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RESEARCH ARTICLE

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Does leisure crafting improve workplace creativity?

I-Shuo Chen[1] | **Jin Nam Choi**[2]

[1]School of Management, Anglia Ruskin University, Cambridge, UK

[2]Graduate School of Business, Seoul National University, Seoul, South Korea

Correspondence
Jin Nam Choi, Graduate School of Business, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, South Korea.
Email: jnchoi@snu.ac.kr

Abstract

Workplace creativity is essential for organizational survival and growth. With the prevailing focus on work conditions and employee motivation for creativity, it remains unclear whether and how employees can make creative contributions through proactive engagement in their private lives. This study aims to explore the development of workplace creativity from the non-work perspective of individual proactivity. Drawing upon conservation of resources theory, we investigate if leisure crafting improves workplace creativity by promoting playful work design. The hypotheses were tested using multi-wave field data collected from 365 employees. We revealed that leisure crafting contributes to playful work design, including fun and competition, especially when a smartphone is used for leisure purposes. Leisure crafting also has direct and indirect effects on creative performance through playful work design. The current analysis offers insights into how proactivity and resources gained from the non-work domain can improve workplace outcomes by enabling work-related proactive behavior.

KEYWORDS

creativity at work, leisure crafting, playful work design, smartphone use for leisure

INTRODUCTION

In the current business environment characterized by turbulent changes, creativity and the accompanying innovations in products, services, and processes have become key to competitive advantages and organization survival (Dun, Yuan, & Lunqu, 2020; Nöhammer & Stichlberger, 2019). *Creativity* refers to the generation of novel and useful ideas (Amabile, 1988). It may occur in any organization at any level for any occupation because employees can offer their ideas and unique thoughts to improve either organizational practices or their own tasks (Cirella, 2021; Magni & Manzoni, 2020; Shalley, Gilson, & Blum, 2000). A wide range of empirical studies has demonstrated the contributory role of creativity in improving performance and innovation for employees and organizations, highlighting its significance for business (e.g., Chen & Chen, 2013; El-Kassar et al., 2022; Valaei et al., 2022).

With the growing appreciation of creativity, the management literature has provided ample recommendations on how to improve employee creativity, primarily based on work and organizational factors (e.g., Cohen & Cromwell, 2021; Siswanti & Muafi, 2020; Slavich & Svejenova, 2016; Tang et al., 2020; Zutshi et al., 2021). However, the managerial interventions solely focusing on work and organizational factors to promote employee performance may be limiting in that the issue of work–life balance has gained ever-increasing significance (Chen, 2020). In addition, many employees today are requested to or choose to work from home, particularly after the global pandemic. Thus, an emerging stream of research has attempted to uncover whether and how a non-work environment and its associated factors may affect individuals' creativity at work. For example, creativity at work is significantly predicted by leisure time and hobbies (Davis et al., 2014), the pattern of non-work-related internet usage (Hojjati, 2016), and family culture (Zhou & Hoever, 2014). Much of this literature has presumed that individuals are passively exposed to and affected by non-work resources that flow to the work domain (cross-domain resource transfer, Clark, 2000). For example, receiving family support improves

individual creativity at work (Madjar, Oldham, & Pratt, 2002; Stollberger, Las Heras, & Rofcanin, 2021), and positive non-work experiences increase personal resources (i.e., emotional energy) that improve creativity (de Vries, Bakker, & Breevaart, 2021).

Departing from the extant assumption, we argue that individuals who play a proactive role in managing their personal life shape their work-related behavior, leading to creativity at work (Chen & Fellenz, 2020). Specifically, we focus on the function of leisure crafting to explore how individuals' proactive and purposeful behavior in their private life may carry over to their work domain. When individuals craft leisure activities, they aim for learning and development, set and pursue new personal goals, and make connections with new people (Petrou & Bakker, 2016). These behaviors facilitate individuals to generate resources that can be invested in performing creatively at work, as suggested by conservation of resources (COR) theory (Hobfoll, 1988). Leisure crafting has been studied widely for its contributions to individuals in their private life (Petrou, Bakker, & van den Heuvel, 2017; Tsaur, Yen, & Chen, 2021a,b). This study extends this literature by investigating the role of leisure crafting toward proactive work behavior and creativity.

Instead of assuming the direct spillover of resources gained from leisure crafting toward creativity at work, we propose that leisure crafting generates resources for shaping proactive work behavior that may lead to creativity. To this end, we isolate playful work design as an intervening mechanism between leisure crafting and creativity. Playful work design is a construct developed to describe how individuals integrate play with their work (Bakker et al., 2020). It affects their job attitudes and performance, including individual creativity (Lin et al., 2010; Pham & Bartels, 2021; Proyer, Tandler, & Brauer, 2019; Yu et al., 2007). However, the question of when employees proactively engage in playful work design is yet to be explored. We address this question by drawing on COR theory and argue that individuals benefit from additional resources gained through leisure crafting toward workplace creativity by integrating playful elements into their work. This integration forms a resource caravan, which presents the developmental creation of interconnected resources (Hobfoll et al., 2018).

To further elaborate on the question of when playful work design is promoted, we investigate the role of smartphone use for leisure as a moderating contingency. At present, people spend considerable time on personal devices, such as smartphones, for various reasons including leisure, entertainment, information search, learning, social connection, and work tasks (Allaby & Shannon, 2020; Fortes, Broilo, & Lisboa, 2021; Nimrod, 2016). Despite the prevalence of smartphone use, its implications in shaping work- and non-work-related behaviors remain controversial in the literature. Recent studies have shown that people use their smartphones heavily for leisure and perform online leisure crafting (Chen, 2020; Rubaca, Munir, & Munir, 2022). We propose that online leisure activities through smartphones may further strengthen the effect of offline leisure crafting on playful work design.

Drawing on COR theory (Hobfoll, 1988), we claim that the simultaneous engagement in online and offline leisure crafting can reinforce resource generation, thereby increasing playful work design and ultimately creativity. This theorizing elaborates on the resource caravan concept, which has been proposed in COR theory but has not been sufficiently developed yet (Halbesleben et al., 2014; Hobfoll et al., 2018). Empirical studies have demonstrated how resource caravans occur (Babu et al., 2024; Brennan et al., 2023; Hakanen et al., 2011; Halbesleben et al., 2014). Likewise, in this study, leisure crafting initiates a resource caravan by enabling individuals to generate resources that can be invested in playful work design, engendering additional resources proximal to the creative outcome. Thus, resources move in a pack rather than alone (Hobfoll et al., 2018). Yet, whether and how resource caravans can be amplified have been unexplored. By investigating the moderating effect of smartphone use for leisure, we extend the literature and show how a resource caravan can be accentuated.

Our study extends the management literature in the following ways. First, we enrich the literature on the relationship between personal life and workplace creativity by departing from the assumption of passivity and focusing on the proactive role of individuals in shaping their personal leisure activities. This approach complements existing studies that have mostly focused on the role of managerial interventions in improving employee creativity (e.g., El-Kassar et al., 2022; Khassawneh, Mohammad, & Ben-Abdallah, 2022; Zhang et al., 2022), thereby overlooking the role of individuals' proactivity in creativity.

Second, we investigate the mediating role of playful work design on the relationship between leisure crafting and creativity. Rather than assuming a direct flow of resources from non-work to work outcomes, we explore how individuals' non-work proactive behaviors affect their work-related proactive behaviors, thereby benefiting workplace creativity. Our investigation also extends prior work that has focused on the benefits of leisure crafting on individuals' private life (e.g., Petrou, Bakker, & van den Heuvel, 2017; Tsaur, Yen, & Chen, 2021a,b) and provides new insights into the cross-domain flow of resources to enhance proactivity and creativity at work.

Third, we extend the knowledge of how resource caravans work by examining the moderating role of smartphone use in the relationship between leisure crafting and playful work design. Additionally, investigating the hindering or promotive effect of smartphone use in the current research context may provide theoretical and practical insights that are highly relevant to the current living style of employees.

Fourth, we extend the literature on playful work design by identifying its antecedents. This approach

advances the emerging literature on playful work design, which has been preoccupied with its work outcomes (Bakker et al., 2020). By identifying a potential antecedent from the non-work domain in view of COR theory, the current model offers practical insights into effectively motivating employees' playful work design by enriching their personal life.

Finally, we contribute to the literature on playful work design from the perspective of the empirical context. The construct and associated phenomenon of playful work design has been mostly studied in Europe (Bakker et al., 2023; Scharp et al., 2023). Considering the differences between Europe and Asia in terms of work philosophy and culture, whether playful work design holds the same beneficial effects in the Asian context as previously observed in European workplaces merits further investigation. The current theoretical framework as summarized in Figure 1 is validated empirically through a multi-wave dataset collected from employees representing diverse industries in Taiwan.

THEORETICAL BACKGROUND

Conservation of resources theory

We draw on COR theory to connect the resources generated from the personal domain to further resource investment and acquisition in the work domain. As a theory of motivation, COR theory articulates the functions of the possession, loss, and gain of resources in helping individuals achieve specific goals and shaping their subsequent mental states and behaviors (Hobfoll, 1988). Although COR theory was developed in the context of stress, it became a broader, general theory applied to explaining various job demands, performance, and task situations beyond stress coping (Halbesleben et al., 2014; Hobfoll et al., 2018). Studies on creativity have often viewed the increasing demand for creative performance and new ideas as a job stressor or task challenge imposed on contemporary employees, which necessitates extra resources such as managerial support (Appu & Kumar Sia, 2015; Cirella, 2021; Slavich & Svejenova, 2016). Considering the adequacy of motivational and coping resources in explaining employee creativity, we draw on COR theory.

At the heart of COR theory, individuals are inherently motivated to not only conserve currently available resources but also acquire additional ones (Hobfoll, 1988). The theory further specifies that individuals need to invest available resources to gain more (Halbesleben et al., 2014; Mäkikangas et al., 2010). In this study, we propose that resources gained from one's personal domain through leisure crafting may be invested in designing work in a playful manner to generate additional work-related resources, thereby forming a resource caravan toward creativity at work. By identifying leisure crafting in the non-work context as a source of resources that enable workplace playfulness, we theorize the potential cross-domain flow of resources, a topic that has been largely neglected in the literature (see Abdel Hadi et al., 2021 and Chen & Wu, 2022 for exceptions). We also build on and expand the process of resource caravans by examining the operation of multiple resources (i.e., online and offline leisure crafting) in affecting the cross-domain resource caravan, thereby elaborating the phenomenon beyond the order that resources are obtained sequentially (Halbesleben et al., 2014).

The current framework builds upon and extends existing views on cross-domain resource flow. For instance, work-family enrichment (Greenhaus & Powell, 2006) and the work-home resource model (Ten Brummelhuis & Bakker, 2012) describe how resources generated in one role benefit individuals' performance in another role by affecting their mental state and personal resources. Recently, Chen (2024) extended the job demand-resource model to explain the impact of interactions between work and home influences on individuals' resources at work, such as work engagement. While these models help understand how resources affect individuals' mental state and performance across domains, they primarily focus on passive exposure to contextual resources and fail to specify individuals' proactive role in cross-domain resource flow leading to proactive contributions, such as workplace creativity. In this light, this study emphasizes the proactive role of individuals in the cross-domain spillover of resources, providing new insights into the spillover phenomenon.

Leisure crafting as a source of personal resources for creativity

Leisure crafting refers to individuals' proactive pursuit of leisure activities that aim toward personal learning and

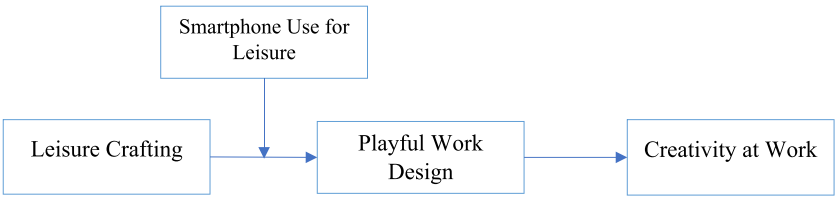

FIGURE 1 Theoretical framework.

development, goal setting, and human connections (Petrou & Bakker, 2016). When individuals craft their leisure activities, they are purposeful and commit to changing the situational conditions around leisure to accrue the intended benefits (Fritsch et al., 2005). Through leisure crafting, they intend to learn new things, expand their knowledge (Berg, Grant, & Johnson, 2010; Sonnentag & Fritz, 2014), and pursue challenges to test their potential (Deci & Ryan, 2000). They are therefore motivated to set and pursue new and higher goals (Petrou & Bakker, 2016). Moreover, these individuals attempt to not only connect with others but also widen their social network to enrich their interpersonal relationships (Brajša-Žganec, Merkaš, & Šverko, 2011; Snir & Harpaz, 2002). Accordingly, leisure crafters may proactively redefine the range of their leisure activities and broaden their relational boundaries (Demerouti et al., 2020).

Individuals who perform leisure crafting may acquire additional resources, such as new knowledge (via learning and developing, Tsaur et al., 2020), relational or social support (via connecting with others, Brajša-Žganec, Merkaš, & Šverko, 2011), and self-efficacy (via setting and pursuing new goals, Abdel Hadi et al., 2021). These resources are conducive to performing creatively (Karwowski & Kaufman, 2017; Yousaf & Ghayas, 2015). To produce creative ideas, individuals are required to detect a problem, search for needed information, and eventually generate and examine alternative ideas (Reiter-Palmon & Illies, 2004). In this sense, creativity requires individuals to invest considerable resources, such as cognitive resources, time, and effort (Chae & Choi, 2019). In line with COR theory (Hobfoll, 1988), we argue that leisure crafting may improve employee creativity by providing additional resources. Therefore, we posit the following hypothesis:

Hypothesis 1. Leisure crafting is positively related to creativity at work.

Leisure crafting and playful work design

Through leisure crafting, individuals acquire personal resources, such as intellectual (e.g., new knowledge, Chen, 2020), social (e.g., social support, Brajša-Žganec, Merkaš, & Šverko, 2011; Iwasaki, 2007), and psychological resources (e.g., self-efficacy, Schwarzer & Warner, 2013), in addition to having their passions and values fulfilled (Berg, Grant, & Johnson, 2010). Drawing on the resource caravan concept (Hobfoll et al., 2018) and the tendency of individuals to mobilize their available resources in a cross-domain manner (Chen & Fellenz, 2020), we expect that leisure crafting may motivate employees to invest their acquired resources into other activities to gain additional resources that are more proximal to desired outcomes. For example, a recent study has revealed that individuals who acquire resources from online leisure crafting of their personal life tend to improve their career self-management (e.g., Chen, 2020).

Play is an activity that aims at the goal of fun, challenge, or both (van Vleet & Feeney, 2015). Play is voluntary, process-oriented, and out of individuals' intrinsic motivation and enthusiasm (Petelczyc et al., 2018). The literature has categorized play into two types: ludic and agonistic. Ludic play is less rational and focuses on using one's humor and imagination, such as role-play and joking, whereas agonistic play is more rational and focuses on challenges and rules, such as games and competitions (Barnett, 2007; Martin & Ford, 2018). Accordingly, *playful work design* refers to proactive, cognitive, and behavioral processes that create and reshape work conditions that encompass the two elements of play by designing fun and competition at work (Bakker et al., 2023; Scharp et al., 2023).

When designing fun, individuals make their work experiences entertaining (Lieberman, 2014;Proyer, 2012; Robert & Wilbanks, 2012). This phenomenon occurs when individuals use their ludic mindset and related play strategies to experience fun and enjoyment while working (Robert & Wilbanks, 2012). When designing competition, individuals develop goals and rules to make their work challenging and filled with competition (Proyer, 2012; Robert & Wilbanks, 2012). This phenomenon occurs when individuals reshape task activities by using an agonistic mindset and related strategies, such as self-competition, to generate pleasure and fulfillment through expanding their work abilities and skills (Howe, 2008; Strauss & Parker, 2014).

Given the tendency of cross-domain resource mobilization (Chen & Fellenz, 2020), leisure crafting may enable individuals to experience positive affect and motivate them to initiate playful work design in task activities. For example, playing (video) games makes individuals become playful and identify fun or game-like aspects in their work life (Yee, 2006). Various leisure activities, such as having movie nights, going out for drinks, hiking, joining group fitness classes, and cycling, may allow individuals to extend their social network and bring fresh and optimistic perspectives to make their work experiences fun (Lee, Ryu, & Heo, 2022; Nielsen et al., 2021). Leisure crafting also allows individuals to acquire resources that help them handle challenging situations (e.g., new knowledge, social support, and self-efficacy, Walker, 2003). Leisure crafting can benefit designing competition because individuals may invest the additional resources in designing self-competitions and achieving challenging task goals (Hobfoll, 1988). For example, proactive leisure activities, such as attending a workshop or a book club, enjoying YouTube clips or podcasts, going to the library, and exploring a new hobby, may be helpful for individuals to develop skills

and knowledge, which in turn motivates them to take additional challenges and aim higher at work (Roggenbuck, Loomis, & Dagostino, 1990). Basing on these arguments, we propose the following relationship:

Hypothesis 2. Leisure crafting is positively related to playful work design.

Playful work design as a mediating mechanism

Playful work design may serve as a mechanism for translating resources from leisure crafting into creativity. Playfulness based on fun and self-competition at work is a crucial element that shapes individuals' motivation and performance (Djastuti, 2019; Fluegge-Woolf, 2014). Having fun with and gaining enjoyment from a task tends to strengthen motivational states toward task engagement (Tsaur, Hsu, & Lin, 2019). Similarly, having competitions at work makes work activities challenging, thereby improving work-related psychological states (e.g., flourishing at work; Kim & Beehr, 2020) and learning through task challenges (Robertson, Junek, & Lockstone-Binney, 2012). Individuals can acquire various psychological resources in favor of task performance through challenging and enjoyable work. Following COR theory (Hobfoll, 1988), we propose that playful work design may benefit the creativity of employees.

Employees' proactive reshaping of their work to make it fun and challenging may benefit creativity because this reshaping is aligned closely with intrinsic motivation, which is an essential driver of creativity (Amabile, 1988; Oldham & Cummings, 1996). Intrinsic motivation has enjoyment and challenge as its two primary elements, whereas extrinsic motivation has external concerns and compensation as core elements (Amabile et al., 1994). Thus, intrinsic motivation implies performing or engaging in an action because of its inherent satisfaction and pleasure (Ryan & Deci, 2007). Such a spontaneous action may encourage individuals to explore alternative solutions to address work problems, thereby benefiting creativity (Amabile, 1988).

In sum, we propose that leisure crafting may promote employee creativity indirectly through increased playful work design. Psychological, intellectual, and relational resources gained from leisure crafting enable employees to invest extra resources to redesign and make their work activities enjoyable (via designing fun) and challenging (via designing competition) (Bakker et al., 2020; Scharp et al., 2019). Having fun and competition may induce the experiences of intrinsic pleasure from work, which should increase creativity. Thus, we advance the following mediation hypothesis:

Hypothesis 3. Playful work design mediates the relationship between leisure crafting and creativity at work.

Moderation by smartphone use for leisure

Whether smartphone use benefits individuals remains controversial (Barkley & Lepp, 2016; West et al., 2012). Studies based on the theory of emotion regulation have revealed that given the ample functions and mobility of smartphones, individuals use them to reduce stress by interacting with others through texting and social network services or by playing games, listening to music, and watching video clips (Elhai et al., 2019; Hoffner & Lee, 2015). Smartphone use may be particularly beneficial for individuals' effective functioning when a fit occurs between the purpose of smartphone use and the nature of the activity they perform (Elhai et al., 2019). With this goal congruence, a smartphone may serve as a resource-boosting mechanism that makes ubiquitous the activity that individuals perform and allows them to gain additional resources anytime and anywhere. For instance, individuals receiving treatment for alcohol use disorder tend to acquire additional recovery support when they use a smartphone for care intervention purposes compared with when they do not use a smartphone for the same purpose (McKay et al., 2022). Thus, smartphone use for a particular purpose can accentuate the resource acquisition from offline activities pursuing the same purpose, thereby strengthening the resource caravan and enriching the associated resource-creation mechanism (Chen, 2020; Hakanen et al., 2011). In this regard, smartphone use is simply a tool that can be used in positive and negative ways depending on its congruence with offline activities.

Similarly, a smartphone may serve a supporting role for leisure crafting when it is used to plan for a specific purpose, acquire information, or connect with people for leisure activities (Allaby & Shannon, 2020; Karapanos, Teixeira, & Gouveia, 2016). Extending the original conceptualization of smartphone use (Kardefelt-Winther, 2015), we define *smartphone use for leisure* as an individual behavior of smartphone use specifically for leisure purposes. When used for specific leisure purposes, a smartphone may facilitate non-work-based resource acquisition, thereby increasing individuals' pool of available resources. Specifically, smartphone use for leisure may accentuate the acquisition of relational resources (by allowing constant social connections, David & Roberts, 2021), cognitive resources (through expedited gaining and sharing of information, Allaby & Shannon, 2020), personal resources (via crystalizing self-identity, Konijn et al., 2015), and physical/psychological resources (through improved recovery from stress, Kim, Park, & Niu, 2016).

Basing on these arguments, we propose that the co-presence or simultaneous engagement in leisure through online and offline activities may amplify the positive effect of leisure crafting on playful work design. This

condition strengthens the activation of the resource caravan, effectively promoting cross-domain resource transfer and investment (McKay et al., 2022). Thus, in line with COR theory (Hobfoll, 1988), individuals who craft leisure activities may gain additional psychological, intellectual, and relational resources that allow them to perform playful work design effectively, particularly when they use their smartphones for the same purpose. Accordingly, we hypothesize the following moderation effect:

Hypothesis 4. Smartphone use for leisure positively moderates the relationship between leisure crafting and playful work design.

We further extend this simple moderation logic to the indirect effect of leisure crafting on creativity through playful work design and propose a moderated mediation hypothesis. As explained earlier, individuals who craft their leisure activities may acquire additional resources that enable them to design their work for fun and competition, directly enhancing their creativity at work. This indirect relationship between offline leisure crafting and creativity may be accentuated by online leisure activities through a smartphone. This rationale leads to the following hypothesis:

Hypothesis 5. Smartphone use for leisure positively moderates the indirect relationship between leisure crafting and creativity at work mediated by playful work design.

METHODS

Participants and procedure

We collected two-wave field data from employees of Taiwanese organizations to test the proposed hypotheses. We worked with a survey company that facilitated contact with potential respondents and informed them of the study's purpose and procedures. The company also assisted in confirming the anonymity of the survey, the confidentiality of the collected data, and the permission of the respondents to participate. The respondents participated in the survey by using the app Line, and they received Line points when they fully completed the survey. Participation was voluntary, and they could stop at any time.

The Time 1 questionnaire was distributed to a group of 600 employees, from which we received 411 usable questionnaires (response rate = 68.5%). The Time 1 survey included measures of demographics, leisure crafting, smartphone use for leisure, and playful work design. The Time 2 questionnaire was distributed one month later to the 411 respondents who completed the Time 1 survey. At Time 2, we evaluated the respondents' creativity. The final analysis sample included 365 participants who provided usable data for both waves of data collection (final response rate = 60.8%).

The majority of the participants were female (67.1%). Their ages ranged between 21 and 30 years old (29%), 31 and 40 years old (42.7%), or 41 and 50 years old (23.8%). The participants' education levels were high school/vocational diploma (13.4%), bachelor's degree (71%), or graduate degree (13.4%). Nearly half of them worked in business management/service (42.5%), followed by manufacturing/operation (23%), engineering/technology (15.6%), and education (10.4%). The participants' work experiences were 1–3 years (15.6%), 3–5 years (16.7%), 5–10 years (14.8%), and more than 10 years (39.2%).

Measures

We translated all items from English to Mandarin. We also adopted a back-translation service of a professional translation company to ensure that the intended meaning of each item is maintained (Brislin, 1980).

Leisure crafting

We adopted a nine-item scale ($\alpha = 0.94$) developed by Petrou & Bakker (2016) to evaluate leisure crafting. Sample items are "I try to increase my skills through leisure activities" and "I look for new experiences through leisure activities to keep myself mentally stimulated." The items were rated using a five-point Likert scale ranging from 1 (*Not at all*) to 5 (*Very much*).

Playful work design

We adopted a 12-item scale ($\alpha = 0.93$) from Scharp et al. (2023) to assess playful work design. The scale contains two dimensions: designing fun and designing competition. Each dimension contains six items. Sample items for designing fun include "I approach my work in a playful way" and "I look for ways to make my work more fun." Sample items for designing competition are "I try to keep score in all kinds of work activities" and "I approach my job as a series of exciting challenges." The items were rated using a five-point Likert scale (1 = *Never*, 5 = *Very often*).

Smartphone use for leisure

We employed a four-item scale ($\alpha = 0.85$) developed by Derks and Bakker (2014) to measure the extent to which the participants use smartphones specifically for leisure-related purposes. The scale was initially designed to evaluate smartphone use in general. We modified the items to fit the purpose of this study. For example, we revised the original item "I use my smartphone intensively" as

TABLE 1 Means, standard deviations, and correlation results.

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	3.01	0.87	-											
2. Gender	1.33	0.47	0.08	-										
3. Education	3.95	0.63	−0.01	0.08	-									
4. Tenure	4.27	1.67	0.61***	0.09	0.08	-								
5. Occupation 1	0.02	0.13	0.00	−0.05	−0.13*	−0.11*	-							
6. Occupation 2	0.23	0.42	0.06	0.17***	−0.15**	0.03	−0.07	-						
7. Occupation 3	0.16	0.36	−0.04	0.25***	0.17***	0.02	−0.06	−0.24***	-					
8. Occupation 4	0.42	0.50	−0.06	−0.26***	−0.04	−0.07	−0.11*	−0.47***	−0.37***	-				
9. Occupation 5	0.05	0.22	−0.09	−0.11*	0.06	−0.05	−0.03	−0.13*	−0.10	−0.20***	-			
10. Leisure crafting	3.12	0.87	−0.13*	0.13*	−0.01	−0.13*	0.12*	−0.06	0.05	0.00	−0.01	-		
11. Smartphone use for leisure	3.34	0.88	−0.07	−0.02	0.06	−0.10	−0.03	−0.05	−0.07	0.13*	−0.03	0.35***	-	
12. Playful work design	3.23	0.76	−0.16**	0.05	0.02	−0.15**	−0.04	−0.09	0.06	0.05	0.00	0.58***	0.35***	-
13. Creativity	3.54	0.85	−0.08	0.00	0.02	−0.15**	−0.01	−0.06	0.04	0.04	−0.03	0.31***	0.21***	0.48***

Note: $N = 365$.

Age: 1 = 20 years old or under, 2 = 21–30 years old, 3 = 31–40 years old, 4 = 41–50 years old, 5 = 51–60 years old, 6 = 61 years old or order; Gender: 1 = Female, 2 = Male; Education: 1 = Elementary/Primary school and under, 2 = Junior high school, 3 = Senior high/vocational school, 4 = Bachelor's degree, 5 = Master's degree, 6 = Doctoral degree and above; Occupation: 1 = Agriculture, forestry/fishing, 2 = Manufacturing/operation, 3 = Engineering/technology, 4 = Business/service, 5 = Medical/Law; Tenure: 1 = Less than an year, 2 = 1–3 years, 3 = 3–5 years, 4 = 5–7 years, 5 = 7–9 years, 6 = More than 10 years.

*$p < 0.05$.

**$p < 0.01$.

***$p < 0.001$.

"During my non-work hours, I use my smartphone for leisure purposes intensively." The response format was a five-point Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*).

Creativity

For employee creativity at work measured in the Time 2 survey, we used a ten-item scale ($\alpha = 0.93$) developed by Zhou and George (2001). The scale has been used for managers to evaluate employees' creativity and for employees to evaluate their creativity (e.g., Ali Chughtai, 2016; Zampetakis, 2008). We asked the participants to rate their creativity. Sample items are "I come up with new and practical ideas to improve performance" and "I often have a fresh approach to problems." The items were rated on a five-point Likert scale (1 = *Strongly disagree*, 5 = *Strongly agree*).

We controlled for several demographic variables, including age, gender, education, occupation, and tenure, because these variables have been related to creativity (Klonoski, 2012; Liu, Ge, & Peng, 2016). We included theoretically meaningful control variables in our analysis and tested the robustness of the current hypotheses by removing alternative and confounding explanations (Bernerth & Aguinis, 2016). The results remained the same with or without these control variables.

RESULTS

The descriptive statistics and correlations among the study variables are presented in Table 1. We conducted a confirmatory factor analysis (CFA) to verify the empirical distinctiveness of the variable. The current measurement model with the hypothesized four factors exhibited acceptable fit to the data (χ^2 (1270.92), $df = 397$, $\chi^2/df = 3.20$, CFI = 0.90, SRMR = 0.05). We also tested alternative measurement models, including a three-factor model by collapsing leisure crafting and smartphone use for leisure as a single factor (χ^2 (1330.22), $df = 348$, $\chi^2/df = 3.82$, CFI = 0.86, SRMR = 0.10), a two-factor model by collapsing leisure crafting, smartphone use for leisure, and playful work design as a single factor (χ^2 (1926.67), $df = 349$, $\chi^2/df = 5.52$, CFI = 0.77, SRMR = 0.11), and a single factor model (χ^2 (2693.44), $df = 350$, $\chi^2/df = 7.70$, CFI = 0.66, SRMR = 0.11). The CFA and model comparison results supported the validity of the hypothesized measurement model over alternative models (χ^2 difference tests, all $p < 0.001$), thereby providing evidence of the empirical distinctiveness of the study variables.

We applied Model 7 specified by SPSS PROCESS Macro to test the conceptual framework depicted in Figure 1. The results are summarized in Tables 2 and 3.

TABLE 2 Regression equations predicting playful work design.

Predictors	Model 1	Model 2
Outcome: Playful work design		
Step 1		
Constant	1.88 (0.30)***	1.10 (10.46)
Age	−0.04 (0.05)	−0.04 (0.05)
Gender	−0.03 (0.08)	−0.03 (0.08)
Education	0.02 (0.05)	0.02 (0.06)
Tenure	−0.02 (0.03)	−0.02 (0.03)
Occupation 1	−0.67 (0.28)*	1.40 (1.23)
Occupation 2	−0.08 (0.12)	1.44 (0.96)
Occupation 3	0.03 (0.13)	1.20 (0.74)
Occupation 4	0.01 (0.11)	0.77 (0.50)
Occupation 5	−0.04 (0.17)	0.37 (0.31)
Leisure crafting	0.50 (0.04)***	0.49 (0.05)***
Step 2		
Smartphone use for leisure		0.16 (0.05)***
Leisure crafting* Smartphone use for leisure		0.13 (0.05)*
R^2	0.36	0.40

Note: Bootstrap sample size = 5,000.
Occupation: 1 = Agriculture, forestry/fishing, 2 = Manufacturing/operation, 3 = Engineering/technology, 4 = Business/service, 5 = Medical/Law.
Unstandardized regression coefficients are reported. Values in parentheses are standard errors.
*$p < 0.05$,
***$p < 0.001$.

Main effects and mediation

Hypothesis 1 posits that leisure crafting is a positive predictor of creativity. The results reported in Model 1 of Table 3 provide empirical support for the positive association between the two variables ($b = 0.30$, $p < 0.001$). Hypothesis 1 was supported by the data.

Hypothesis 2 proposes a positive relationship between leisure crafting and playful work design. Table 2 shows that leisure crafting is a significant positive predictor of playful work design ($b = 0.50$, $p < 0.001$). Thus, Hypothesis 2 was supported.

Hypothesis 3 states that playful work design mediates the positive relationship between leisure crafting and creativity. Table 4 reports that the indirect effect of leisure crafting on creativity through playful work design was positive and statistically significant (effect: 0.24, 95% CI = [0.15, 0.34]). Hence, Hypothesis 3 was supported by the data.

Moderation and moderated mediation

Hypothesis 4 states that smartphone use for leisure positively moderates the relationship between leisure crafting and playful work design. Table 2 reports that smartphone

TABLE 3 Regression equations predicting creativity.

Predictors	Model 1	Model 2
Outcome: Creativity		
Step 1		
Constant	2.80 (0.40)***	3.39 (0.14)*
Age	0.04 (0.06)	0.02 (0.07)
Gender	−0.07 (0.10)	−0.06 (0.10)
Education	0.03 (0.07)	0.02 (0.07)
Tenure	−0.07 (0.03)	−0.06 (0.03)
Occupation 1	−0.45 (0.36)	−1.22 (1.14)
Occupation 2	−0.10 (0.15)	−0.94 (0.91)
Occupation 3	0.02 (0.17)	−0.66 (0.70)
Occupation 4	−0.03 (0.14)	−0.50 (0.51)
Occupation 5	−0.17 (0.23)	−0.39 (0.32)
Leisure crafting	0.30 (0.05)***	0.05 (0.08)
Step 2		
Playful work design		0.49 (0.08)***
R^2	0.12	0.24

Note: Bootstrap sample size = 5,000.
Occupation: 1 = Agriculture, forestry/fishing, 2 = Manufacturing/operation, 3 = Engineering/technology, 4 = Business/service, 5 = Medical/Law.
Unstandardized regression coefficients are reported. Values in parentheses are standard errors.
*$p < 0.05$,
***$p < 0.001$.

use for leisure was positively related to playful work design. In addition, the interaction between leisure crafting and smartphone use for leisure was a significant positive predictor of playful work design ($b = 0.13$, $p < 0.05$). We conducted a simple slope analysis to probe this significant interaction further. The two regression lines plotted in Figure 2 indicate that the relationship between leisure crafting and playful work design was more positive for participants who reported high levels (1SD above the mean) of smartphone use for leisure ($b = 0.62$, $p < 0.001$) than those who reported low levels (1SD below the mean) ($b = 0.49$, $p < 0.001$). This pattern confirmed Hypothesis 4.

Hypothesis 5 further proposes that smartphone use for leisure moderates the indirect relationship between leisure crafting and creativity mediated by playful work design. We tested this moderated mediation hypothesis by comparing the conditional indirect effects at different levels of smartphone use for leisure. Table 4 reports that the indirect effect of leisure crafting on creativity via playful work design was greater when the participants reported high levels (1SD above the mean) of smartphone use for leisure (effect = 0.30, 95% CI = [0.18, 0.42]) than when they reported low levels (1SD below the mean) (effect = 0.18, 95% CI = [0.11, 0.28]). In addition, the index of moderated mediation was significant (Index = 0.06, 95% CI = [0.02, 0.13]), indicating that the indirect effects were significantly different at varying levels of smartphone use for leisure. These patterns supported Hypothesis 5.

Post-hoc analysis

The current analysis treated playful work design as a single construct with two dimensions: designing fun and designing competition. Although this approach is consistent with previous studies (Bakker et al., 2020), we checked the possibility that the two dimensions of playful work design operate somewhat differently in the current research framework. We conducted the same hypothesis-testing analyses by replacing playful work design with designing fun and designing competition. The results were consistent and almost identical for the two dimensions. Leisure crafting predicted designing fun and designing competition significantly ($b = 0.52$, $p < 0.001$ and $b = 0.46$, $p < 0.001$, respectively). Moreover, designing fun and designing competition mediated the relationship between leisure crafting and creativity ($b = 0.12$, 95% CI = [0.03, 0.23] and $b = 0.12$, 95% CI = [0.04, 0.22], respectively).

The interaction between leisure crafting and smartphone use for leisure was a significant predictor of designing fun and designing competition ($b = 0.14$, $p < 0.05$ and $b = 0.12$, $p < 0.05$, respectively). The separate analyses using the two dimensions of playful work design also supported the moderated mediation hypothesis. Smartphone use for leisure moderated the indirect effect of leisure crafting on creativity through designing fun or designing competition (moderated mediation index: Index = 0.03, 95% CI = [0.01, 0.08] and Index = 0.03, 95% CI = [0.01, 0.08], respectively).

DISCUSSION

This study investigated the role of proactive behavior in the personal life domain toward similarly proactive behavior in the work domain, ultimately explaining the workplace creativity of employees. In our conceptual framework drawn on COR theory and the resource caravan concept (Hobfoll, 1988; Hobfoll et al., 2018), we proposed that leisure crafting promotes playful work design for fun and competition, thereby increasing creativity. An empirical analysis of multi-wave data confirmed the hypothesized indirect relationship between leisure crafting and creativity at work mediated by playful work design. Our analysis also revealed that smartphone use for leisure strengthened the indirect relationship. In the next sections, we discuss the theoretical and practical implications of this study and address its limitations and directions for future research.

TABLE 4 Results of the moderated mediation model: indirect and conditional indirect effects of leisure crafting on creativity through playful work design with smartphone use for leisure as a moderator.

						Bootstrapping bias-corrected 95% CI	
Independent variable	Mediator	Dependent variable	Moderator	Moderator level	Conditional indirect effect	Lower limit	Upper limit
Leisure crafting	Playful work design	Creativity at work	Smartphone use for Leisure	Low	0.18	0.11	0.28
				Medium	0.24	0.15	0.34
				High	0.30	0.18	0.43
Index of moderated mediation					0.06	0.02	0.13

Note: N = 365. Bootstrap sample size = 5,000.
CI = confidence interval.

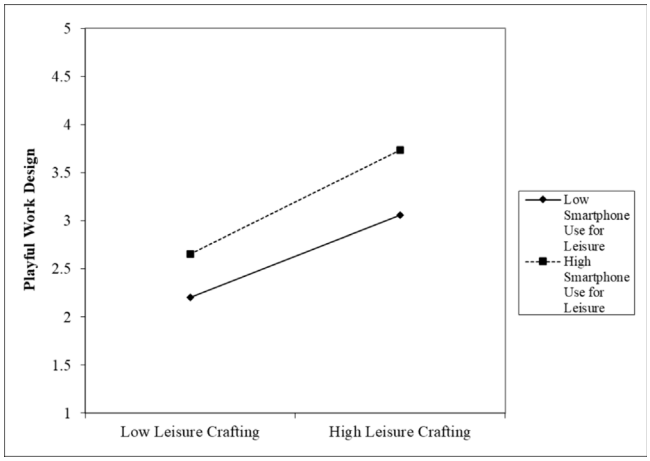

FIGURE 2 Moderating effect of smartphone use for leisure on the relationship between leisure crafting and playful work design.

Theoretical implications

This research provides several theoretical implications. First, it advances the creativity literature by investigating the role of leisure crafting as a new predictor from the non-work domain. Complementing the previous assumption that employees tend to be passively exposed to and affected by their personal and family life (Ererdi et al., 2024; Madjar, Oldham, & Pratt, 2002; Stollberger, Las Heras, & Rofcanin, 2021), we focus on proactivity in non-work domains, thereby providing new insights into the workplace creativity. In addition, unlike existing studies that have investigated the cross-domain flow of specific resources to improve creativity at work (e.g., Chae & Choi, 2019; de Vries, Bakker, & Breevaart, 2021), we investigated how such a resource flow may shape employees' proactive behavior at work (i.e., playful work design) that has direct implications for creativity. Our analysis demonstrates that individuals may not only be affected passively by resource flow but also craft resources proactively in a cross-domain manner to perform creatively at work. In this sense, our finding further advances COR theory (Hobfoll, 1988; Hobfoll et al., 2018) by clarifying the role of individuals' proactivity in resource-crafting behavior at multiple or crossing different domains of leisure and work, forming a resource caravan.

Second, this study enriches the understanding of leisure crafting by focusing on its role in shaping work-related outcomes. Studies on leisure crafting have emerged recently and have focused mostly on its functions concerning individual outcomes in non-work domains (e.g., improved life significance, psychological wellbeing, Abdel Hadi et al., 2021; Petrou, Bakker, & van den Heuvel, 2017). We advance this literature by showing that leisure crafting may contribute to work-related behavior and outcomes of individuals by motivating them to design playful work and perform creatively. Our analysis shows that playful work design fully mediates the relationship between leisure crafting and creativity. The fact that leisure crafting is an individual's proactivity in private life raises the question of whether a more proximal factor channels the resources gained from leisure crafting to creativity at work (Hamrick, 2022). This question is yet to be answered. The current findings signify that playful work design may be the factor representing work-based proactivity into which individuals can invest resources gained from the leisure activities, thereby bridging the non-work resources and work outcomes. Further research may expand the current findings to explore additional functions and alternative intervening processes of leisure crafting toward outcomes in the workplace.

Third, in line with COR theory (Hobfoll, 1988), our analysis supports the positive interaction between leisure crafting and smartphone use for leisure in predicting work-related outcomes. Consistent with prior findings (McKay et al., 2022), under the condition of a congruent purpose, smartphone use can transform individuals' offline activities into a ubiquitous endeavor and help them obtain additional benefits from such activities. Thus, a consistent pursuit of leisure activities online and offline enables individuals to engage in greater levels of playful work design. This pattern clarifies a condition that smartphone use can contribute to individuals' effective

functioning across their life and work domains. Our analysis results elaborate on the concept of resource caravan (Hobfoll et al., 2018). Complementing prior studies exploring the sequence and occurrence of resource caravans (Babu et al., 2024; Brennan et al., 2023; Hakanen et al., 2011), our work investigates a condition that intensifies the resource caravan process. Our findings reveal that smartphone use under a fitting-purpose condition may accentuate the resource caravan by assisting leisure crafters to acquire extra resources without the restriction of time and location. In other words, we add new insights into COR theory by explaining why some people can accumulate resources more than others during the same resource caravan process.

Fourth, this study extends the emerging literature on playful work design that has demonstrated its value in explaining various work attitudes and job performance (e.g., Bakker et al., 2023; Bakker & van Wingerden, 2021; Scharp, Bakker, & Breevaart, 2022). We build on the benefit of playfulness toward creativity (e.g., Lin et al., 2010; Pham & Bartels, 2021; Yu et al., 2007) and demonstrate a positive effect of playful work design on creativity. Despite the acknowledgment of its importance, how playful work design can be motivated beyond individual traits that are related directly to playfulness (i.e., ludic and agonistic traits, Scharp et al., 2023) remains unclear. Considering the significance of playful work design, understanding its predictors is necessary to advance research and practice. In this respect, playful work design may not easily be motivated by conventional, managerial interventions based on work-centered perspectives that often hinder fun and inner challenges for individuals (Csikszentmihalyi, 1975). Addressing this challenge, our analysis reveals a cross-domain process in which playful work design is motivated by the interaction between leisure crafting and smartphone use for leisure. This cross-domain perspective linking leisure to playfulness at work complements the play literature and suggests a novel direction to consider the roles of employees' private life toward playful work design.

Finally, our study contributes to the literature from the study context perspective by examining the role of playful work design in an Asian work context (i.e., Taiwan). Most studies on playful work design have been conducted in Europe (e.g., Bakker et al., 2023; Scharp et al., 2023), so this empirical extension is crucial. What works in a European work context greatly differs from that in an Asian work context, and vice versa. In this light, our findings on the positive role of playful work design in the Taiwanese work context validate the generalizability of the construct. Moreover, our analysis invites further investigations on its joint effect combined with other Asian-specific work elements (e.g., guanxi, Hu, Schaufeli, & Taris, 2016) on employees' creativity to further extend the understanding of playful work design in varying cultural contexts.

Practical implications

Our findings hold practical significance for both managers and organizations. First, acknowledging the favorable effect of leisure crafting on proactive work behavior and creativity in the workplace, organizations may choose to endorse and facilitate employees' engagement in crafting their leisure and personal lives. Specifically, managers can inspire employees to proactively establish and pursue non-work-related goals (e.g., participating in sports and competitions), expand their social connections (e.g., meeting new, like-minded individuals), and foster personal growth (e.g., developing new interests and skills) during their off-work hours. To promote such a proactive use of leisure time, organizations can provide support, including financial assistance like employee development funding and other resources such as flexible work schedules, to assist employees in proactively shaping their leisure or non-work activities.

Second, managers can foster and direct employees to create enjoyable and self-competitive elements within the workplace, aiming to enhance creativity. Encouraging this proactive approach to designing a playful work environment may inspire employees to explore alternative, fun, and challenging approaches to completing their tasks. By engaging in such efforts, employees can cultivate playful methods of introducing enjoyment and challenge into their work, aligning with the intrinsic motivation principles of enjoyment and challenge as outlined by Amabile et al. (1994). This performance-enhancing approach conforms to contemporary motivational recommendations, advocating for the incorporation of gamification in the workplace, which is particularly appealing to younger individuals (Yen, Fu, & Chiou, 2022). When guiding employees in crafting a playful work design, managers may need to promote specific forms of leisure crafting (e.g., learning, social networking, goal setting, and challenges) because the nature of these non-work activities can have distinct implications for fostering fun, self-competition, or other proactive work behaviors. Furthermore, managers can encourage employees to leverage the resources acquired through crafted leisure activities, such as harmless jokes, pranks, and new ideas, to infuse a playful atmosphere into their work, potentially contributing further to enhanced creativity.

Third, employees can garner extra resources from the leisure activities they engage in, especially when utilizing smartphones for leisure purposes. Consequently, the alignment or compatibility between online and offline leisure pursuits plays a crucial role in empowering individuals to amass the necessary resources for actively shaping their work environment with elements of enjoyment and self-competition (Derks et al., 2021). Managers may endorse the effective use of smartphones by employees while crafting their leisure activities. Specifically, managers may strive not to disturb employees during non-

work hours, allowing them to temporarily refrain from using smartphones for work-related purposes while engrossed in their leisure pursuits. This approach transforms the smartphone into a tool that seamlessly integrates with leisure activity, facilitating the efficient acquisition of additional resources. Consequently, this online and offline integration enhances the effect of leisure crafting on shaping a playful work environment, ultimately contributing to heightened creativity in the workplace.

Study limitations and future research directions

Our findings may be interpreted by considering the following limitations. First, the participants in our sample were all from a single national context, which may limit the generalizability of the findings to other countries. Existing studies have not shown evidence that employees in Taiwan are more likely to either under- or over-report the current variables than those in other countries. Nonetheless, the generalizability of our research may still be improved by replicating the current analysis results using data collected from various national contexts.

Second, our results might have been affected by common method variance because all focal measures were reported by employees (Podsakoff et al., 2003). The concern regarding the same source bias was mitigated in several ways. The one-month interval between the Time 1 and Time 2 surveys adopted in our data collection might partially reduce such a concern. The empirical validation of the measurement model revealed that the model fit indices were acceptable only for the hypothesized model but not for the alternative measurement models. Additionally, common method bias may not have a significant influence on the interaction results because correlated errors cannot lead to a spurious interaction but hinder the true interaction (Du et al., 2018; Schmitt, 1994). Nevertheless, future studies should include multi-source or objective measures to further validate and expand the current theoretical propositions.

Third, our analysis focused on psychological and behavioral processes occurring in the personal and work domains of individuals and their creativity at work. We neglected the role of organizational contextual factors. Future research may complement and extend the boundaries of the current model by considering the contextual influences, such as the role of a leader. For example, leaders exhibiting fun leadership may provide employees with resources that are particularly relevant to playfulness at work. Fun leadership refers to leaders' skills and behaviors to encourage employees to feel pride, fun, and joyfulness regarding their tasks (Lee & Chae, 2008). In line with COR theory (Hobfoll, 1988), with high (versus low) fun leadership, employees may perceive ample resources to make their work playful. In this light, future research may consider the functions of fun leadership and other theoretically plausible contextual factors in shaping playful work design and subsequent creativity.

Finally, considering that playful work design comprises two underlying dimensions, we conducted the same hypothesis-testing analysis for the two dimensions separately. This post-hoc analysis verified the identical effect patterns for designing fun and designing competition in the current research framework. Although not observed in the current analysis, the two dimensions may resort to different mechanisms such that designing fun requires imagination and humor (Lieberman, 2014; Proyer, 2012; Robert & Wilbanks, 2012). By contrast, designing self-competition requires cognitive abilities to reshape work activities through challenging targets for expanding work capabilities and skills (Hamilton, Haier, & Buchsbaum, 1984; Howe, 2008). Thus, the two dimensions can be motivated by somewhat different factors. However, in the present context, leisure crafting enables individuals to experience positive affect through the leisure activities they crafted, generating imagination while obtaining resources that help them deal with challenging situations (e.g., new knowledge, social support, and self-efficacy, Leon et al., 1991; Walker, 2003). This property of leisure crafting may explain why the analysis results for designing fun and designing competition were the same. Nonetheless, further studies should identify disparate motivators of the two dimensions of playful work design other than leisure crafting that may exert distinct predictive effects.

CONCLUSION

This study shows that individuals' proactive engagement in the personal non-work domain can improve their performance in the work domain by encouraging similarly proactive behavior in the workplace. It also highlights the benefits of the alignment in online and offline activities for leisure in generating additional resources toward proactive work behavior. Given the increasing emphasis on work–life balance and the adoption of hybrid forms of work, organizations need to identify ways to embrace the personal life of employees to improve their proactive task engagement and performance. In this respect, further research on leisure crafting and playful work design should elucidate new managerial practices to transform employee proactivity in the personal, non-work domain into a capital that is essential for the long-term development and performance of organizations.

CONFLICT OF INTEREST STATEMENT

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 STATEMENT

Data available on reasonable request from the authors.

ORCID

I-Shuo Chen https://orcid.org/0000-0003-4451-1884
Jin Nam Choi https://orcid.org/0000-0001-7890-3195

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AUTHOR BIOGRAPHIES

I-Shuo Chen is Senior Lecturer of Organizational Behavior at Anglia Ruskin University, United Kingdom. He earned his PhD in Business Studies with Organizational Behavior as his specialized area from Trinity College Dublin. His research interests include leisure crafting, job boredom, work engagement, work-family balance, and creativity.

Jin Nam Choi is Professor of Management at Seoul National University, South Korea. He earned his PhD in Organizational Psychology from the University of Michigan. His research interests include innovation implementation, organizational creativity, and multilevel processes of human behavior in organizations.

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