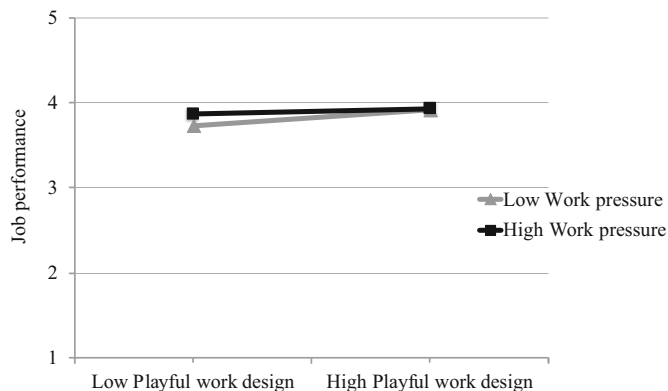


Fig. 2. Job performance as a function of playful work design and work pressure (day level).

level) and within-person components (i.e., fluctuations from person-mean level). As shown in Table 3 reported in Appendix A, the sensitivity analysis revealed almost identical parameter estimates and levels of significance for all interactions tested in our focal analysis ($B = -0.023, p < .159$; $B = -0.048, p < .006$; $B = 0.030, p < .067$; $-0.047, p < .007$, for increasing resources \times work pressure, increasing challenges \times work pressure, decreasing demands \times work pressure, and playful work design \times work pressure, respectively). However, and noteworthy, with the exception of the within-person effect of decreasing demands ($B = -0.092, p < .021$), the sensitivity analysis reveals substantial differences in the hypothesized within-person main effects. The main effects of increasing resources ($B = 0.091, p < .119$), increasing challenges ($B = -0.052, p < .473$), playful work design ($B = -0.048, p < .187$), and work pressure ($B = 0.054, p < .168$) were no longer significant when controlling for their respective between-person components, which may be indicative of inadequate restriction of range (e.g., ceiling and floor effects) in the measurements across the 30 days. The estimated pseudo R^2 values for the model were 18.8 and 16.7, on the between-person level and within-person-level, respectively.

4. Discussion

The present study proposes that individuals may optimize their work design on a daily basis in order to perform well. We theorized that by taking personal initiative, employees could optimize the experience of their work, or adjust their job characteristics to create a better fit with their personal needs/abilities – on a daily basis. The findings of a quantitative daily diary study among naval cadets showed that playful work design, increasing job resources, and increasing challenges, all contributed positively to explaining variance in other-ratings of daily job performance. In contrast, reducing job demands was negatively to job performance. Furthermore, as hypothesized, the effectiveness of some of these strategies depended on daily work pressure. In what follows, we discuss the theoretical and practical implications of the study.

4.1. Theoretical contributions

This study makes four contributions to the literature. A first contribution is that we integrated proactive work behavior (Parker et al., 2010) and JD-R (Bakker & Demerouti, 2017) theories to argue and show that on the days employees use job crafting, they optimize the internal organizational environment, which has favorable consequences for daily job performance. Previous research has shown that individuals who craft their jobs by modifying their job demands and resources experience more meaning, are more engaged, and perform better than those who do not proactively redesign their jobs (Rudolph et al., 2017; Tims et al., 2016). The contribution made by the present study is that it illustrates that individuals perform better on the specific days they make small adjustments in their job. With daily job crafting, employees make subtle, yet meaningful changes to the scope of their work, and experience and accomplish new things. By experimenting with new work interests on a small scale, individuals can reshape their job on a continuous basis. In this way, employees may nourish their work engagement and enjoyment (Demerouti et al., 2015; Petrou et al., 2012; Tims et al., 2014), and achieve their daily work objectives.

Second, we could compare the effectiveness of three different job crafting strategies to improve performance, in addition to playful work design. The findings indicated that expansion-oriented job crafting (increasing job demands and seeking job resources) had positive relationships with other-ratings of job performance. These findings are consistent with the results of previous survey studies focusing on differences between individuals (for meta-analyses, see Rudolph et al., 2017; Lichtenthaler & Fischbach, 2019). This means that the job crafting concept is isomorphic regarding expansion-oriented crafting – increasing job challenges and resources has similar effects at the between- and within-person level. However, reducing job demands had a negative within-person correlation with other-ratings of job performance in the present diary study, whereas the between-person correlation was non-significant in Rudolph et al.'s meta-analysis.

The positive relationship of daily work pressure with other-ratings of job performance suggests that job crafting in the form of reducing job demands (e.g., reducing the number of tasks, limiting the time spent with customers – hence, reducing the work pressure) may also have reduced the challenges of work (see also, Petrou et al., 2012). Thus, although some research has shown that reducing job demands may protect employee well-being (Demerouti et al., 2017), the present findings suggest that this strategy also undermines productivity. Role theory (Katz & Kahn, 1978) posits that organizations function well when individuals enact the roles they are expected to enact. However, when role incumbents proactively change the content or context of their work, they may fail to conform and reject sent role expectations. This may create friction between proactive and less proactive employees and result in conflict (Bolino et al., 2010). Consistent with this theoretical view, Tims et al. (2015) showed that reducing job demands creates arguments with colleagues, and is associated with increased disengagement. Future research should investigate other contexts and different moderators of the reducing demands – job performance relationship – also on a daily basis. Longitudinal research designs may establish whether job crafting in the form of reducing job demands rejects sent role expectations, or is an effortful proactive work strategy in itself (Bakker & Oerlemans, 2019).

A third contribution of this diary study is that we showed that playful work design is a new individual and proactive redesign strategy that employees may use to optimize their work. Playful work design is different from job crafting in that it does not aim at changing the job demands and job resources; rather, playful work design imposes the experiential qualities of play on an activity (Csikszentmihalyi, 1975; Huizinga, 1949) through the use of play elements such as fantasy, humor, and competition (Scharp et al., 2019). Confirmatory factor analyses and correlational analyses in the present study showed that the empirical overlap between both types of proactive work behaviors is indeed limited. Consistent with the literature on proactive work behavior (Parker et al., 2010) and playfulness (Barnett, 2007; Fluegge-Woolf, 2014), we argued that by creating a playful work experience, work becomes a more

meaningful experience and individuals can stay focused and perform well. The pattern of the interaction effect of daily playful work design with work pressure shows that this strategy is particularly important when work pressure is low and when there are few challenges. This is an important finding, because the negative impact of repetitive and monotonous work on well-being and performance has been widely reviewed (e.g., Loukidou et al., 2009; Schaufeli & Salanova, 2014; Tze et al., 2015). Proactively creating a job context in which there is room for fun and humor may foster cohesion in teams that work interdependently to perform well (Robert, 2017; Sandelands, 2010). Also, creating competition may help to set goals and stay focused. Such playful work design strategies help to perform well – on a daily basis. In sum, just like job crafting, playful work design can be positioned in proactivity and JD-R theories as a proactive behavior that generates personal and job resources, and fosters motivation and performance. Future research should further examine the active mechanisms involved in playful work design.

A final contribution is that we tested *when* proactive work strategies are most beneficial. As predicted, job crafting in the form of increasing challenges and playful work design was most important when the work pressure was low. Particularly on the days the work pressure is lower than average, employees may look for more challenges to increase the meaning of work, and be more productive. Moreover, when there is little work to do, employees may want to use playful work design strategies to avoid boredom, stay focused, and be productive (Harju et al., 2016). The finding that job crafting and playful work design are more effective on slow and quiet days is consistent with the notion that these strategies are initiated by the individual and are thus proactive instead of reactive. By proactively changing the work tasks and the psychological experience of work, individuals set goals and connect with others, which makes the work activities more interesting and meaningful (Sonnentag, 2017). When the work is interesting and meaningful, people can satisfy their basic psychological needs by investing all their personal resources in their work tasks, resulting in improved job performance.

Work pressure did not qualify the increasing job resources/reducing job demands – job performance relationships. It could be that high work pressure does not only give a reason to behave in a proactive way (“reason to motivation”; Parker et al., 2010) and seek job resources; work pressure may simultaneously restrict opportunities to effectively mobilize job resources (“can do motivation”). Thus, individuals under work pressure may be more inclined but also less able to craft their jobs. Such opposing forces may mask possible interaction effects. Similarly, on the days individuals are confronted with a high work pressure, they may have immediate reasons to reduce their job demands, but may be less well equipped to redesign their job. Such conditions may diminish the chance of finding an interaction effect between job crafting in the form of reducing job demands and work pressure. The present findings also signal a possible problem with proactive work behavior theory (Parker et al., 2010) – namely that of opposing forces – which needs to be addressed in future research.

Finally, the relationship of reducing job demands with job performance may depend on the specific type of demand that is reduced. In a recent study, Demerouti and Peeters (2018) proposed that instead of minimizing demands (i.e., making a job less strenuous), employees should try to optimize their demands (i.e., making work processes more efficient). Indeed, their diary study showed that whereas optimizing demands was positively related to work engagement, minimizing demands was not. Future research may try to validate the current findings, and expand our research by testing the hypothesis that optimizing job demands frees energetic resources for focal tasks, and is most important for daily job performance when the work pressure is high.

4.2. Limitations and avenues for future research

The present study used a novel sample of naval cadets in a unique setting. Although the findings were generally consistent with our theory-based predictions, a possible limitation is that it remains unknown whether the findings generalize across age groups, genders or other occupational groups. One may argue that the context of naval cadets sailing a ship across the Atlantic Ocean is particularly well suited for studying job crafting and playful work design, because the naval cadets perform many of the work activities for the first time in a real context. However, it should be noted that safely navigating a ship is not a game. High-quality task performance is crucial, because poor performance may have serious consequences. During the voyage, the cadets are constantly challenged to participate and contribute. Furthermore, cadets may take various initiatives, such as suggesting different work processes and methods (e.g., regarding sail maneuvers, maintenance work, work shifts) to leaders and fellow cadets. Although this is a rather specific sample and context, we think that there are several other occupational groups in which comparable conditions may be found, for example, security guards, correction officers, and military police, and individuals in these occupations also seem to have sufficient leeway to engage in job crafting and playful work design. Nevertheless, future research should build on the present findings and test job crafting and playful work design strategies in other settings and cultures.

Second, like in most field studies, we were unable to control the causal ordering of the variables tested. However, we used theories of proactive work behavior to argue that individuals may use various proactive behavioral strategies to improve the internal organizational environment, and to argue that optimized and resourceful work environments lead to higher levels of well-being and performance (Parker & Bindl, 2017; Tims & Bakker, 2010). In addition, as predicted, we found that increasing job challenges and playful work design were most strongly related to job performance when work pressure was low. It would be difficult to argue for a reversed causal relationship where job performance predicts exactly this specific combination of proactive work strategies and work pressure. Nevertheless, job performance may also lead to more job crafting and playful work design, for example when people learn that such strategies help them to get the work done even more effectively, or when job performance fosters the self-efficacy beliefs needed to initiate proactive behaviors (Tims et al., 2014). Future research could test causal and reversed causal effects by evaluating job crafting and playful work design interventions (cf. Oprea et al., 2019), and by following the participants during the weeks they implement their proactive work strategies.

Finally, sensitivity analyses indicated that the main effects of job crafting and playful work design were no longer significant when

controlling for their between-person components. This may be indicative of inadequate restriction of range (e.g., ceiling and floor effects) in the measurements across the 30 days. Future studies with a sufficiently large sample size at the *person* level may want to use broader answer categories and incorporate effects at two levels of analyses. Specifically, when there is theoretical reason to expect invariance across analytical levels, one may consider modeling between-person effects next to within-person effects. In our study, we expected that *daily* work pressure would represent a phenomenon that is phenomenologically different from *general* or more *chronic* work pressure. The latter case may imply continuous exposure to high job demands which leads to chronic job stress or burnout (Demerouti et al., 2001), whereas daily fluctuations in work pressure offer sufficient opportunities for recovery (Demerouti et al., 2009).

4.3. Practical implications

The present diary study confirms that job crafting and playful work design are positively related to job performance. The practical implication of these findings is that managers should offer their employees sufficient leeway to determine – on a daily basis – how work is done. When employees can determine themselves how they do their work, they can choose to modify their job or the psychological experience of work so that it becomes more meaningful and engaging. Because job crafting and playful work design are bottom-up job redesign strategies with important implications for individual employees, managers may consider encouraging such proactive strategies next to top-down initiatives to improve the work environment (cf. Wang et al., 2017).

Moreover, HR departments or consultancy agencies may use the present insights to optimize proactive work behavior interventions, in which employees learn to proactively optimize their job demands, resources, or their personal experience of work (e.g., Gordon et al., 2018; Van Wingerden et al., 2017). In such trainings, employees may develop a personalized job crafting plan, in which they formulate specific job crafting goals. The current findings indicate that these goals may refer to small steps an employee makes to change elements in the work content and context. The results further suggest that employees may brainstorm about possible creative and playful work design strategies that help to stay focused and perform well. A combination of top-down and bottom-up job redesign approaches seems most likely to yield favorable results for employees and organizations at large (Bakker & Demerouti, 2017).

5. Conclusion

The present study suggests that making small adjustments in one's work environment may foster job performance. Proactively seeking job resources and job challenges, as well as engaging in playful work design seems to help to perform better on a daily basis. Seeking challenges and designing work to be playful seem to work particularly well on quiet days – when the work pressure is low. However, reducing job demands is not a good strategy to improve performance, also not when work pressure is high. Thus, our study suggests that job crafting and playful work design are important strategies that supervisors and managers may want to encourage in order to improve organizational functioning.

CRedit authorship contribution statement

Arnold B. Bakker: Conceptualization, Methodology, Writing - original draft, Formal analysis. **Jørn Hetland:** Conceptualization, Methodology, Data curation, Writing - original draft, Formal analysis. **Olav Kjellekvold Olsen:** Investigation, Resources, Writing - review & editing. **Roar Espevik:** Investigation, Resources, Funding acquisition, Writing - review & editing. **Juriena D. De Vries:** Writing - review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Table 3
Sensitivity analysis including between-person mean scores for all predictors.

	Interaction model		
	B	SE	p <
Intercept	3.856	0.025	0.000
Between-person increasing resources	−0.058	0.075	0.220
Between-person increasing challenges	0.093	0.075	0.108
Between-person decreasing demands	0.025	0.043	0.281
Between-person playful work design	0.123	0.052	0.009

(continued on next page)

Table 3 (continued)

	Interaction model		
	B	SE	p <
Between-person work pressure	−0.014	0.055	0.399
Within-person increasing resources	0.091	0.077	0.119
Within-person increasing challenges	−0.052	0.076	0.473
Within-person decreasing demands	−0.092	0.045	0.021
Within-person playful work design	−0.048	0.054	0.187
Within-person work pressure	0.054	0.056	0.168
Increasing resources × Work pressure	−0.023	0.023	0.159
Increasing challenges × Work pressure	−0.048	0.019	0.006
Decreasing demands × Work pressure	0.030	0.020	0.067
Playful work design × Work pressure	−0.047	0.019	0.007
Variance and SE level 2 (person)	0.045	0.008	
Variance and SE level 1 (day)	0.112	0.003	
−2 Log likelihood	1584.941		

Note. $N = 77$ participants and $N = 2310$ occasions.

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