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Playful work design, flow, and employee creativity

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Abstract: This study explores the impact of playful work design on employee creativity through flow, as well as the moderating role of playful climate in this relationship. We collected data from 272 employees across various industries in China (47.2% from the service industry; 61.8% female; 63.6% aged 26–40 years). Participants completed measures of playful work design, flow, playful climate, and creativity. Through hierarchical regression and bootstrapping analyses, the results indicate that: (a) playful work design is positively associated with creativity; (b) flow mediates this relationship; and (c) playful climate strengthens the link between playful work design and flow, thereby enhancing employee creativity. These findings support work flow theory by demonstrating that playful work design satisfies employees' basic psychological needs, stimulates intrinsic motivation, and ultimately induces flow to enhance creativity. For practical implications, managers should prioritize employees' work experience, monitor their flow states, and foster a playful climate.

Keywords: playful work design; flow; employee creativity; playful climate

Introduction

Employee creativity is critical to organizational competitiveness. However, employee creativity cannot be externally imposed on employees; they must discover and explore it based on their inclinations and within a supportive work climate (Amabile, 1983). Work climate characteristics—including leadership styles, collaborative behaviors, physical workspace design, and technological infrastructure—significantly influence creative engagement (Anderson et al., 2014; Chen et al., 2016; Lee et al., 2020). Notably, creative potential often emerges serendipitously when employees engage in playful experimentation to optimize work outcomes. This aligns with the concept of playful work design, defined as the process in which employees proactively create conditions that promote enjoyment and challenge without altering the inherent design of the job itself (Bakker et al., 2020b; Bakker et al., 2023).

Despite the documented impact on productivity and competitive advantage (Caracuzzo et al., 2024; Fluegge–Woolf, 2014), the relationship between playful work design and employee creativity remains insufficiently explored. This study aims to address this gap by investigating the impact of playful work design on employee creativity, the mediating role of flow, and the moderating effect of playful climate in the playful work design-creativity relationship.

Playful work design and employee creativity

The core concept of playful work design asserts that "play" is not merely an activity but a mode of executing tasks (Mainemelis & Ronson, 2006). As an individual work design strategy, playful work design is embedded in work—specifically, play as engagement with work (Hoang & Le, 2024; Mainemelis & Ronson, 2006). Through playful work design, employees may experience enhanced overall work engagement (Gerdenitsch et al., 2020; Lazazzara et al., 2020). Existing research suggests that when employees approach their work in an entertaining manner, they are more likely to exhibit higher engagement, generate greater creativity, and achieve better job performance (Bakker et al., 2020a; Caracuzzo et al., 2024; Dishon-Berkovits et al., 2024; Scharp et al., 2019). Hunter et al., (2010) argues that workplace playfulness can alleviate job stress and fatigue while fostering social interaction among organizational members. Moreover, employees who embrace playfulness often produce more innovative ideas, break free from routine, and even enhance divergent and creative thinking through playful activities (Liu et al., 2023, 2024).

Work flow mediation

Flow, in the context of work experience, is characterized by intense concentration, enjoyment of work, and intrinsic motivation (Csikszentmihalyi, 2014). Research on the application of flow in the workplace indicates that employees can not only experience flow in specific gamified tasks but also sustain it across tasks when appropriate playful elements are incorporated (Nakamura & Csikszentmihalyi, 2002; Silic et al., 2020).

Flow is hypothesized to mediate the relationship between playful work design and employee creativity by fostering divergent and creative thinking, thereby enhancing innovative behaviors (Dan, 2021; Li & Tao, 2023). When interest and challenge are balanced, individuals experience heightened work efficiency, enabling them to quickly develop solutions to problems (Silic et al., 2020). Engaging in gamified work tasks facilitates flow experiences, allowing employees to maintain psychological engagement and full immersion in their tasks (Rich, et al., 2010). Moreover, playful work design enhances enjoyment at work by incorporating playful or competitive task
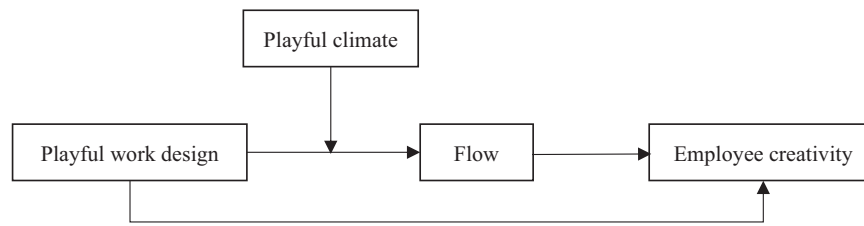
Figure 1. Theoretical model

performance—such as through humor, fun, and imagination (Scharp et al., 2022; Tews et al., 2014).

Playful climate moderation

Playful work climate is by playful interactions among employees (Pors & Andersen, 2015; Chang et al., 2013), contributes to employee creativity. A playful climate frees the mind for creativity (Zhou et al., 2022). When employees experience a playful work environment, they are more likely to autonomously develop their creative outputs (Deci & Vansteenkiste, 2004; Ryan & Deci, 2000) through a sense of autonomy, competence, and relatedness (Celestine & Yeo, 2021). In such a climate, employees enjoy flexible decision-making, and work leaders who are open and receptive to employee perspectives and emotions. This environment unleashes individual potential for novel problem-solving approaches rather than conventional thinking (Silic et al., 2020; Yao et al., 2024; Yu et al., 2003; Zhou et al., 2022).

Goal of the Study

This study aimed to explore the relationship between playful work design and employee creativity through flow, as well as the moderating role of playful climate in this relationship. Figure 1 presents the hypothesized model for this study. Based on our conceptual model, we tested the following hypotheses.

Hypothesis 1 (H1): Playful work design is positively associated with employee creativity.

Hypothesis 2 (H2): Playful work design is positively associated with flow.

Hypothesis 3 (H3): Flow mediates the positive relationship between playful work design and employee creativity.

Hypothesis 4 (H4): Playful climate moderates the relationship between playful work design and for higher work flow.

Hypothesis 5 (H5): Playful climate moderates the mediating role of flow between playful work design and employee creativity for higher employee creativity.

Method

Participants and setting

The total sample (n = 272) comprised of 104 (38.2%) males and 168 (61.8%) females. In terms of industry, mostly (47.2%) from service industry. In terms of age, the majority (63.6%) were aged between 26 and 40 years old. In terms of education, the majority (94.5%) have a bachelor's degree or above. In terms of work experience, the majority (63.6%) were with more than three years on their jobs.

Measures

We adopted established scales to measure the constructs under study. To ensure accuracy, the original English versions were translated into Chinese through the forward-and-backward translation process. All measures used a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Playful work design. Playful work design was measured using a 24-item scale developed by Scharp et al. (2023), comprising two dimensions: fun design (12 items; e.g., 'I handle my work in a fun way') and competitive design (12 items; e.g., 'I often set time records in work tasks'). In the present study, the scale demonstrated good reliability, with a Cronbach's α of 0.75.

Flow. Flow was measured using a 9-item scale developed by Martin and Jackson (2008). Sample items include: "I don't think about other things while working", and "My attention is completely focused on the task at hand". In the present study, the scale demonstrated good reliability, with a Cronbach's α of 0.82.

Employee creativity. Employee creativity was measured using the 7-item scale developed by Farmer et al. (2003). Sample items include: "At work, I often come up with creative ideas or suggestions", and "I promote my new viewpoints and ideas to other colleagues". The Cronbach's α for the employee creativity scale in this study was 0.81.

Playful climate. Playful climate was measured with a 20-item scale developed by Yu et al. (2003). The scale consists of four subscales: colleague affection (5 items, e.g., 'Members in the organization are close, friendly, and communicate pleasantly with each other'), supervisor support (5 items, e.g., 'My supervisor can set aside status differences and connect with everyone'), joy at work (5 items, e.g., 'Playing with colleagues gives me a sense of teamwork'), and environmental construction (5 items, e.g., 'The workplace environment makes it easy for everyone to get close and familiar with each other'). The Cronbach's α for the playful climate scale in this study was 0.875.

Control Variables. Drawing on previous research on employee creativity, individuals' personal characteristics can influence creativity. Additionally, playfulness traits are often conceptualized as expressions of certain personality characteristics (Barnett, 2007; Celestine & Yeo, 2021; Petelczyc et al., 2018; Tett & Burnett, 2003). Therefore, this study considers individual characteristics such as gender, age, education level, working seniority as control variables.

Table 1. Result of CFA for the measures of variables

		X²	df	X²/df	RMSEA	CFI	TLI	SRMR
Four-factor model	PWD, Flow, EC, PC	373.711	180	2.076	0.065	0.923	0.910	0.025
Three-factor model 1	PWD, Flow + PC, EC	464.054	186	2.495	0.076	0.890	0.876	0.026
Three-factor model 2	PWD, Flow, EC + PC	490.076	186	2.635	0.080	0.879	0.864	0.026
Three-factor model 3	PWD, Flow + EC, PC	458.897	186	2.467	0.076	0.892	0.878	0.026
Tow-factor model	PWD, Flow + EC + PC	491.409	188	2.614	0.079	0.880	0.866	0.026
One-factor model	PWD + Flow + EC + PC	506.838	189	2.682	0.081	0.874	0.860	0.026

Note. N = 272, TLI = Tucker-Lewis index, CFI = Comparative fit index, SRMR=Standardized Root Mean Square Residual, PWD = Playful work design, EC = Employee creativity, PC = Playful climate.

Table 2. Descriptive statistics of and correlations analysis

Variables	1	2	3	4	5	6	7	8	9
1. PWD	1								
2. Flow	0.539**	1							
3. EC	0.623**	0.540**	1						
4. PC	0.544**	0.508**	0.547**	1					
5. Gender	−0.088	−0.093	−0.135*	−0.060	1				
6. Age	0.271**	0.290**	0.271**	0.263**	0.000	1			
7. Edu	0.054	0.004	0.044	0.113	−0.18	0.085	1		
8. WS	0.309**	0.336**	0.336**	0.283**	−0.120*	0.765**	0.106	1	
9. Ind	−0.102	−0.060	−0.011	−0.114	−0.083	0.029	-0.137*	0.065	1
Mean	4.236	3.870	4.020	3.980	1.620	2.350	3.080	2.950	4.240
SD	0.526	0.474	0.528	0.496	0.487	1.065	0.666	1.158	2.510

Note. N = 272, ** is $p < 0.01$, * is $p < 0.05$. Edu = Education, WS = Working seniority, Ind = Industry, SD = Standard deviation.

Procedure

This study received ethical approval from the Ethics Committee of Xiangtan University (Approval Number: 20240201). All participants informed consent prior to participation. Using a two-wave longitudinal design with a one-week interval, we first collected data on playful climate and control variables (Time 1), followed by measures of playful work design, flow, and employee creativity (Time 2). The survey was implemented via the Credamo online research platform.

Data analysis

We conducted the analysis using MPLUS 8.3 and SPSS 25.0. First, we performed confirmatory factor analysis and tested common method variance. Second, we applied hierarchical regression analysis and bootstrapping analysis to test our hypotheses.

Confirmatory factor analysis

Confirmatory factor analysis (CFA) was conducted using Mplus 8.3 to examine discriminant validity. As presented in Table 1, the hypothesized four-factor model demonstrated superior fit to the data (X^2/df = 2.076, RMSEA = 0.065, CFI = 0.923, TLI = 0.91, SRMR = 0.025) compared with alternative models, thereby supporting the discriminant validity of the four constructs.

Common method variance testing

Given that all measures (playful work design, flow, employee creativity, and playful climate) were collected

through self-report questionnaires, we performed Harman's single-factor test using SPSS 25.0 to examine potential common method variance (CMV). Principal component analysis without rotation indicated that the first factor explained 33.27% of the total variance, below the recommended 40% threshold (Podsakoff et al., 2003), suggesting that common method bias was not a substantial concern in this study.

Results

Descriptive statistics and correlation analysis

Table 2 presents the means, standard deviations, and correlations of the study variables. Playful work design is positively correlated with flow ($\gamma = 0.539$, $p < 0.01$) and employee creativity ($\gamma = 0.623$, $p < 0.01$). Employee creativity is positively correlated with flow ($\gamma = 0.540$, $p < 0.01$). The correlations among the main variables provided initial support for the theoretical model.

Hypotheses testing

We employed hierarchical regression analysis to test the hypotheses. The results are presented in Table 3. As shown in Table 3, playful work design is positively related to employee creativity ($\beta = 0.804$, $p < 0.001$, Model 2), thus confirming **H1**. Additionally, playful work design is positively associated to flow ($\beta = 0.633$, $p < 0.001$, Model 4), which supports **H2**. Model 3 (which controls for playful work design), examines the impact of flow on employee creativity. The results indicate that, compared to Model 2, the regression coefficient for the effect of playful

Table 3. Results of hierarchical regression analysis

Predictors	EC				Flow
	Model 1	Model 2	Model 3	Model 4	Model 5
PWD		0.804***	0.610***	0.633***	0.227***
Flow			0.307***		
PC					0.192***
PWD*PC					0.030*
Control variables					
Gender	-0.114	-0.052	-0.046	-0.020	-0.021
Age	0.024	-0.010	-0.013	0.011	0.005
Edu	-0.024	0.002	0.007	-0.032	-0.046
WS	0.116**	0.041	0.028	0.043	0.033
Ind	-0.006	0.013*	0.013*	-0.001	0.002
R^2	0.137	0.692	0.726	0.562	0.624
$\triangle R^2$	0.117	0.684	0.717	0.550	0.611
F	6.99***	84.84***	86.89***	48.39***	48.31***

Note. N = 272, ***is $p < 0.001$, **is $p < 0.01$, *is $p < 0.05$. PWD = Playful work design, EC = Employee creativity, PC = Playful climate.
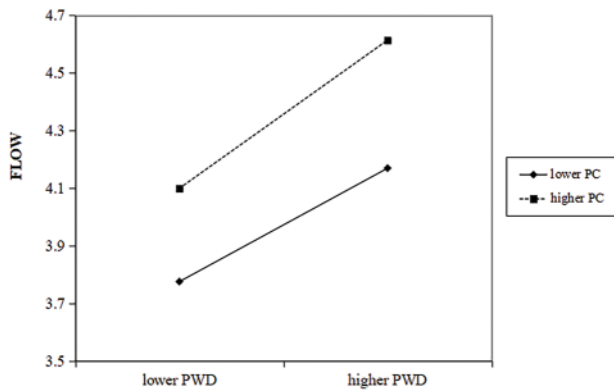
Figure 2. The moderation effect of PC on the relationship between PWD and Flow

work design on employee creativity decreases ($\beta = 0.610$, $p < 0.001$, in Model 3), while the coefficient for the effect of flow on employee creativity is significantly positive ($\beta = 0.307$, $p < 0.001$, in Model 3). These findings indicate that flow partially mediates the relationship between playful work design and employee creativity, thereby supporting **H3.**

The interaction between playful work design and playful climate has a significant positive effect on flow ($\beta = 0.030$, $p < 0.05$, Model 5), supporting **H4**. Furthermore, Figure 2 illustrates that when playful climate is high (+1 SD), the positive relationship between playful work design and flow is stronger compared to when playful climate is low (−1 SD). This indicates that a higher playful climate enhances the positive effect of playful work design on flow.

Furthermore, we used Hayes's (2017) SPSS macro PROCESS to test the moderated mediation effect through bias-corrected bootstrapping. This analysis estimated the conditional indirect effects of the predictor on the outcome via the mediator at low (mean −1 SD) and high (mean +1 SD) levels of the moderator. As shown in Table 4, the indirect effect of playful work design on employee

creativity through flow was insignificant under low playful climate (effect = −0.014, 95% CI [−0.170, 0.088], including zero). However, under high playful climate, this indirect effect became significant (effect = 0.182, 95% CI [0.053, 0.404], excluding zero). The index of moderated mediation was also significant (effect = 0.084, 95% CI [0.032, 0.138], excluding zero). These results confirm that playful climate significantly moderates the indirect effect of playful work design on employee creativity through flow, thereby supporting **H5**.

Discussion
First, playful work design was positively associated with employee creativity, aligning with prior research (Bakker et al., 2020b; Scharp et al., 2019). This relationship can be explained through the lens of basic psychological needs: By incorporating enjoyable tasks or competitive elements, playful work design fulfills employees' needs for autonomy, relatedness, and competence, thereby increasing work engagement and fostering employees' creativity.

Second, playful work design indirectly enhanced employees' creativity through flow. This finding can be explained by the fact that during the execution of playful work tasks, the generation of flow allows employees to maintain a psychological connection with the tasks enabling them to immerse themselves wholeheartedly in the work (Rich, et al., 2010). Moreover, employees who derive enjoyment from their work are more likely to concentrate on their tasks, leading to better creative performance (Fluegge-Woolf, 2014).

Third, playful climate moderated both the relationship between playful work design and flow and the indirect positive effect of playful work design on employee creativity through flow. Specifically, a stronger playful climate amplified the positive influence of playful work design on flow, resulting in higher creativity. These findings echo Yu et al.'s (2003) conclusion that in work environments with strong playful climates, employees gradually develop tacit understanding through spontaneous and

Table 4. Results of bootstrapping analysis

PC	PWD→Flow→EC			
	95% confidence interval			
	Effect	**BootSE**	**BootLLCI**	**BootULCI**
Low level	−0.014	0.064	−0.170	0.088
High level	0.182	0.087	0.053	0.404
Index of moderated mediation	0.084	0.027	0.024	0.138

Note. N = 272, CI = Confidence interval; LL = Lower limit; UL = Upper limit; The high\low levels are the mean ± one SD. PWD = Playful work design, EC = Employee creativity, PC = Playful climate.

casual exchanges—such as light-hearted jokes or leisurely games—which promote both physical/mental relaxation and enhanced creativity.

Contributions to theory and practice

This study makes significant contributions to existing theories in multiple dimensions. First, it extends the application of flow theory to research on playful work design. The findings reveal that playful work design provides a novel perspective for stimulating employee creativity. Acting as a partial mediator between playful work design and creativity, flow effectively transmits the positive influence of playful work design.

Second, by integrating flow theory with self-determination theory, the findings suggest that an organization's playful climate acts as a boundary condition for the relationship between playful work design and employee creativity. Specifically, in organizations with a strong playful climate, the positive impact of playful work design on employee creativity becomes more pronounced, and flow's mediating role is more significant. Simultaneously, it broadens the scope of application of the self-determination theory within the realm of organizational management.

Regarding practical implications, managers should attach importance to personalized task models that foster flow experiences at work, thereby enhancing employee creativity. Organizations should grant employees a degree of autonomy in their work to stimulate creative thinking among employees. Therefore, in recruiting and selecting employees for positions that demand high creativity (e.g., product design, advertising design, technical research and development, copywriting, marketing, etc.), managers can assess candidates' playful thinking patterns and work styles through resume screening, interviews, and other selection processes.

Organizations should actively cultivate a playful climate. We recommend integrating playful management philosophies by: (a) creating relaxed and enjoyable work environments; (b) establishing cultures that tolerate mistakes and encourage risk-taking; and (c) promoting openness and inclusiveness.

Lastly, organizations should focus on enhancing employees' job experiences, monitoring their work states, and helping them develop the ability to engage in playful work design. The secret to stimulating employee creativity through a playful work climate lies in the fact that a relaxed and enjoyable work environment can evoke positive emotions, leading employees into a state of flow. Training initiatives (or programs) should be combined with goal-setting and coaching to help employees discover game-like features in their work tasks and implement new work design strategies in their daily practices, thereby stimulating their bottom-up proactiveness.

Limitations and future studies

Firstly, all variables in this study are based on self-reports, which may lead to CMV. Although the Harman single-factor test confirmed that CMV is within an acceptable range, future research should consider using cross-level analyses to eliminate potential issues caused by CMV. Secondly, flow only partially mediates the relationship between playful work design and employee creativity, indicating that there is still considerable unexplored territory in the mechanism between the two. Future research could consider other potential mediating variables to explore the influence mechanism of playful work design on employee creativity. Lastly, it must be acknowledged that not all jobs are suitable for playful work design. Future in-depth investigations could focus on specific industrial sectors.

Conclusions

This study constructs a moderated mediation model to provide a comprehensive understanding of the relationship between playful work design and employee creativity, with flow serving as the mediator and playful climate as the moderator. The results indicate: (a) playful work design directly and positively affects employee creativity. (b) playful work design indirectly and positively affects employee creativity through flow. (c) Playful climate positively moderates the relationship of playful work design and flow. (d) Playful climate positively moderates the mediating effect of flow on the relationship between playful work design and employee creativity. This study extends the theoretical framework of antecedents of employee creativity from a new perspective and expands the literature that applies games to the workplace.

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Availability of Data and Materials: The datasets generated for this study are available on request to the corresponding author.

Ethics Approval: Not applicable.

Conflicts of Interest: The authors declare no conflicts of interest to report regarding the present study.

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