



The duality of playful work design: A diary study of designing fun and competition

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ABSTRACT

Although employees often have limited control over task assignments, schedules, or collaboration partners, they may still have discretion in how they carry out tasks. Building on Job Demands-Resources theory, we integrate information-processing perspectives of play to propose that playful work design – proactively adding elements of fun and competition to routine activities – can be useful even in tightly structured jobs by increasing activated positive affect and reducing exhaustion. We tested this proposition in a 20-day diary study among 57 Norwegian naval cadets, yielding 1,046 day-level observations, using multilevel structural equation modeling. On days when cadets designed their work playfully, they reported more activated positive affect and less exhaustion. Combining designing fun with designing competition amplified these benefits. Thus, small discretionary choices in how employees approach work may produce immediate well-being gains in low-discretion roles and offer a micro-level pathway through which play at work can support performance.

1. Introduction

Over the past two decades, organizational psychology has shifted from treating employees as passive recipients of job design to seeing them as active agents of change (Parker et al., 2017). This perspective recognizes that individuals can shape their work through bottom-up initiatives, such as job crafting (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001), idiosyncratic deals (Hornung et al., 2009), and job change negotiation (Ashford & Black, 1996). This surge of research has deepened our understanding of personal agency at work, yet it often assumes levels of discretion and organizational support that many jobs simply do not provide (Hornung et al., 2010). Assembly-line workers, security officers, military personnel, call-center agents, fast-food crew, and warehouse packers typify tightly scripted, rule-bound,

interdependent jobs with minimal discretion over tasks, timing, and with whom they work. Yet, even under such constraints, individuals retain the freedom to approach and perform tasks in their own way.

Even in tightly scripted work, the discretion we retain in interpreting information and enacting tasks leaves room for play (Scharp et al., 2019, 2023). Although play is often cast as the antithesis of work – especially highly structured work – this view overlooks the subtle but consequential ways people can weave play into even tightly constrained jobs (Dandridge, 1986; Roy, 1959). This is explained by the information processing account of play (Andersen et al., 2023; Petelczyc et al., 2018; Rosch, 1978). In essence, this view of play is built on a few straightforward propositions. The core premise is that information processing depends on how actors categorize an activity – work versus play – which determines the goals pursued, cues attended to, and rules applied

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(Sandelands, 1988). A second premise is enactment: by behaving as if an activity is playful, actors construct a corresponding reality that organizes experience (Mainemelis & Ronson, 2006). A corollary follows: these cognitive and enactment processes mobilize activating energy – curiosity, persistence, and flexible coordination – that supports performance (Glynn, 1994). Hence, even in jobs with limited decision latitude, employees can initiate play by reframing routine tasks and enacting small, playful moves.

We integrate the information-processing perspective of play with Job Demands-Resources (JD-R) theory to explain how the dual facets of playful work design contribute to well-being and task performance. Playful work design refers to the proactive integration of play with work activities to promote positively valenced states (Bakker, Scharp, et al., 2020; Scharp et al., 2023). Our core argument is that playful work design represents a micro-level proactive mechanism through which employees modify the motivational meaning of their work. Specifically, designing fun directs attention toward opportunities to create resources, whereas designing competition directs attention toward opportunities to create challenge demands. This integration explains how employees may generate motivational resources and challenges even in constrained work settings where formal task structures are difficult to change.

The duality of playful work design refers primarily to its conceptual structure: playful work design comprises two distinguishable dimensions—designing fun and designing competition—that represent different ways employees proactively change the experience of work (Bakker & Scharp, 2025). Designing fun is primarily resource-enhancing because it involves creating or identifying enjoyable aspects of work, whereas designing competition is primarily challenge-demand-increasing because it involves construing work activities as challenges to be mastered. Although conceptually distinct, these two dimensions are functionally complementary because they orient employees toward different motivational processes. When enacted together, they may therefore produce synergistic effects beyond their individual contributions. Accordingly, we propose that when employees engage in designing fun and designing competition, they may enhance their daily task performance indirectly through improvements in well-being (i.e., activated positive affect, reduced exhaustion). The boosting hypothesis of JD-R theory (Bakker, Demerouti et al., 2023) further suggests that designing fun and designing competition are not only complementary but also mutually reinforcing strategies: each triggers feedback loops that magnify the other's motivational impact (cf. Bakker & Scharp, 2025).

The purpose of the present study is to investigate the extent to which proactively changing *how* tasks are approached and performed benefits individuals, even in settings that are relatively rigid and hierarchical. One problem is that significant differences exist between occupations in what latitude entails (Morgeson & Humphrey, 2006). Another issue concerns the volatile nature of information processing, which fluctuates rather than remains uniform within individuals. Indeed, even in highly structured environments, people differ from day to day in the cognitive and emotional energies they invest in their work. To address these issues, we conducted daily diary research for 20 days among a sample of naval cadets responsible for navigating a tall ship from Northern Europe to North America. The work on board a ship is highly structured and at times repetitive and monotonous. This setting offers a rigorous platform for examining task-level adaptations in work execution under constraints. Our approach resonates with other researchers who sampled specific settings to draw useful implications for a broad range of occupations, including Grant (2008), who studied municipal firefighters to investigate the role of prosocial and intrinsic motivation in persistence, and Bass et al. (2003), who studied leadership styles in relation to cohesion and performance.

Our research contributes to knowledge about play at work in several ways. First, we integrate an information-processing perspective into the motivational process of JD-R theory to specify the mechanisms through which playful work design affects task performance. This is important

because existing frameworks emphasize the hedonic qualities or the role of play in resource regulation without articulating the cognitive and emotional mechanisms that give rise to such outcomes (Van Vleet & Feeney, 2015). By conceptualizing and empirically demonstrating that designing fun and designing competition function as resource-enhancing and challenge-demand-increasing strategies, respectively, we lay the groundwork for more differentiated theorizing about play at work. In doing so, we respond to calls for more theory-driven accounts of how play at work influences employee outcomes and extend prior research by clarifying the distinct mechanisms through which its dimensions exert their effects (Petelczyc et al., 2018; Proyer & Sendatzki, 2026).

Second, we challenge the notion that play hinders organizational efficiency (Ford, 1922) and identify two mechanisms that explain how playful work design translates into performance. The extant literature has predominantly focused on positively valenced constructs as explanatory variables (Celestine & Yeo, 2021), while evidence for links between playful work design and exhaustion has been inconsistent (Bakker & Van Wingerden, 2021; Scharp et al., 2023). Our findings highlight that designing fun benefits perceived task performance by increasing activated positive affect and reducing exhaustion, whereas designing competition benefits task performance only through activated positive affect. These findings provide a more balanced understanding of how playful work design relates to performance (Proyer & Sendatzki, 2026).

Third, we advance our understanding of playful work design by revealing that its dimensions are not merely independent strategies but mutually reinforcing ones. Designing fun and designing competition are often conceptualized and tested as separate work design strategies – fun as a means of increasing job resources, and competition as a way of amplifying challenge demands – despite their potential interdependence (Bakker, Scharp, et al., 2020). Indeed, everyday forms of play and games often incorporate both to maximize outcomes (Salen & Zimmerman, 2003; Schell, 2020). Based on JD-R theory, we argue and find that designing fun and designing competition especially benefit proximal outcomes when enacted in concert. In doing so, we respond to calls to examine the multiplicative effects of the dimensions of playful work design and extend this line of research (Bakker & Junker, 2025; Bakker & Scharp, 2025; Scharp et al., 2022).

2. Theory and hypotheses

2.1. Contextualizing play to work: Playful work design

Playful work design concerns a specific form of play at work that builds on the literature of work design and play (Scharp et al., 2023). Work design comprises both top-down organizational and bottom-up initiatives to change the content and organization of tasks (Parker et al., 2017). Playful work design builds on this idea and integrates it with insights from play literature. Play at work constitutes an “activity undertaken in a work context that is interactive in nature and undertaken with the goal of having fun” (Celestine & Yeo, 2021, p. 253). Whereas play at work as a diversion directs attention away from tasks, play at work embedded in work *channels* attention and focus towards tasks (Mainemelis & Ronson, 2006). The proactive use of the latter exemplifies playful work design: initiating and utilizing play during work activities to reshape their content, organization, and experience.

Two forms of play inform the dimensionality of playful work design (Huizinga, 1938; Scharp et al., 2023). Designing fun involves ludic play described by spontaneity, humor, and fantasy to promote fun, entertainment, and joy, which is typically more social and creative. Designing competition concerns agonistic play characterized by rules, competition, and challenges to promote a sense of drive, challenge, and achievement. To illustrate, naval cadets may design fun by singing songs in rhythm with the hard manual labor that often takes many hours (e.g., manning the braces, setting the sails), whereas adding a micro-goal to a task, such

as monitoring and striving to reduce their heartbeat and maintain calmness while climbing the mast, exemplifies designing competition. Both forms of play are described by attentional processes that create a unique sensitivity to and engagement with information received during task execution. Although some studies treat playful work design as a single composite construct (e.g., Hoang & Le, 2024), distinguishing between designing fun and designing competition may uncover distinct effects as well as meaningful interaction patterns between these dimensions.

2.2. Playful work design from an information-processing perspective

The attentional processes involved in play are fundamental to our theorizing as to why the dimensions of playful work design facilitate unique changes in activated positive affect and exhaustion. These two forms of well-being can be described in terms of activation and valence (Russell & Carroll, 1999). While activated positive affect at work, such as excitement and cheerfulness, is high in activation and pleasant, exhaustion is low in activation and unpleasant (Bakker & Oerlemans, 2011). When individuals approach and perform tasks as opportunities for play, they adopt a unique cognitive frame that changes how information is processed and activities are evaluated. This process – often termed personal construction or enactment – posits that the behaviors people enact influence what they perceive and regard as meaningful (Salancik & Pfeffer, 1978). For play in particular, people become especially sensitive to positive information that signals potential for engagement and highlights enjoyable aspects (Cellar & Barrett, 1987; Rosch, 1978; Webster & Martocchio, 1992). Experimental studies (e.g., Glynn, 1994; Sandelands, 1988) show that subtle cues – such as playfully reframing an activity – can raise the motivational pull of means-focused information (vs. ends), boost intrinsic motivation, and prompt people to broaden their experience by reorganizing how they act.

Thus, through play, individuals become more responsive to information that promotes activated positive affect, whereas attention is diverted away from cues fostering exhaustion (Salancik & Pfeffer, 1978; Sandelands, 1988; Weick et al., 2005). For example, when employees design fun and design competition, they deliberately create playful moments – humor, spontaneity, small creative twists – and set micro-goals, challenges, or friendly contests that produce a sense of progress and achievement (Scharp et al., 2023). Consider a hospital nurse in a tightly structured role – rounds, procedures, documentation. Even here, playful work design is possible by treating each encounter as a micro-game. The nurse might exchange light humor when appropriate, craft brief narratives to make sense of interactions, and attune to cues that a patient welcomes playfulness – often prompting an extra follow-up question that improves care. In parallel, the nurse can set micro-challenges – remember every name on the ward, anticipate likely diagnoses, or aim for flawless handovers. These self-created goals deliver immediate feedback and small wins, elevating activated positive affect and shifting attention away from fatigue. In short, reframing structured tasks as opportunities for fun and challenge allows even low-discretion work to activate and change resources and demands to sustain performance.

2.3. Playful work design in Job-Demands resources theory

Job-Demands Resources (JD-R) theory (Bakker, Demerouti et al., 2023; Demerouti & Bakker, 2026) contextualizes the processes involved in designing fun and designing competition. JD-R theory is a unifying job design theory that explains why and when employees prosper and perform better. A core premise of the theory is that proactively optimizing resources and demands benefits performance because well-being improves. This is also known as the motivational process. In this framework, resources and demands can stem from both the job and the individual. Job resources refer to aspects of the job that have motivational potential, facilitate goal achievement, stimulate growth, and

reduce the costs associated with demands (Bakker & Demerouti, 2007), whereas aspects of the self that provide a sense of control and competence constitute personal resources (Xanthopoulou et al., 2007). Contrastingly, job demands comprise aspects of work that require sustained effort and therefore relate to costs (Demerouti et al., 2001). Similarly, personal demands refer to the requirements individuals set for their behavior that lead to investment and therefore costs (Barbier et al., 2013; Scharp & Bakker, 2025). When job and personal demands are experienced as challenges rather than hindrances, they can trigger the motivational process (Bakker & Demerouti, 2017).

While we recognize that both dimensions of playful work design can activate and shape resources as well as demands (cf. Costantini et al., 2026; Scharp et al., 2022), we argue that designing fun primarily functions as an increasing resources strategy, whereas designing competition operates as an increasing challenge demands strategy. To illustrate, when individuals design fun, they especially become more attuned to information about existing or potential job and personal resources. They may notice amusing incongruities between imagination and reality or subtle cues from a colleague that indicate a receptivity to humor – each signifies a shift towards positively valenced information and enacting behavior that creates positive feedback loops. In other words, they may notice and develop resources such as social support, variety, feedback, self-efficacy, and cognitive flexibility. Similarly, when designing competition, individuals become more responsive to information about existing or potential challenging job and personal demands. They may recognize that the actions involved in task execution provide indicators of goal progress, quality, and room for developing personal rules and objectives that trigger the iterative optimization of behavior. This may lead to challenge demands, such as task complexity, self-competition, deadlines, a drive for mastery, and performance expectations. By activating and shaping resources and demands, playful work design instigates the motivational process, leading to improved well-being (Bakker, Demerouti et al., 2023).

There is field and experimental research that supports the idea that on days when individuals design fun and competition, they experience more activated positive affect and less exhaustion. Utilizing a heterogeneous sample of employees, Scharp et al. (2023) found that colleagues evaluated individuals who engaged in these strategies as more vigorous, enthusiastic, and absorbed (i.e., work engagement; Schaufeli & Bakker, 2022) than their less playful counterparts. Daily diary studies show why playful work design boosts engagement: designing fun tunes people to autonomy and connection, while designing competition steers attention to achievement opportunities alongside autonomy (Bakker, Breevaart, et al., 2023; Scharp et al., 2022). Finally, previous cross-sectional research on playful work design and exhaustion was inconclusive (cf. Scharp et al., 2023), and a time-separated study found that designing fun, but not designing competition, negatively predicted exhaustion two weeks later (Bakker & Van Wingerden, 2021). However, we argue that these findings stem from investigating differences *between* individuals as opposed to fluctuations in daily exhaustion *within* individuals, which is more aligned with the volatile information-processing nature of play.

While there is no experimental research on playful work design, several experimental studies support our reasoning that approaching and performing tasks playfully benefits activated positive affect and reduces exhaustion (Cellar & Barrett, 1987; Glynn, 1994; Rosch, 1978; Sandelands, 1988; Webster & Martocchio, 1992). To illustrate, in two laboratory studies among students, Cheng and Wang (2015) studied the extent to which humor would promote activated positive affect despite being exhausted. Individuals were first exposed to a task known to induce exhaustion. Subsequently, the intervention group watched videos involving humor, whereas the control group watched an educational video. Across studies, individuals who were exposed to humor reported more activated positive affect and persevered longer on subsequent tasks. Playful work design builds immediate, intrinsic rewards into the task itself, which can raise activated positive affect and curb exhaustion. Consistent with this mechanism, a lab study showed that

after prolonged work, adding clear rewards restored engagement and reduced fatigue (Hopstaken et al., 2015). Therefore, we predict:

Hypothesis 1: Daily designing fun is (a) positively related to daily activated positive affect and (b) negatively associated with daily exhaustion.

Hypothesis 2: Daily designing competition is (a) positively related to daily activated positive affect and (b) negatively associated with daily exhaustion.

2.4. From playful work design to performance

The motivational process in JD-R theory suggests that the benefits of designing fun and designing competition extend beyond activated positive affect and reduced exhaustion to enhanced task performance (Bakker & Demerouti, 2024; Bakker, Demerouti et al., 2023). Namely, playful work design entails active engagement with additional action opportunities that emerge when tasks are approached and performed playfully (Bakker, Scharp, et al., 2020; Bakker & Scharp, 2025). We propose that playful work design – by elevating activated positive affect and reducing exhaustion – deepens and sustains engagement in task execution. Consequently, this playful approach to work prevents a decline in task performance and enables individuals to remain vigilant in a context that would otherwise invite disengagement and fatigue (Csikszentmihalyi, 1975). Similarly, Beal et al. (2005) argued that task performance partly depends on the extent to which tasks interest employees and can draw their attention. For example, a security screener at an airport may imagine amusing narratives for items in luggage or try to predict what the highlighted shapes on the scanner represent. Consequently, each bag becomes an opportunity for discovery and immediate feedback, which enables them to sustain the attentional focus and vigilance that are key to task performance. Indeed, individuals who approach and perform work playfully are evaluated by colleagues as better performers (Bakker, Hetland, et al., 2020a; Scharp et al., 2023).

While research on activated positive affect and exhaustion as mechanisms between playful work design and task performance is limited, some research supports this pathway (cf. Scharp et al., 2021). For example, a cross-sectional study found that playful work design was positively related to task performance through flow (Urbini et al., 2025). Yet, in two cross-sectional studies, Caracuzzo et al. (2024) found that designing competition, but not designing fun, was positively associated with task performance through work engagement. In addition, a time-separated study found that individuals who designed competition performed better one month later due to being more engaged with work, whereas this association was only significant for designing fun when individuals felt that time passed very slowly and that the day never ended (i.e., boredom; Dishon-Berkovits et al., 2024). Hence, especially in the context of work that is highly structured, hierarchical, and interdependent, both dimensions of playful work design may exert indirect effects on task performance.

Hypothesis 3: Daily designing fun promotes performance through (a) increasing daily activated positive affect and (b) decreasing daily exhaustion.

Hypothesis 4: Daily designing competition promotes performance through (a) increasing daily activated positive affect and (b) decreasing daily exhaustion.

2.5. The duality of play: multiplicative effects

One central proposition in JD-R theory is that employees experience optimal levels of well-being and perform best when they work in jobs that combine high challenge demands with high resources (Bakker et al., 2007; Breevaart & Bakker, 2018). Work is particularly engaging when employees face deadlines and encounter complex work problems, while simultaneously having access to job and personal resources that help deal with these challenges (Tadic et al., 2015). Building on this, we propose that designing fun and designing competition amplify each

other's motivational potential, because one is primarily resource-enhancing and the other more challenge-creating. While designing fun facilitates the recognition and enactment of opportunities for connectedness and divergent thinking, designing competition restructures activities with clear objectives to pursue and invest these resources in (Scharp et al., 2022; 2023). Used together, the strategies are synergistic, strengthening the link with performance through well-being. For instance, a cashier who treats each interaction as a small challenge to elicit a smile typically feels more energized and less exhausted than when relying on either approach alone (Bakker & Scharp, 2025).

This resonates with the general principles of game design (Salen & Zimmerman, 2003; Schell, 2020). Indeed, games – from board to video – typically blend ludic (playful narrative, exploration) and agonistic (goals, challenges) elements, acting as resources and demands. The story hooks attention and emotion, while micro-objectives structure progress and competition; together, they sustain engagement. While research on this specific amplification effect is limited, four experiments by Tauer and Harackiewicz (2004) produced results aligned with our reasoning. Namely, the authors compared cooperation, competition, and a combination of cooperation and competition in terms of enjoyment and performance. The authors argued that integrating both elements is more reflective of the real world and more beneficial for motivation and performance because it activates complementary and reinforcing processes. They found convincing evidence that the combination of social and competitive elements led to greater enjoyment and better task performance than either pure cooperation or pure competition. Moreover, one of the studies revealed that enjoyment partially mediated the effect of this condition on task performance.

In addition, several studies indicate that combining different proactive work strategies can produce synergistic effects on well-being. For example, in a daily diary study, Zacher et al. (2015) found that the daily prioritization of important work goals (selection) and the investment of resources to achieve them (optimization) was most effective in promoting work engagement when enacted together. Similarly, in a time-separated study, proactively reducing hindering job demands decreased work engagement on its own (Seppälä et al., 2020). However, when this strategy was combined with seeking out additional challenging job demands, it actually increased work engagement. Finally, research by Pap et al. (2022) also suggests that combining strategies may produce synergistic effects. The authors found that the daily positive association between proactive vitality management and work engagement was strongest among individuals who proactively used their strengths at work. Building on these studies and JD-R theory, we expect that on days when individuals combine designing competition with designing fun, their task performance will increase especially. Namely, the joint enactment of designing fun and designing competition is expected to have a stronger positive effect on activated positive and a negative effect on deactivated negative affect than when either strategy is used in isolation.

Hypothesis 5: Designing competition amplifies the indirect association between designing fun and performance by strengthening (a) the positive relationship with activated positive affect and (b) the negative association with daily exhaustion.

3. Method

3.1. Procedure and Participants

We approached a group of 63 naval officer cadets (sub-lieutenants) from the Royal Norwegian Naval Academy. In accordance with the university's data management regulations, the project did not require formal ethical clearance because it neither involved the processing of personal data nor addressed health-related issues. Prior to data collection, the consent form and questionnaires were registered and approved by the Norwegian Centre for Research Data. The consent form specified that participation was entirely voluntary and that cadets could withdraw

at any time without providing a reason. The study adhered to the ethical principles of the Norwegian National Research Ethics Committees (www.forskningsetikk.no) and received approval from the Norwegian military ethics committee.

As part of their leadership training, the cadets embarked on an eleven-week tall ship voyage from Northern Europe to North America. This voyage took place just before the COVID-19 pandemic in Europe, between January and February 2020. During the voyage, the cadets participated in various work tasks, including sailing maneuvers, safety drills, and maintenance of the ship, organized in four-hour shifts. Other daily work activities included navigating, rig climbing, following lectures, cleaning the deck, keeping the night watch, and preparing documentation to go on land. All 63 invited cadets agreed to participate in the daily survey. However, six cadets who responded on fewer than 10 of the 20 days were excluded from the final sample ($n = 57$), yielding an overall response rate of 90.5%. All the participants received personalized reports regarding their playful work design, well-being, and performance when they returned to Norway.

Participants were requested to complete short daily paper-and-pencil surveys just before supper at 5p.m. each day over a period of 20 consecutive days. This time was chosen because all cadets were awake and available. They were encouraged by their squadron leader to participate each day. The survey included short scales to assess playful work design, activated positive affect, exhaustion, and task performance. The final sample included 44 males (77.2%) and 9 females (12.8%). The sample was relatively young – age ranged between 19 and 26 years ($M = 21.5$ years, $SD = 1.9$). The daily response rate was high, with an average of 91.8% across days (1,046 out of 1,140 measurement points). Missing values were handled using FIML estimation in Mplus 7.4.

3.2. Measures

All study variables were measured using short daily surveys. In line with recommendations for diary research (Ohly et al., 2010), we used validated short scales adapted to the day level. To estimate the internal consistency, we calculated multilevel omega reliability estimates, because they provide a more accurate estimate of reliability than the traditional alpha coefficient (Geldhof et al., 2014).

3.2.1. Daily playful work design

The dimensions of playful work design were assessed using the daily instrument developed by Scharp et al. (2019; 2023). This instrument includes six items for measuring designing fun (e.g., “Today, I looked for ways to make tasks more fun for everyone involved”, and “Today, I looked for humor in the things I needed to do”), and another six items for measuring designing competition (e.g., “Today, I approached my job as a series of exciting challenges”, and “Today, I competed with myself at work – not because I had to, but because I enjoyed it”). Participants were asked to indicate the extent to which they agreed with these statements (1 = *totally disagree*, 5 = *totally agree*). The reliability coefficients of the two subscales were acceptable at the within-person level and good at the between-person level for designing fun ($\omega_{\text{within}} = 0.69$, $\omega_{\text{between}} = 0.97$) and designing competition ($\omega_{\text{within}} = 0.68$, $\omega_{\text{between}} = 0.88$).

3.2.2. Daily activated positive affect

We measured activated positive affect with the three-item IWP Affect Questionnaire (Warr & Parker, 2010), which has been validated in a daily diary study by Bakker et al. (2019). The items were introduced with the stem: “At the present time, I feel...”. The three adjectives were ‘enthusiastic’, ‘inspired’, and ‘excited’. The selection of the items was made based on face validity. Participants could indicate the frequency of experiencing these daily emotions using a five-point scale ranging from 1 (*not at all*) to 5 (*almost all of the time*). The scale demonstrated low reliability at the within-person level of analysis ($\omega_{\text{within}} = 0.55$), while the between-person level Omega was good ($\omega_{\text{between}} = 0.94$). Therefore,

any within-person effects we report should be considered conservative and underestimated due to measurement error (Yang et al., 2022). However, due to the low within-level omega, we calculated Cronbach’s alpha for each day separately. The daily alphas varied from 0.74 to 0.89, except for day two, where the alpha was 0.18. The average alpha across the 20 days was 0.80. It is therefore likely that the low estimated within-level omega was primarily driven by the unusually low reliability on a single day.

3.2.3. Daily exhaustion

To assess daily exhaustion, three items of the eight-item exhaustion subscale of the Oldenburg Burnout Inventory (Demerouti et al., 2010) were chosen based on their factor loadings and face validity (for a similar approach, see Demerouti et al., 2015). Example items are: “Today, I felt emotionally drained from my work” and “Today, I felt used up at the end of the workday”. The statements could be answered on a 5-point scale (1 = *totally disagree*, 5 = *totally agree*). The scale demonstrated good reliability at both levels of analysis ($\omega_{\text{within}} = 0.81$, $\omega_{\text{between}} = 0.96$).

3.2.4. Daily self-rated task performance

We measured daily task performance with four adjusted items from Goodman and Svyantek’s (1999) task performance scale. This shortened scale has been validated in previous diary studies (Bakker, Hetland, et al., 2020a; Sørlie et al., 2022). Example items are: “Today, I have achieved the objectives given to me” and “Today, I have fulfilled all the requirements of my job” (1 = *totally disagree*, 5 = *totally agree*). The scale demonstrated good reliability at within- ($\omega_{\text{within}} = 0.80$) and between-person level of analysis ($\omega_{\text{between}} = 0.95$).

3.3. Strategy of analysis

The data have a two-level structure because the 20 daily measurement occasions (level 1) of the study variables were nested within individuals (level 2). To adequately model the multilevel structure of these data, we conducted multilevel analyses with random intercepts using Mplus 7.4 (Muthén & Muthén, 2017). Since our primary aim is to test within-person associations, our analytical approach aims to improve the estimation of these coefficients. Specifically, we followed the procedures to separate and isolate predictors into orthogonal between-person components (i.e., average person level) and within-person components and centering at the grand- and person-mean, respectively (Antonakis et al., 2021; Bolger & Laurenceau, 2013). In addition, we controlled for the autoregressive effects of our outcome variables. By modeling all hypothesized associations on both levels, including lags, we obtain more accurate parameter estimates, which implies the coefficients represent changes in activated positive affect, exhaustion, and task performance (Enders & Tofghi, 2007; Wilkins, 2018).

To test our hypotheses, we specified two models. First, we examined the hypothesized model, which included all proposed relationships and the covariances between mediators (see Fig. 1). Our primary focus was on concurrent within-person associations. Although the 20-day diary design enabled the examination of lagged effects of playful work design, our theoretical interest centered on immediate day-level processes rather than carryover effects. Specifically, playful work design reflects a proactive, work-embedded strategy through which employees playfully reinterpret and enact ongoing tasks to make them more enjoyable and challenging. Accordingly, the effects of designing fun and designing competition are expected to manifest in same-day changes in activated positive affect and exhaustion. Second, we tested an alternative model that also included *direct* effects between the predictors and the outcome (task performance). Since the hypotheses pertain to within-level associations, the study is sufficiently powered with a sample size of 1,046 (Snijders & Bosker, 2012). In addition, Preacher et al. (2011) suggest that the multilevel structural equation model’s power to detect a relatively small indirect effect of 0.10 is acceptable for intraclass coefficients

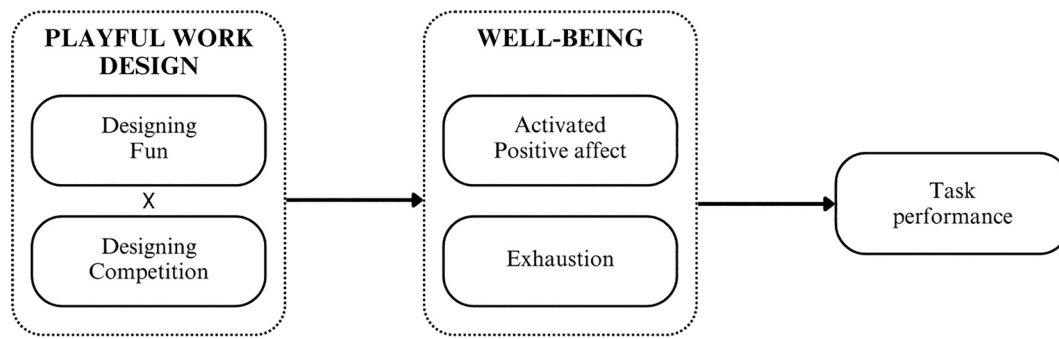


Fig. 1. Proposed Theoretical Model.

(ICC) greater than 0.20.

To determine the fit of the models, we used a range of goodness-of-fit indices: Chi-square, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Values that exceed 0.90 for the CFI and TLI, RMSEA values below 0.08, and SRMR values below 0.10 are indicative of an acceptable fit between the hypothesized model and the data (Schweizer, 2010). The significance of indirect effects was tested by estimating confidence intervals using Monte Carlo simulations in R.

Finally, simple slope tests were conducted to examine whether the slopes in the potential day-level statistical interactions were significantly different from zero. The slopes were tested at ± 1 SD for predictor and moderator, and calculations were based on the asymptotic covariance matrix from the final multilevel model. Indirect conditional effects were also formally tested at ± 1 SD for the predictor and moderator as additional parameters in the final model. Witt (2019) has argued that researchers should maximize congruence between the visual size of an effect and the actual size of the effect. Following her recommendations, we present standardized effects, where the y-axis range is 1.5 standard deviations. We cover 87% of the variance in the dependent variable.

4. Results

4.1. Descriptive Statistics

Table 1 shows the means, standard deviations, and correlations between all study variables. Prior to the multilevel modeling, we estimated intraclass correlations (ICCs) for the three dependent variables. The estimated ICCs for activated positive affect, exhaustion, and self-rated task performance were 0.50, 0.51, and 0.27, respectively. Hence, there was sufficient day-level variance to be explained by our hypothesized day-level predictors. Moreover, the estimated variance inflation factor (VIF) between designing fun and designing competition was 1.001, indicating that multicollinearity is unlikely to bias the interaction effect.

4.2. Measurement models

Prior to testing the hypothesized multilevel model, two competing

multilevel CFAs were evaluated. In the five-factor model, each of the five study constructs was represented by its respective indicators. The hypothesized overall model fit was good ($\chi^2 = 1021.47$, $df = 398$; RMSEA = 0.038; CFI = 0.910, SRMR_{within} = 0.040, SRMR_{between} = 0.089) and outperformed a four-factor model that specified playful work design as a single factor ($\chi^2 = 1446.85$; $df = 406$; RMSEA = 0.038; CFI = 0.91, SRMR_{within} = 0.050, SRMR_{between} = 0.159; $\Delta\chi^2 = 436.38$; $\Delta df = 8$, $p < 0.001$), which provides evidence for construct validity (Conway & Lance, 2010).

4.3. Hypothesis testing

We started with testing the proposed multilevel indirect effects model. This model fitted well to the data ($\chi^2 = 33.71$, $df = 21$, CFI = 0.98, TLI = 0.95, RMSEA = 0.022). To further assess whether the hypothesized model is appropriate, we tested an alternative model that also included the direct associations between playful work design and task performance. While the alternative model also fits well to the data ($\chi^2 = 22.95$, $df = 15$, CFI = 0.99, TLI = 0.96, RMSEA = 0.022), none of the additional paths were significant, nor did their inclusion improve model fit $\Delta\chi^2 = 10.76$, $\Delta df = (6, n.s.)$. Taken together, these findings support the validity of the hypothesized model (see Table 2 and Fig. 2).

Table 2
Standardized Parameter Estimates and Confidence Intervals for Hypothesized Direct Effects.

Direct Effect	95% Confidence Interval			
	β	Low	High	p
Designing fun $\rightarrow$ Positive affect	0.207	0.156	0.259	0.001
Designing fun $\rightarrow$ Exhaustion	-0.135	-0.188	-0.082	0.001
Designing competition $\rightarrow$ Positive affect	0.184	0.133	0.236	0.001
Designing competition $\rightarrow$ Exhaustion	-0.019	-0.072	0.034	0.556
Designing competition $\times$ Designing fun $\rightarrow$ Positive affect	0.109	0.059	0.159	0.001
Designing competition $\times$ Designing fun $\rightarrow$ Exhaustion	-0.086	-0.137	-0.035	0.005
Positive affect $\rightarrow$ Daily task performance	0.133	0.081	0.186	0.001
Exhaustion $\rightarrow$ Daily task performance	-0.083	-0.138	-0.029	0.012

Table 1
Means, Standard Deviations, and Correlations Between the Study Variables.

	M	SD	1.	2.	3.	4.	5.
1. Task performance	4.22	0.60		0.10	0.23	0.12	0.19
2. Activated positive affect	2.59	0.93	0.15*		-0.01	0.18	0.47*
3. Exhaustion	2.00	0.93	-0.11*	-0.23*		-0.01	0.24
4. PWD designing fun	3.00	0.75	0.13*	0.29*	-0.16*		0.50*
5. PWD designing competition	2.70	0.77	0.12*	0.30*	-0.08*	0.40*	

Note. Correlations above the diagonal are person-level correlations ($N = 57$ respondents), and correlations below the diagonal are day-level correlations ($n = 1,046$ measurement occasions). PWD = Playful Work Design.

* $p < 0.001$.

Table 3

Unstandardized Estimates and Confidence Intervals for Total and Indirect Effects of Designing Fun and Designing Competition Through Activated Positive Affect and Exhaustion in the Prediction of Daily Task Performance.

	Est.	95% C.I.		p
		Low	High	
Total effects				
Designing fun → Daily task performance	0.037	0.023	0.051	0.001
Designing competition → Daily task performance	0.023	0.011	0.034	0.001
Specific indirect effects				
Designing fun → Positive affect → Daily task performance	0.026	0.012	0.042	0.001
Designing fun → Exhaustion → Daily task performance	0.011	0.002	0.021	0.028
Designing competition → Positive affect → Daily task performance	0.021	0.009	0.036	0.001
Designing competition → Exhaustion → Daily task performance	0.001	-0.003	0.007	0.555

Note. C.I. = Confidence Interval.

Hypothesis 1 predicted that on days when individuals design fun, they experience (a) more activated positive affect and (b) less exhaustion. Indeed, designing fun was positively associated with activated positive affect ($\beta = 0.21, p < 0.001$) and negatively with exhaustion ($\beta = -0.14, p < 0.001$). Thus, on days when naval cadets designed fun more than usual, they felt more excited, inspired, and enthusiastic. These results support Hypothesis 1.

Hypothesis 2 stated that daily designing competition is (a) positively associated with positive affect and (b) negatively with exhaustion. Similarly to designing fun, designing competition was positively related to activated positive affect ($\beta = 0.18, p < 0.001$). However, the relationship between daily designing competition and exhaustion was not significant ($\beta = -0.02, p = 0.551$). These results provide support for Hypothesis 2a, whereas Hypothesis 2b was not supported. Note that inspection of the between-person coefficients indicated that individuals who more frequently designed competition reported higher levels of activated positive affect overall ($\beta = 0.53, p < 0.001$). The association with exhaustion was positive but statistically nonsignificant ($\beta = 0.28, p = 0.054$), providing no conclusive evidence for a between-person relationship.

In Hypothesis 3, we proposed that daily designing fun would be positively related to daily job performance through (a) more daily

activated positive affect and (b) less exhaustion. As predicted, designing fun had a daily indirect association with self-rated task performance through activated positive affect ($\beta = 0.022, p < 0.001$) and exhaustion ($\beta = 0.010, p = 0.044$; see Table 3). In other words, on days when individuals designed fun, they performed better because they experienced more activated positive affect and less exhaustion. Therefore, Hypothesis 3 is supported.

Hypothesis 4 states that daily designing competition relates positively to daily task performance through (a) daily activated positive affect and (b) daily exhaustion. While designing competition was positively associated with self-rated task performance through activated positive affect ($\beta = 0.019, p = 0.006$), there was no indirect association through exhaustion ($\beta = 0.001, p = 0.563$; see Table 3). Thus, while individuals performed better on days when they designed competition because they were more excited, inspired, and enthusiastic, this was not explained by changes in daily exhaustion. Thus, Hypothesis 4a is supported, whereas Hypothesis 4b is rejected.

Our fifth hypothesis proposed that the indirect association of designing fun with task performance through (a) activated positive affect and (b) exhaustion is amplified when designing competition is higher (vs. lower). Accordingly, we specified a moderated indirect effects model (see Table 3 and Fig. 2). As expected, the designing competition $\times$ designing fun interaction term was positively related to activated positive affect ($\beta = 0.11, p < 0.001$). The simple slopes are illustrated in Fig. 3. Simple slope analysis revealed that the daily association between designing fun and activated affect was stronger when individuals more often designed competition (+1SD slope; $b = 0.359, p < 0.001$) than when they did so less often (-1SD slope; $b = 0.151, p < 0.001$). Moreover, this pattern extended to task performance at higher (+1SD slope; $ab = 0.034, p = 0.003$) and lower levels of designing competition (-SD slope; $ab = 0.010, p = 0.050$). This means that on days when individuals designed fun and competition in concert, they performed especially well because they experienced more activated positive affect. Therefore, Hypothesis 5a is supported.

Likewise, the interaction effect between daily designing fun and daily designing competition was positively associated with daily exhaustion ($\beta = -0.09, p = 0.005$). The simple slopes are shown in Fig. 4. Simple slopes analyses indicated that designing fun reduced exhaustion when individuals more often designed competition (+1SD slope = $-0.252, p < 0.001$), whereas this association was not significant on days when they less frequently designed competition (-1SD slope = $-0.086, p = 0.090$). This also applied to the daily indirect association of designing

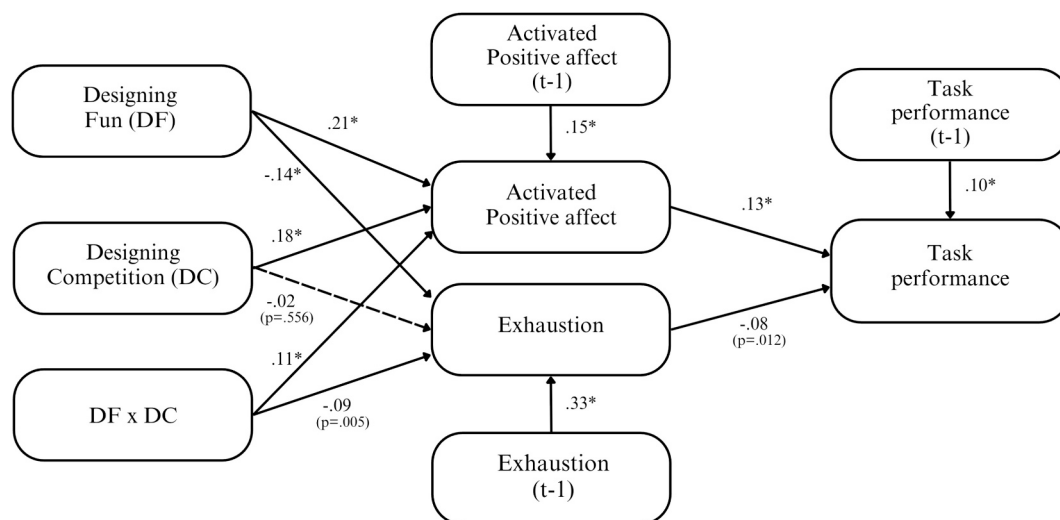


Fig. 2. Within-Level Parameter Estimates (β Coefficients) for the Final Multilevel Model. Note. * $p < 0.001$; The between-level was modelled simultaneously and revealed relationships between (a) designing competition and activated positive affect ($\beta = 0.53, p < 0.001$), (b) the interaction term and activated positive affect ($\beta = -0.30, p < 0.001$), and (c) exhaustion and task performance ($\beta = 0.28, p = 0.050$).

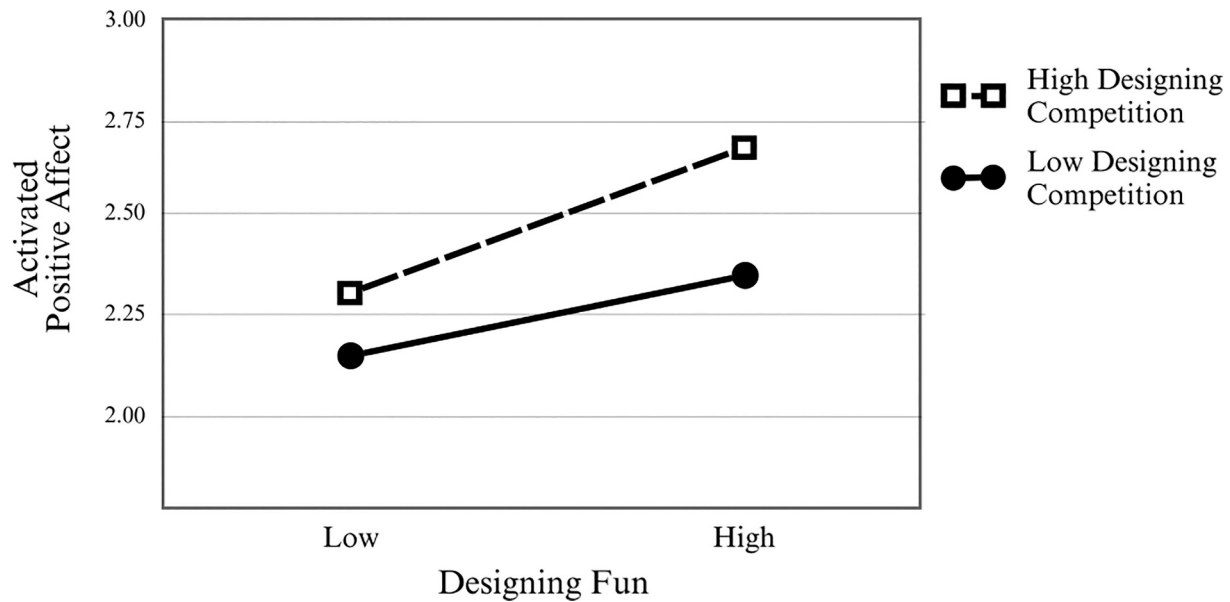


Fig. 3. Interaction Effect of Designing Fun and Designing Competition on Activated Positive Affect, Controlling for Previous-Day Activated Positive Affect (All Variables at the Day-Level).

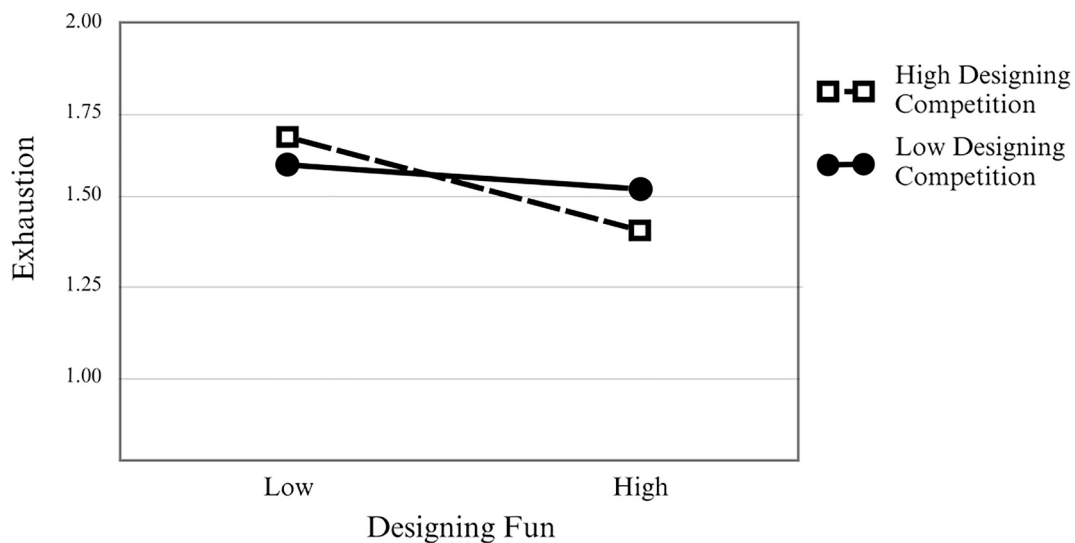


Fig. 4. Interaction Effect of Designing Fun and Designing Competition on Exhaustion, Controlling for Previous-Day Exhaustion (All Variables at the Day-Level).

fun with exhaustion, which was only present when designing competition was higher (+1SD slope; $ab = 0.021, p = 0.014$) rather than lower (−1SD slope; $ab = 0.004, p = 0.279$). In other words, when individuals combined designing fun with designing competition, they were less exhausted and therefore performed better, but this was not the case when they used designing fun in isolation. Therefore, Hypothesis 5b is supported as well.

4.4. Supplementary analyses

We conducted supplemental analyses to test the extent to which the associations of designing competition with the outcomes are qualified by designing fun. This reverses the predictor-moderator configuration tested above. On days when individuals designed competition in combination with designing fun (+1SD), they performed better because they experienced more activated positive affect ($ab = 0.030, p < 0.002$) and less exhaustion ($ab = 0.020, p < 0.014$). In contrast, there were no indirect associations with task performance through activated positive

affect ($ab = 0.006, p = 0.237$) and less exhaustion ($ab = -0.005, p = 0.255$) when individuals designed competition while they rarely designed fun (−1SD). Thus, the supplemental analyses further verify that the motivational potential of designing competition is enhanced by designing fun. Further, to rule out potential bias due to day-of-week effects, we estimated a model controlling the mediators and outcomes for day of the week at the within-person level. Results showed that day of the week was not significantly related to positive affect ($\beta = -0.05, p = 0.08$), exhaustion ($\beta = 0.03, p = 0.36$), or self-rated performance ($\beta = 0.06, p = 0.05$). Moreover, inclusion of the control variables did not materially alter the hypothesized parameter estimates relative to the uncontrolled model.

Finally, we examined possible carryover effects of PWD to the next days. In this lagged model, playful work design at day k predicted well-being (activated positive affect, exhaustion) at day $k + 1$, and indirectly task performance at day $k + 2$. The lagged model demonstrated a relatively poor fit to the data ($CFI = 0.81, TLI = 0.57, RMSEA = 0.065$), indicating that the hypothesized cross-day mediation structure is not

strongly supported. At the within-person level, designing fun at day k was positively related to next-day positive affect ($k + 1$) ($\beta = 0.08$, $p < 0.05$), consistent with our theorizing. However, the designing fun $\times$ designing competition interaction term showed an unexpected negative association with next-day positive affect ($\beta = -0.08$, $p < 0.05$). The remaining effects of the predictors on next-day mediators were not statistically significant. Moreover, positive affect at day $k + 1$ was unrelated to task performance at $k + 2$ ($\beta = -0.02$, $p = 0.66$), whereas exhaustion at $k + 1$ was negatively related to next-day performance ($\beta = -0.07$, $p < 0.05$). Thus, the lagged analyses provide support only for two theoretically expected links: designing fun predicting next-day positive affect, and exhaustion predicting performance.

Taken together, these findings suggest that the core processes linking PWD, affect, and performance may operate primarily at the within-day level rather than unfolding across days. The unexpected negative lagged interaction further suggests that the joint enactment of designing fun and designing competition may not accumulate linearly across days and should therefore not be interpreted as evidence of a sustained cross-day gain.

5. Discussion

In this article, we aimed to study strategies individuals can employ when they have little latitude regarding what they do, when they do it, and with whom. To address this, we integrated an information-processing perspective of playful work design into JD-R theory (Bakker, Demerouti et al., 2023; Salancik & Pfeffer, 1978; Weick et al., 2005). We argued that because playful work design increases resources and demands, on days when individuals design fun and design competition, they will perform better because they are more inspired, enthusiastic, and excited, in addition to being less exhausted. Moreover, based on the boosting hypothesis in JD-R theory, we expected the combined use of the dimensions of playful work design to synergize. The results of our 20-day daily diary study largely supported our hypotheses.

5.1. Theoretical contributions

We make several contributions to the emerging literature on play at work. First, theorizing regarding how and why play, and playful work design in particular, relates to outcomes remains limited (Van Vleet & Feeney, 2015). In the present study, we integrate an information-processing perspective (Beal et al., 2005; Salancik & Pfeffer, 1978; Weick et al., 2005) into the JD-R framework (Bakker et al., 2023) to refine our understanding of when and why playful work design emerges and how it generates outcomes. Specifically, we position playful work design within the motivational gain spiral of JD-R theory as a proactive, resource-generating strategy that is triggered under conditions of sufficient energetic and attentional capacity (see also Bakker, 2017). From an information-processing standpoint, employees continuously interpret situational cues to determine whether the environment affords exploration, experimentation, and playful reinterpretation. When job resources (e.g., autonomy, social support, task significance) exceed demands or when employees experience elevated work engagement, attentional bandwidth broadens and cognitive flexibility increases. This broadened processing mode enables playful reframing of tasks, the gamification of routine activities, and the reinterpretation of constraints as challenges. In this way, playful work design emerges as a downstream behavioral manifestation of the gain spiral (Bakker et al., 2023). Once enacted, playful work design further amplifies the spiral by generating additional resources. It increases intrinsic motivation, positive affect, learning opportunities, and social connectedness – each of which functions as a personal or job resource within JD-R theory. These newly created resources feed back into engagement, strengthening the upward motivational trajectory. Thus, playful work design operates not merely as an outcome of high engagement but as a catalytic mechanism that accelerates resource accumulation within the gain cycle.

At the same time, the information-processing lens helps explain why certain effects of playful work design may be transient (Scharp et al., 2022). Playful reinterpretations rely on novelty and attentional salience. As employees habituate to playful frames, their informational distinctiveness declines, reducing their capacity to broaden attention or generate additional resources. Consequently, unless renewed through variation or escalating challenge, the resource-generating effects of playful work design may attenuate over time. Taken together, embedding an information-processing perspective within the JD-R gain spiral clarifies (a) the antecedent conditions under which playful work design is likely to emerge, (b) its role as an endogenous resource-generation mechanism, and (c) the boundary conditions that constrain its durability. In doing so, the present study advances theorizing on play at work by reframing playful work design as a recursive, resource-accumulating process embedded in the JD-R gain spiral, rather than as a fixed job attribute or a passive reaction to situational cues.

Second, we challenge the idea that play necessarily undermines organizational efficiency and instead identify two distinct mechanisms that explain how playful work design translates into perceived task performance. Historical perspectives consider play to be frivolous and necessarily unproductive (Ford, 1922; Huizinga, 1938). Our research counters this view by revealing that on days when individuals initiated play during work activities, they were more productive because they were more enthusiastic, inspired, and excited. Importantly, our findings revealed that designing fun also promoted perceived daily task performance by reducing exhaustion, whereas designing competition did not. This is important because the existing literature primarily studied positively valenced constructs (Petelczyc et al., 2018). The dual pathway model developed in our research therefore contributes to a more nuanced understanding of how the dimensions of playful work design promote perceived task performance. While both dimensions energize employees on a given day, designing fun also appears to have a protective function, whereas designing competition does not appear to reduce exhaustion. Because activated positive affect was measured with only modest within-person reliability, the observed associations involving this mediator should be interpreted as conservative but measurement-constrained estimates.

Third, real-world applications of play often combine ludic and agonistic elements (Salen & Zimmerman, 2003; Schell, 2020), yet research on this integration remains limited. Most playful work design research has treated playful work design either as a unidimensional construct or as two separate dimensions (Chen & Choi, 2025; Tăbîrță & Vîrgă, 2025). While useful for isolating unique effects, this approach overlooks how designing fun and competition may operate jointly. Consistent with JD-R theory, our findings show that their combination explained unique variance in daily well-being and, indirectly, perceived daily task performance. On such days, employees made their work tasks both more resourceful and more challenging (Scharp et al., 2022), conditions that JD-R theory identifies as particularly favorable for well-being and performance (Bakker et al., 2023; Breevaart & Bakker, 2018). Specifically, designing competition amplified the favorable effect of designing fun on daily activated positive affect and exhaustion. This interaction advances understanding of the multiplicative effects of playful work design dimensions and clarifies how distinct work design strategies jointly influence employee experiences (Bakker & Junker, 2025; Bakker & Scharp, 2025).

At the same time, this interaction should be interpreted cautiously. Although our theorizing suggests that designing fun is primarily resource-enhancing and designing competition primarily challenge-demand-increasing, the present study does not identify the precise psychological mechanism through which competition amplifies the effects of fun. The amplification may reflect increased goal salience, heightened arousal, clearer performance feedback, stronger motivational intensity, or another process. We therefore interpret the interaction as an important empirical pattern rather than definitive evidence of a specific mechanism. Future research should examine these

mechanisms directly, for example by testing whether goal salience, arousal alignment, perceived feedback, or motivational intensity mediate the joint effects of designing fun and designing competition on daily well-being and performance.

In summary, our findings suggest that while designing fun is more reflective of an increasing resources strategy, designing competition could be conceptualized as an increasing demands strategy (Bakker, Demerouti, et al., 2023). The interaction patterns further support this reasoning. Namely, while designing fun increased activated positive affect and had a protective function in terms of decreasing exhaustion, designing competition primarily increased activated positive affect. Similar to the propositions of JD-R theory, which proposes that the motivational potential of job resources is amplified when challenge job demands are more (vs. less) prevalent (Breevaart & Bakker, 2018), the playful work design strategies were most effective in fostering activated positive affect and reducing exhaustion when enacted jointly. Thus, while information processing perspectives can help us understand how playful work design operates, JD-R theory elucidates its implications. This advances our understanding of playful work design by clarifying how its distinct dimensions jointly determine employee well-being and performance.

5.2. Practical implications

The present study provides several practical insights for managers, human resource (HR) practitioners, and organizational development consultants. First, our findings suggest that on days when people play during work activities, their job performance improves because their well-being improves (particularly through positive emotions). This implies that managers should avoid stereotyping play at work as inherently frivolous and provide employees with sufficient decision authority regarding how they perform their work. Indeed, Khan (2023) found that employees' attitude of curiosity especially translated into playful work design behaviors when leaders provided autonomy support (cf. Bakker et al., 2025). This underscores the important role supervisors play in facilitating the emergence of play during work.

Second, playful work design represents a bottom-up job redesign strategy with meaningful implications for employee functioning and well-being. Accordingly, managers and HR practitioners may benefit from actively fostering playful work design as a complement to more traditional top-down initiatives aimed at improving the work environment (cf. Bakker et al., 2023). Specifically, organizational practitioners may use training interventions to improve the ability of employees to design fun and design competition. In the first phase, the playful work design instrument could be used to identify "stars" who most often design fun and design competition when at work. Interviews with these individuals may help identify examples of playful work design fitted to the organizational context. In the second phase, these examples can be used to develop a tailored (online) intervention. We suggest that these interventions communicate the conceptualization of playful work design, offer concrete experiences in terms of experimentation, and stimulate reflection (Costantini et al., 2025; Kolb & Kolb, 2010).

Third, organizations may also directly cultivate playful work design. At its core, playful work design involves identifying and enacting opportunities for play during task execution. Organizations can support this process by creating environments that actively invite playful engagement with task operations. For example, organizations may gamify tasks through engaging narratives, real-time feedback on goal progress, and other interactive task features to encourage play during task execution. However, it is essential to recognize that unilaterally imposed play without personal freedom undermines the very essence of play (Scharp et al., 2023). When play initiatives by organizations are perceived as inauthentic, exploitative, and forced, they may trigger performative behavior, cynicism, and resistance (Fleming, 2005). Therefore, efforts to (directly) cultivate playful work design are more likely to succeed when they build on existing, supportive organizational

structures. At the same time, organizations should encourage designing competition with care. Because designing competition functions as a challenge-demand strategy, it is most likely to be beneficial when it remains voluntary, self-referenced, and focused on personal improvement rather than social comparison. Managers should therefore avoid fostering excessive interpersonal competition, which may undermine collaboration and unnecessarily increase pressure (Garcia et al., 2013).

5.3. Limitations and future directions

There are several limitations that merit consideration while interpreting the findings of our study. First, activated positive affect had modest within-person reliability. Because activated positive affect is a central mediator in our model, findings involving this construct should be interpreted cautiously. Methodological work indicates that unreliability in diary designs primarily attenuates effects rather than inflating them, suggesting that the reported within-person associations are conservative estimates of the underlying daily processes (Cranford et al., 2006; Yang et al., 2022). At the same time, the modest reliability constrains measurement precision at the daily level. Future research should therefore use alternative operationalizations of state affect, preferably with more items or repeated within-day assessments.

Second, our sampling strategy – focusing on naval cadets – reduced extraneous variance and thereby strengthened the internal validity of our findings, albeit at the potential expense of external validity (Johns, 2006). Naval cadets are not typical employees in many business organizations: their training context, discipline, team structure, and performance expectations may influence the meaning and use of fun and competition differently than in civilian workplaces. Accordingly, our findings should be generalized cautiously. Rather than speaking to all organizational contexts, the present study may be especially informative for low-discretion, high-structure, high-demand, and highly interdependent work settings. Similar contextual features can be found among military personnel, first responders, aviation crews, medical residents, elite athletes, and other high-reliability or high-stakes professions. In such settings, individuals may have limited control over what they do but still retain discretion in how they approach tasks. In contrast, in resourceful and optimally challenging jobs, the synergy between designing fun and designing competition might be less likely because their relevance decreases (cf. Scharp et al., 2021). Hence, replication in more heterogeneous civilian samples would further strengthen confidence in the broader applicability of the findings.

Third, we used self-report surveys to assess the study variables, which may introduce common method bias due to response tendencies, daily mood, or self-evaluation tendencies. Several features of our design reduce, but do not eliminate, this concern. First, the overlap between variables was not substantial. Second, person-mean-centering largely addresses sources of bias located at the between-person level, such as stable response tendencies (Conway & Lance, 2010; Podsakoff et al., 2003). Third, interaction effects are unlikely to be attributable to common method bias, which strengthens confidence in the detected moderation (Siemsen et al., 2010). Moreover, most constructs reflect personal experiences, for which self-reports are appropriate measures (Conway & Lance, 2010). Nevertheless, task performance was also self-rated. Accordingly, our performance-related conclusions should be interpreted as evidence for perceived daily task performance. Future research should examine whether the same pattern holds for supervisor-rated, peer-rated, or objective performance indicators, and may also explore a broader range of affective states.

Fourth, our research design prohibits us from making causal claims. To partly deal with the issue, we controlled for the preceding levels of the mediating and outcome variables, which implies we investigated changes in activated positive affect, exhaustion, and task performance as a function of playful work design. This design sacrifices the ability to make causal inferences for ecological validity. Therefore, our findings complement experimental research on play that evidences the causal

effects of play on motivation and performance (Costantini et al., 2025; Glynn, 1994; Sandelands, 1988). Future research should test causal claims using more fine-grained within-day designs that preserve ecological validity (Beal, 2015). At the same time, consistent with JD–R theory, reciprocal and dynamic associations between demands, resources, affect, and performance should be explicitly modeled rather than assumed to be unidirectional (Bakker, Demerouti, et al., 2023).

The lagged analyses further qualify our conclusions. Although designing fun predicted next-day activated positive affect, the cross-day model showed poor fit, most lagged paths were nonsignificant, and the interaction between designing fun and designing competition operated in an unexpected negative direction. These findings suggest that playful work design may be more episodic, immediate, and state-based than cumulative. Rather than producing stable carryover effects across days, playful work design may primarily alter how employees experience and enact ongoing tasks within the same workday. Future research should examine whether playful work design has short-lived effects that dissipate after task completion, or whether carryover occurs only under specific conditions, such as repeated enactment, task continuity, or recovery opportunities.

Finally, an important direction for future research is to examine whether the effectiveness of PWD varies by task type. Because we did not examine how participants allocated their time across specific daily activities, it remains unclear whether playful work design is more effective in some work contexts than others. This is an important avenue for future research, as tasks vary in autonomy, cognitive complexity, interdependence, and regulatory constraints—factors that likely influence employees' ability to proactively modify their work experiences. Diary research suggests that the effects of daily proactive behaviors such as job crafting are context-dependent and particularly pronounced when employees have sufficient discretion to regulate their tasks (Demerouti, 2026). Future studies could integrate daily diary designs with task-level assessments, such as the Day Reconstruction Method (Bakker & Oerlemans, 2019; Kahneman et al., 2004), to identify when and for whom PWD is most effective. Such work would enhance both theoretical precision and practical applicability. Moreover, to clarify the extent to which carry-over effects exist, future research may analyze such datasets using dynamic structural equation modeling techniques.

5.4. Conclusion

The current study suggests that employees can support their own daily well-being and performance through playful work design, even in occupations with little latitude. By making work activities more fun and more challenging, employees may create conditions that foster energy, reduce strain, and support perceived task performance. Moreover, the duality of playful work design shows that individuals can combine distinct forms of play to strengthen the motivational potential of their own behavior. By initiating play, employees can turn ordinary tasks into opportunities for joy, challenge, and growth.

CRedit authorship contribution statement

Arnold B. Bakker: Writing – original draft, Visualization, Investigation, Conceptualization. **Jørn Hetland:** Writing – original draft, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Yuri S. Scharp:** Writing – original draft, Conceptualization. **Olav Kjelleve Olsen:** Writing – review & editing, Resources, Investigation, Funding acquisition, Data curation. **Roar Espevik:** Writing – review & editing, Funding acquisition, Data curation.

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.

Data availability

Data will be made available on request.

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