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Human-AI Collaboration and Employee Creativity: A Dual-Pathway Perspective of Challenge and Hindrance Stressors

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Abstract: Artificial intelligence (AI) is now widely used in the workplace. As a result, human–AI collaboration plays an increasingly important role in employee creativity. However, the psychological mechanisms underlying this relationship remain insufficiently understood. Drawing on the Challenge–Hindrance Stressor Framework and Organizational Support Theory, this study examines the mediating roles of challenge and hindrance stressors in the relationship between human–AI collaboration and employee creativity. It also investigates the moderating role of perceived organizational support. Survey data were collected from 292 Chinese employees with human–AI collaboration experience and analyzed using SPSS 27.0, AMOS 24.0, and the PROCESS macro. The results show that challenge stressors significantly mediate the positive relationship between human–AI collaboration and employee creativity. Hindrance stressors also exhibit a significant indirect effect; however, the effect is positive, contrary to the hypothesized negative direction. In addition, perceived organizational support strengthens the positive relationship between challenge stressors and employee creativity. Overall, these findings further clarify the psychological mechanisms through which human–AI collaboration influences employee creativity and highlight the important role of organizational support in strengthening the positive effect of challenge stressors on Employee creativity.

Keywords: Human–AI Collaboration; Challenge Stressors; Hindrance Stressors; Perceived Organizational Support; Employee Creativity

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1. Introduction

Artificial intelligence (AI) is now an essential part of modern organizations. It is widely used in knowledge work, decision-making, and daily business tasks. As a result, human–AI collaboration has become a standard work practice (Wang et al., 2026). This collaboration includes task sharing, information exchange, and joint problem-solving (Jarrahi, 2018). In this setup, AI is not just a passive tool. It acts as an active partner that shapes employee cognition, behavior, and work experiences (Raisch & Krakowski, 2021). Therefore, researchers need to understand how human–AI collaboration impacts employee creativity.

Previous studies have linked human–AI collaboration to employee creativity, but the underlying mechanisms remain unclear.

Although prior research has highlighted the resource-enhancing role of AI in facilitating employee creativity, relatively less attention has been paid to the stress processes arising from the new job demands associated with human–AI collaboration (Hitsuwari et al., 2023; Mahmud et al., 2023). Working with AI requires employees to learn new systems, change their routines, and coordinate with AI tools. These demands may generate significant stress (Hemmer et al., 2025). Under the Challenge–Hindrance Stressor Framework, these demands can be distinguished as challenge and hindrance stressors: challenge stressors provide opportunities for personal growth and goal attainment, whereas hindrance stressors constrain goal achievement and consume personal resources (Podsakoff et al., 2007). Thus, examining both types of stressors helps explain how human–AI collaboration affects Employee creativity. The impact of these stressors may also depend on organizational support. According to Organizational Support Theory, supportive organizations value employee contributions and care about their well-being. In turn, employees receive vital resources to handle workplace demands (Rhoades & Eisenberger, 2002). In AI-driven settings, perceived organizational support helps employees manage new pressures and shapes their creative output. Yet, few studies have tested the role of organizational support in human–AI collaboration.

To bridge these gaps, this study combines the Challenge–Hindrance Stressor Framework with Organizational Support Theory. We examine how challenge and hindrance stressors mediate the link between human–AI collaboration and employee creativity. We also test perceived organizational support as a moderator. By focusing on stress processes, this study clarifies how and when human–AI collaboration affects employee creativity. Finally, it offers practical insights for organizations using AI to boost innovation.

2. Theory and Hypotheses

2.1 Human–AI Collaboration and Employee Creativity

Human–AI collaboration describes a partnership where employees and artificial intelligence (AI) systems solve problems and complete tasks together (Lai et al., 2021). It goes beyond simple task automation. Instead, it relies on continuous information exchange, close task coordination, and joint decision-making. This collaboration combines human expertise and judgment with AI data processing and reasoning. As a result, it creates complementary strengths that boost both work efficiency and task performance (Jarrahi, 2018).

Employee creativity means generating novel and useful ideas, products, or procedures (Amabile, 1988). It is a vital source of organizational innovation and competitive advantage. Human–AI collaboration provides essential resources to support this creativity. First, AI rapidly processes large amounts of data. It provides employees with diverse knowledge, fresh perspectives, and alternative solutions (Jarrahi, 2018; Raisch & Krakowski, 2021). This input helps employees break through cognitive limits and approach problems from new angles (Hitsuwari et al., 2023). For complex tasks, AI-generated suggestions give employees extra cognitive support to develop innovative ideas. Second, AI handles routine tasks like data search, file organization, and basic text drafting (Benbya et al., 2020; Noy & Zhang, 2023). This automation saves valuable time and energy. Consequently, employees can focus their cognitive resources on in-depth analysis, idea generation, and creative work (Noy & Zhang, 2023). In addition, AI offers instant feedback and alternative options. Employees can quickly compare, refine, and upgrade their ideas during the process. Through this interaction, employees work more efficiently and discover creative problem-solving methods (Hitsuwari et al., 2023). In short, human–AI collaboration equips employees with the knowledge, cognitive capacity, and time needed to boost creativity. Based on these points, this study proposes:

Hypothesis 1: Human–AI collaboration positively influences employee creativity.

2.2 Human–AI Collaboration, Challenge Stressors and Hindrance Stressors

According to the Challenge–Hindrance Stressor Framework, job demands are neither purely positive nor negative (Cavanaugh et al., 2000; LePine, 2022). As generative AI enters daily work routines, human–AI collaboration introduces new job demands that may function as either challenge or hindrance stressors. On the one hand, AI takes over repetitive tasks. This allows employees to focus more on complex problem-solving and creative work (Jia et al., 2024). In addition, working with AI pushes employees to learn new skills and gain new knowledge. These AI-related demands may function as challenge stressors because they create opportunities for employees to develop new skills, acquire knowledge, and achieve work-related growth. On the other hand, human–AI collaboration can also trigger hindrance stressors. Rapid advances in AI require new

skills like critical thinking, creative problem-solving, and data analysis. These requirements increase work complexity and adaptation demands (Garcia Martinez, 2017). At the same time, AI-related demands may function as hindrance stressors when technological complexity, adaptation requirements, and uncertainty interfere with employees' goal attainment and consume their limited resources (LePine et al., 2005).

Overall, human–AI collaboration can generate job demands with different characteristics. Specifically, demands that offer opportunities for learning, skill development, and growth may function as challenge stressors, whereas demands that increase work complexity, impede goal attainment, and consume employees' resources may function as hindrance stressors. Therefore, human–AI collaboration may simultaneously increase both challenge and hindrance stressors. Based on these arguments, this study proposes the following hypotheses:

Hypothesis 2a: Human–AI collaboration positively influences employees' challenge stressors.

Hypothesis 2b: Human–AI collaboration positively influences employees' hindrance stressors.

2.3 Challenge and Hindrance Stressors and Employee Creativity

Challenge stressors are work demands that involve opportunities for learning, growth, and goal attainment. Such demands encourage employees to invest greater effort and cognitive resources in complex tasks and to explore new knowledge, methods, and solutions (Zhang & Xiao, 2016). This active engagement can help employees move beyond conventional approaches and consider problems from different perspectives, thereby facilitating the generation of novel and useful ideas (Sacramento et al., 2013). Therefore, challenge stressors are expected to enhance employee creativity.

In contrast, hindrance stressors are work demands that obstruct goal attainment and consume employees' limited resources. When employees devote substantial time and cognitive resources to dealing with obstacles and constraints, fewer resources remain available for exploration and creative activities (Ren & Zhang, 2015). Such resource depletion may also discourage employees from experimenting with uncertain alternatives, leading them to rely more on familiar and established approaches. Consequently, opportunities for generating novel ideas are reduced. Therefore, hindrance stressors are expected to reduce employee creativity.

Hypothesis 3a: Challenge stressors positively influence employee creativity.

Hypothesis 3b: Hindrance stressors negatively influence employee creativity.

2.4 The Mediating Role of Challenge and Hindrance Stressors

Based on these arguments, challenge and hindrance stressors represent two distinct psychological pathways linking human–AI collaboration to employee creativity. Human–AI collaboration changes how employees work and introduces new job demands that require employees to invest cognitive and motivational resources. When AI-related demands act as challenge stressors, employees actively mobilize cognitive and motivational resources. They make better use of collaborative AI tools, turning technical advantages into innovative outcomes. Therefore, challenge stressors serve as a key mechanism that promotes employee creativity. In contrast, human–AI collaboration does not always boost creativity. Adapting to evolving AI tools requires constant effort. This ongoing pressure consumes valuable psychological and cognitive resources (Tarafdar et al., 2007). When AI-related demands act as hindrance stressors, employees spend limited resources dealing with obstacles instead of exploring new ideas. In this case, hindrance stressors create a resource-draining pathway that constrains creativity. In short, human–AI collaboration influences employee creativity through two distinct stressor mechanisms. This study proposes:

Hypothesis 4a: Challenge stressors positively mediate the relationship between human–AI collaboration and employee creativity.

Hypothesis 4b: Hindrance stressors negatively mediate the relationship between human–AI collaboration and employee creativity.

2.5 The Moderating Role of Perceived Organizational Support

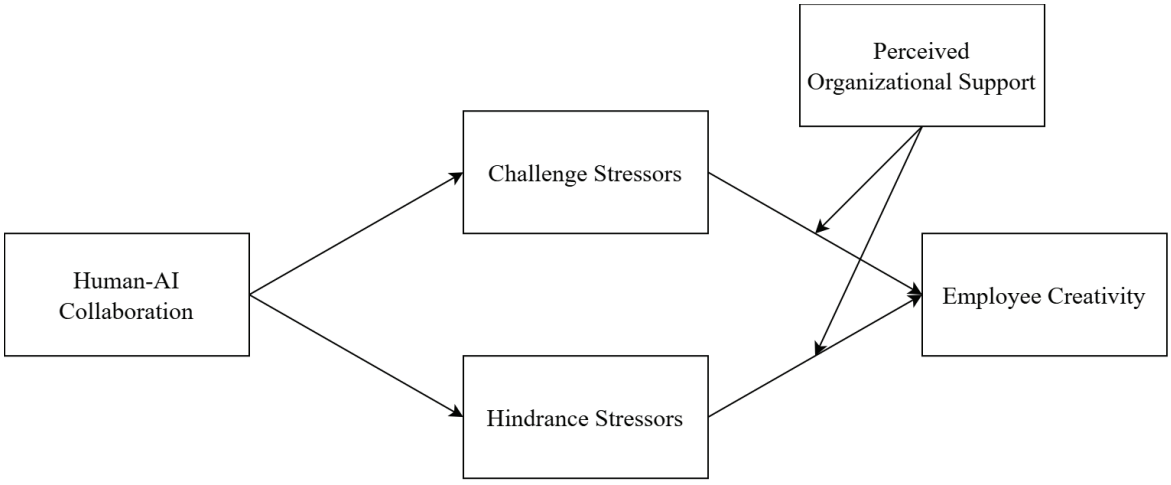
Perceived Organizational Support (POS) refers to employees' general belief that their organization values their contributions and cares about their well-being (Eisenberger et al., 1986; Kurtessis et al., 2017). According to Organizational Support Theory, employees with higher POS are more likely to receive the resources and psychological support needed to deal with job demands and are more willing to invest effort in achieving work goals (Rhoades & Eisenberger, 2002). For challenge

stressors, higher POS can strengthen employees' confidence in dealing with challenging demands and increase their belief that their efforts and creative attempts will be recognized and supported by the organization (Eisenberger et al., 1990). Under these conditions, employees are more willing to invest the motivation generated by challenge stressors in learning, exploration, and idea generation. Therefore, higher POS is expected to strengthen the positive relationship between challenge stressors and employee creativity. For hindrance stressors, higher POS can provide employees with the resources and psychological support needed to deal with work-related obstacles. When employees face constraints and difficulties at work, organizational support can help reduce resource loss and encourage them to actively address these problems(Kurtessis et al., 2017). Thus, even when employees experience high hindrance stressors, greater POS can reduce its negative effect on creative activities and buffer the negative relationship between hindrance stressors and employee creativity. Based on the above arguments, this study proposes the following hypotheses:

Hypothesis 5a: Perceived organizational support moderates the relationship between challenge stressors and employee creativity, such that the positive relationship is stronger when perceived organizational support is higher.

Hypothesis 5b: Perceived organizational support moderates the relationship between hindrance stressors and employee creativity, such that the negative relationship is weaker when perceived organizational support is higher.

Figure 1. Research model.



3. Methods

3.1. Sample and Procedures

This study targeted Chinese employees with experience in human–AI collaboration. Data were collected through an online survey administered via Wenjuanxing between May 17 and May 31, 2026. All variables were measured using self-reported questionnaires. A total of 322 responses were collected. After excluding incomplete and invalid responses, 292 valid questionnaires were retained and used for the final analysis.

The final sample consisted of 292 respondents. Of these, 149 (51.0%) were male and 143 (49.0%) were female. Regarding age, the largest proportion of respondents were between 30 and 40 years old (46.2%), followed by those between 20 and 30 years old (31.8%). In terms of educational attainment, 40.1% held a bachelor's degree, followed by junior or associate college graduates (28.1%) and graduate degree holders (16.8%). Most respondents (79.5%) had more than one year of organizational tenure. Regarding organizational position, staff employees constituted the largest group (53.1%), followed by assistant managers (28.1%) and managers (13.4%). In terms of job function, respondents were primarily engaged in administrative/managerial work (29.5%), research and development (19.2%), sales (18.5%), and production/technical work (18.8%). Slightly more than half of the respondents were non-regular employees (51.7%), while 48.3% were regular employees. The respondents represented a range of industries, with financial services (24.3%), manufacturing (18.5%), and service industries (17.1%) accounting for the largest proportions.

3.2 Measures

3.2.1 Human–AI Collaboration

Human–AI collaboration refers to employees' collaborative engagement with AI systems in carrying out work-related tasks. The construct was assessed using the scale developed by Kong et al. (2023), which demonstrated good internal consistency in the present study, with a Cronbach's α of .894.

3.2.2 Challenge Stressors

Challenge stressors are defined as work-related stressors that may contribute to positive work outcomes through specific mechanisms in the workplace (Boswell et al., 2004). Six items adapted from Cavanaugh et al. (2000) were used to measure challenge stressors. The scale demonstrated satisfactory internal consistency, with a Cronbach's α of .874.

3.2.3 Hindrance Stressors

Hindrance stressors refer to work-related demands that individuals perceive as difficult to manage or beyond their coping capacity, thereby constraining effective functioning at work (Cavanaugh et al., 2000). Hindrance stressors were measured using five items adapted from Cavanaugh et al. (2000). The scale exhibited good internal consistency, with a Cronbach's α of .859.

3.2.4 Perceived Organizational Support

Perceived organizational support (POS) refers to employees' general perception that the organization values their contributions and cares about their well-being (Eisenberger et al., 1997). POS was measured using the scale developed by Eisenberger et al. (1997). The scale demonstrated excellent internal consistency, with a Cronbach's α of .883.

3.2.5 Employee Creativity

Employee Creativity refers to the generation of novel and useful ideas related to methods, processes, products, or services. It was assessed using four items derived from Farmer et al.'s (2003) measure. The four-item scale showed good internal consistency, with a Cronbach's α of .789.

3.2.6 Control Variables

The control variables were selected based on prior research examining factors that may influence employee creativity. Previous research has suggested that demographic and work-related characteristics, such as age, education level, organizational tenure, and job position, may be associated with employee creativity (Shalley et al., 2004). In addition, creativity may vary across employment status, job functions, and industries due to differences in work characteristics and task environments. Therefore, age, education level, organizational tenure, job position, employment status, job function, and industry were included as control variables. Gender was also controlled for, as previous research suggests that individual work behaviors may differ by gender.

4. Results

4.1 Descriptive Statistics and Correlations among the Study Variables

Table 1 presents the descriptive statistics and intercorrelations among the study variables. Human–AI collaboration was positively correlated with challenge stressors ($r = 0.420$, $p < 0.001$), hindrance stressors ($r = 0.253$, $p < 0.001$), creativity ($r = 0.449$, $p < 0.001$), and perceived organizational support ($r = 0.318$, $p < 0.001$). Challenge stressors were positively correlated with hindrance stressors ($r = 0.291$, $p < 0.001$), creativity ($r = 0.502$, $p < 0.001$), and perceived organizational support ($r = 0.238$, $p < 0.001$). Hindrance stressors were positively correlated with employee creativity ($r = 0.393$, $p < 0.001$) and perceived organizational support ($r = 0.330$, $p < 0.001$). In addition, employee creativity was positively correlated with perceived organizational support ($r = 0.443$, $p < 0.001$). Overall, the correlations provided preliminary evidence of significant relationships among the study variables.

Table 1. Descriptive Statistics and Correlations Among the Study Variables

Variable	Mean	S.D.	1	2	3	4	5
1.Human–AI Collaboration	3.576	0.970	1				
2.Challenge Stressors	3.953	0.790	0.420**	1			
3.Hindrance Stressors	3.636	0.877	0.253**	0.291**	1		
4.Employee Creativity	3.821	0.782	0.449**	0.502**	0.393**	1	
5.Perceived Organizational Support	4.037	0.722	0.318**	0.238**	0.330**	0.443**	1

N = 292, *: $p < 0.01$, **: $p < 0.001$

4.2 Confirmatory Factor Analysis

Table 2 presents the results of the confirmatory factor analysis (CFA). The hypothesized five-factor model demonstrated a good fit to the data ($\chi^2 = 367.871$, df = 340, $\chi^2/df = 1.082$, GFI = 0.918, CFI = 0.992, TLI = 0.992, RMSEA = 0.017, RMR = 0.045) and showed a substantially better fit than the alternative models, supporting the discriminant validity of the five study constructs.

Table 2. Comparison of Alternative Measurement Models

Model	χ^2	df	χ^2/df	GFI	CFI	TLI	RMSEA	RMR
AI / CH / HI / CRE / POS	367.871	340	1.082	0.918	0.992	0.992	0.017	0.045
AI / CH+HI / CRE / POS	888.842	344	2.584	0.764	0.852	0.837	0.074	0.101
AI / CH+HI+CRE / POS	1048.061	347	3.020	0.723	0.809	0.792	0.083	0.100
AI+CH+HI+CRE / POS	1514.999	349	4.341	0.636	0.683	0.656	0.107	0.120
AI+CH+HI+CRE+POS	2121.431	350	6.061	0.526	0.518	0.479	0.132	0.142

AI: Human–AI Collaboration; CH: Challenge Stressors; HI: Hindrance Stressors; CRE: Employee Creativity; POS: Perceived Organizational Support.

4.3 Hypothesis Testing

Before testing the hypotheses, Harman's single-factor test was conducted to assess potential common method bias. The results showed that the first unrotated factor accounted for 30.089% of the total variance, which was below the commonly used threshold of 50%. Thus, no substantial common method bias was indicated.

In addition, multicollinearity was assessed using tolerance and variance inflation factor (VIF) values. The results showed that all tolerance values were above .10, while the VIF values ranged from 1.103 to 1.534, all of which were below the recommended threshold of 10. Therefore, multicollinearity was not a serious concern in this study.

Hierarchical regression analyses were conducted to test the proposed hypotheses, with creativity as the dependent variable. As shown in Table 3, the control variables were entered in Model 1, followed sequentially by human–AI collaboration, challenge and hindrance stressors, perceived organizational support (POS), and the interaction terms.

Hypothesis 1 proposed that human–AI collaboration would be positively associated with employee creativity. As shown in Model 2, human–AI collaboration had a significant positive effect on employee creativity ($\beta = 0.425$, $p < 0.001$). The inclusion of human–AI collaboration substantially increased the explained variance ($\Delta R^2 = 0.175$, $p < 0.001$). Thus, Hypothesis 1 was supported.

Hypotheses 3a and 3b concerned the effects of challenge and hindrance stressors on employee creativity. As shown in Model 3, challenge stressors were positively and significantly associated with employee creativity ($\beta = 0.316$, $p < 0.001$), providing support for Hypothesis 3a. However, contrary to Hypothesis 3b, hindrance stressors were also positively associated with employee creativity ($\beta = 0.248$, $p < 0.001$), rather than negatively associated with creativity. Therefore, Hypothesis 3b was not supported.

Hypotheses 5a and 5b proposed the moderating effects of perceived organizational support. As shown in Model 5, the interaction between challenge stressors and POS was positive and statistically significant ($\beta = 0.096$, $p < 0.05$), indicating that POS strengthened the positive relationship between challenge stressors and employee creativity. Thus, Hypothesis 5a was supported. In contrast, the interaction between hindrance stressors and POS was not statistically significant ($\beta = 0.018$, $p > 0.05$). Therefore, there was no evidence that POS buffered the relationship between hindrance stressors and employee creativity, and Hypothesis 5b was not supported.

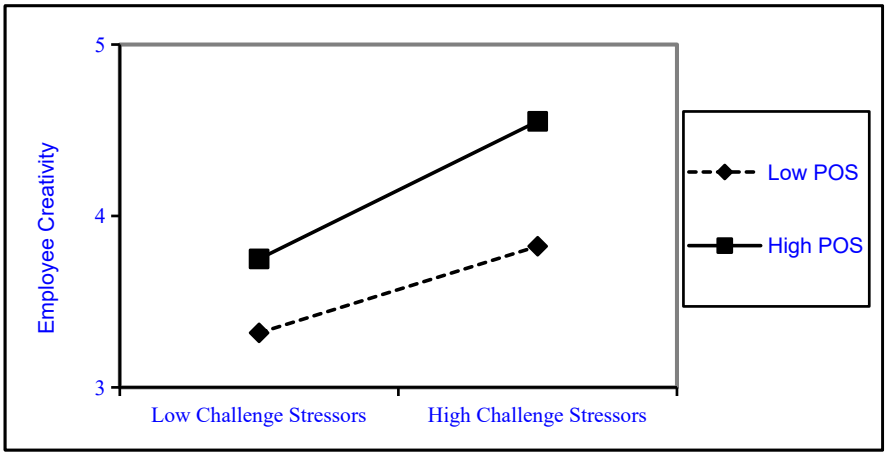
Table 3. Results of Hierarchical Regression Analyses for Employee Creativity

Variable	Employee Creativity				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
1.Age	-0.191**	-0.148**	-0.143**	-0.142**	-0.135**
2.Gender	0.040	0.028	0.028	0.042	0.031
3.Tenure	0.078	0.097	0.094*	0.098*	0.090*
4.Education	0.001	0.016	0.043	0.017	0.023
5.Position	0.069	0.027	0.017	0.035	0.033
6.Job Function	0.052	0.056	0.039	0.032	0.034
7.Employment Type	-0.205**	-0.142**	-0.141**	-0.161**	-0.159**
8.Industry	-0.050	-0.045	0.020	0.024	0.024
9.Human–AI Collaboration		0.425***	0.230***	0.171***	0.170***
10.Challenge Stressors(a)			0.316***	0.297***	0.314***
11.Hindrance Stressors(b)			0.248***	0.182***	0.178***
12.POS(c)				0.258***	0.258***
13.a * c					0.096*
14.b * c					0.018
F	2.883**	10.467***	18.021***	20.499***	18.095***
R^2	0.075	0.250	0.415	0.469	0.478
ΔR^2		0.175***	0.164***	0.054***	0.009*

N = 292, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

To further examine how perceived organizational support moderates the relationship between challenge stressors and creativity, the interaction effect was plotted at high and low levels of POS, as shown in Figure 2. The results indicate that the positive relationship between challenge stressors and employee creativity was stronger when POS was high than when POS was low. This pattern further supports Hypothesis 5a, suggesting that perceived organizational support strengthens the positive effect of challenge stressors on employee creativity.

Figure 2. Moderating Effect of POS on Employee Creativity.



Hypotheses 2a and 2b proposed that human–AI collaboration would be positively associated with challenge stressors and hindrance stressors, respectively. As shown in Table 4, after controlling for demographic and job-related variables, human–AI collaboration had a significant positive effect on challenge stressors (Model 2; $\beta = 0.258$, $p < 0.001$), explaining an additional

6.5% of the variance ($\Delta R^2 = 0.065$, $p < 0.001$). Therefore, Hypothesis 2a was supported. Similarly, human–AI collaboration had a significant positive effect on hindrance stressors (Model 4; $\beta = 0.412$, $p < 0.001$), with an additional 16.5% of the variance explained ($\Delta R^2 = 0.165$, $p < 0.001$). Thus, Hypothesis 2b was also supported.

Table 4. Results of hierarchical regression analyses

Variable	Challenge Stressors		Hindrance Stressors	
	Model 1	Model 2	Model 3	Model 4
1.Age	0.072	0.099	-0.135*	-0.094
2.Gender	-0.001	-0.008	0.017	0.005
3.Tenure	-0.047	-0.036	0.021	0.040
4.Education	0.001	0.010	-0.108	-0.094
5.Position	-0.031	-0.056	0.116	0.075
6.Job Function	0.002	0.004	0.047	0.051
7.Employment Type	-0.039	0.001	-0.063	-0.001
8.Industry	-0.182**	-0.179**	-0.07	-0.066
9.Human-AI Collaboration		0.258***		0.412***
F	1.595	3.793***	1.028	7.507***
R^2	0.043	0.108	0.028	0.193
ΔR^2		0.065***		0.165***

N = 292, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

Finally, the mediating effects of challenge and hindrance stressors were examined using bootstrapping analysis. As shown in Table 5, the indirect effect of human–AI collaboration on creativity through challenge stressors was positive and significant (indirect effect = 0.1052, BootSE = 0.0221, 95% BC CI [0.0651, 0.1516]). Because the confidence interval did not include zero, the mediating effect of challenge stressors was significant. Thus, Hypothesis 4a was supported. The indirect effect of human–AI collaboration on employee creativity through hindrance stressors was also positive and significant (indirect effect = 0.0517, BootSE = 0.0150, 95% BC CI [0.0247, 0.0835]). Although the indirect effect was statistically significant, its direction was positive rather than the hypothesized negative direction. Therefore, Hypothesis 4b was not supported.

Table 5. Mediating Effect Bootstrapping Results

The mediation path (Indirect effect)	Effect	BootSE	BC 95% Confidence Interval	
			BootLLCI	BootULCI
Human-AI Collaboration → Challenge Stressors → Employee Creativity	0.1052	0.0221	0.0651	0.1516
Human-AI Collaboration → Hindrance Stressors → Employee Creativity	0.0517	0.0150	0.0247	0.0835

5. Discussion

5.1 Overall Findings

This study uses the Challenge–Hindrance Stressor Framework and Organizational Support Theory to explain how human–AI collaboration affects employee creativity. The results indicate that human–AI collaboration directly improves employee creativity. At the same time, it increases both challenge and hindrance stressors. Challenge stressors positively influenced employee creativity. They also partially mediated the relationship between human–AI collaboration and employee creativity. In contrast, hindrance stressors showed an unexpected positive link to employee creativity. Therefore, our hypothesis regarding a negative effect and negative mediation was not supported. Finally, perceived organizational support (POS)

strengthened the positive link between challenge stressors and employee creativity. However, POS did not moderate the relationship between hindrance stressors and employee creativity.

Human–AI collaboration significantly enhances employee creativity while also increasing both challenge and hindrance stressors. These findings are consistent with prior research showing that AI enhances information processing, problem-solving, and innovation (Jarrahi, 2018; Raisch & Krakowski, 2021). At the same time, working with AI requires employees to learn new systems and adjust their work routines, creating additional job demands. Thus, this study extends the Challenge–Hindrance Stressor Framework to the context of human–AI collaboration.

Furthermore, challenge stressors significantly enhanced employee creativity and mediated the relationship between human–AI collaboration and employee creativity. This finding is consistent with previous research (LePine et al., 2005; Sacramento et al., 2013). In AI-driven work environments, employees must continuously learn new tools and explore new ways of working. Although these demands may increase work pressure, they can provide opportunities for learning and growth, thereby stimulating exploration and creative problem-solving. Thus, human–AI collaboration may enhance employee creativity through challenge stressors.

Interestingly, contrary to the proposed hypothesis, hindrance stressors were positively related to employee creativity. Therefore, the hypothesized negative effect and corresponding mediating role were not supported. Prior research generally suggests that hindrance stressors negatively affect performance and innovation (LePine et al., 2005; Dou et al., 2022). One possible explanation is that, in human–AI collaboration, employees may need to develop alternative solutions to overcome technological uncertainty, learning difficulties, and role ambiguity. Thus, the positive relationship may reflect problem-driven creative responses to AI-related obstacles rather than a beneficial effect of hindrance stressors themselves. This unexpected finding suggests that the consequences of hindrance stressors for employee creativity may be more context-dependent in AI-enabled work.

Finally, perceived organizational support (POS) strengthened the positive relationship between challenge stressors and employee creativity. Organizational support provides employees with resources and psychological support, enabling them to transform challenging demands into learning, exploration, and creative behavior (Eisenberger et al., 1990; Kurtessis et al., 2017). In contrast, POS did not significantly moderate the relationship between hindrance stressors and employee creativity. General organizational support may not be sufficient to address AI-specific difficulties, such as technological complexity and human–AI coordination. More targeted resources, including AI training, technical support, and clear human–AI collaboration guidelines, may therefore be more effective.

5.2 Theoretical Implications and Practical Implications

This study offers several theoretical contributions. First, it extends research on human–AI collaboration and employee creativity. Prior studies mainly viewed AI as a tool for information access and problem-solving. This study shows that human-AI collaboration directly enhances creativity while creating challenge and hindrance stressors. Thus, AI functions as both a helpful resource and a source of new demands, uncovering a dual mechanism behind employee creativity.

Second, this study applies the Challenge–Hindrance Stressor Framework to AI-driven workplaces. Challenge stressors positively mediated the link between AI collaboration and creativity, supporting standard theory (LePine et al., 2005). Unexpectedly, the indirect effect through hindrance stressors was also positive, contrary to the hypothesized negative direction. In fast-changing digital environments, obstructive demands may prompt employees to rethink existing routines and develop alternative solutions.

Third, this study identifies perceived organizational support (POS) as a key boundary condition. POS strengthened the positive effect of challenge stressors on employee creativity. This shows that organizational backing helps employees convert difficult tasks into creative results. However, POS did not moderate the hindrance stressor path. Therefore, general support does not affect all stressors equally, showing the need to match specific resources to specific demands.

These findings also provide practical insights for managers. First, leaders must look beyond efficiency and manage the stress created by AI tools. Managers should design AI workflows that frame technical demands as learning and growth opportunities. Such practices may enhance the creative benefits of challenge stressors.

Second, companies must provide adequate organizational resources. Because POS boosts the positive impact of challenge stressors, leaders should offer continuous learning, management backing, and formal recognition for AI exploration. These resources help employees transform challenging demands into innovative outcomes.

Finally, managers must actively control hindrance stressors. Although hindrance stressors were positively linked to creativity here, organizations should not intentionally increase them. Instead, managers must resolve technical complexity, role ambiguity, and coordination bottlenecks. Providing targeted AI training, IT support, and clear guidelines reduces adaptation costs and builds a sustainable creative workplace.

5.3 Limitations and Future Research

Despite its contributions, this study has several limitations. First, all data came from self-reported surveys at a single point in time. This approach may introduce common method bias. The cross-sectional design also prevents strong causal conclusions. Future research should use multi-wave or longitudinal designs to track AI collaboration, stressors, and creativity over time. Researchers could also collect objective ratings, such as supervisor evaluations of employee creativity, to reduce measurement bias.

Second, the sample included only employees in China. This limits how well the findings apply to other national or cultural settings. Cultural differences often shape how employees perceive work stress, organizational support, and AI tools. Future studies should test these relationships across different countries and cultures to verify generalizability.

Third, this study treated human–AI collaboration as a single, general construct. It did not separate different types or depths of collaboration. In reality, voluntary AI adoption may trigger different stress levels compared to mandatory AI use. Future research should examine specific dimensions, such as collaboration intensity, task autonomy, and interaction modes, to provide a more nuanced picture.

Finally, the positive relationship between hindrance stressors and employee creativity contrasts with traditional theory. This unexpected outcome may stem from the unique dynamics of digital workplaces, but it needs further testing. Future research should explore potential boundary conditions, such as cognitive appraisal styles, AI literacy, and coping strategies, to clarify when hindrance stressors boost or harm employee creativity.

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